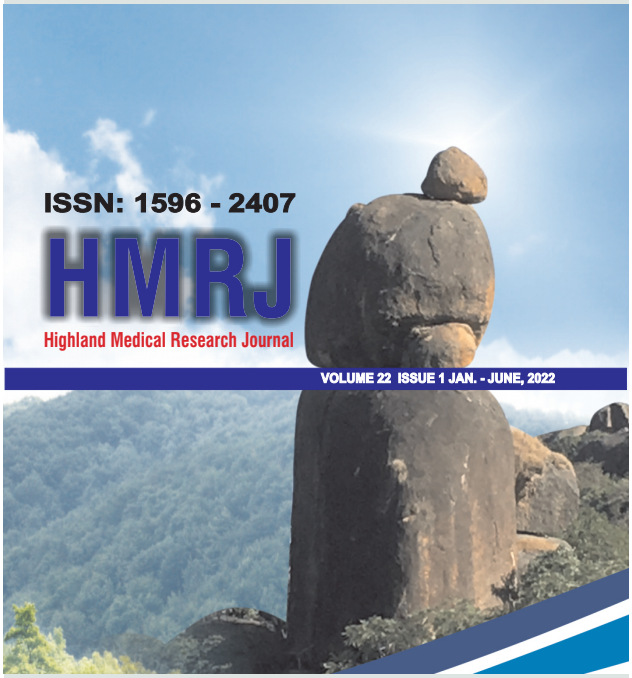
TABLE OF CONTENT

ORIGINAL ARTICLE

CASE REPORT



HMRJ
Highland Medical Research Journal

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EDITORIAL

COP27 Climate Change Conférence: urgent action needed for Africa and the world

Wealthy nations must step up support for Africa and vulnérable countries in addressing past, présent and future impacts of climate change

The 2022 report of the Intergovernmental Panel on Climate Change (IPCC) paints a dark picture of the future of life on earth, characterised by ecosystem collapse, species extinction, and climate hazards such as heatwaves and floods.[1] These are all linked to physical and mental health problems, with direct and indirect consequences of increased morbidity and mortality. To avoid these catastrophic health effects across all regions of the globe, there is broad agreement—as 231 health journals argued together in 2021—that the rise in global temperature must be limited to less than 1.5°C compared with pre-industrial levels.

While the Paris Agreement of 2015 outlines a global action framework that incorporates providing climate finance to developing countries, this support has yet to materialise.[2] COP27 is the fifth Conference of the Parties (COP) to be organised in Africa since its inception in 1995. Ahead of this meeting, we—as health journal editors from across the continent—call for urgent action to ensure it is the COP that finally delivers climate justice for Africa and vulnerable countries. This is essential not just for the health of those countries, but for the health of the whole world.

Africa has suffered disproportionately although it has done little to cause the crisis

The climate crisis has had an impact on the environmental and social determinants of health across Africa, leading to devastating health effects.[3] Impacts on health can result directly from environmental shocks and indirectly through socially mediated effects.[4] Climate change-related risks in Africa include flooding, drought, heatwaves, reduced food production, and reduced labour productivity.[5]

Droughts in sub-Saharan Africa have tripled between 1970-79 and 2010-2019 (6). In 2018, devastating cyclones impacted 2.2 million people in Malawi, Mozambique and Zimbabwe.[6] In west and central Africa, severe flooding resulted in mortality and forced migration from loss of shelter, cultivated land, and livestock.[7] Changes in vector ecology brought about by floods and damage to environmental hygiene have led to increases in diseases across sub-Saharan Africa, with rises in malaria, dengue fever, Lassa fever, Rift Valley fever, Lyme disease, Ebola virus, West Nile virus and other infections.[8,9] Rising sea levels reduce water quality, leading to water-borne diseases, including diarrhoeal diseases, a leading cause of mortality in Africa.[8] Extreme weather damages water and food supply, increasing food insecurity and malnutrition, which causes 1.7 million deaths annually in Africa.[10] According to the Food and Agriculture Organization of the United Nations, malnutrition has increased by almost 50% since 2012, owing to the central role agriculture plays in African economies.[11] Environmental shocks and their knock-on effects also cause severe harm to mental health.[12] In all, it is estimated that the climate crisis has destroyed a fifth of the gross domestic product (GDP) of the countries most vulnerable to climate shocks.[13]

The damage to Africa should be of supreme concern to all nations. This is partly for moral reasons. It is highly unjust that the most impacted nations have contributed the least to global cumulative emissions, which are driving the climate crisis and its increasingly severe effects. North America and Europe have contributed 62% of carbon dioxide emissions since the Industrial Revolution, whereas Africa has contributed only 3% .[14]

The fight against the climate crisis needs all hands on deck

Yet it is not just for moral reasons that all nations should be concerned for Africa. The acute and chronic impacts of the climate crisis create problems like poverty, infectious disease, forced migration, and conflict that spread through globalised systems.[6,15] These knock-on impacts affect all nations. COVID-19 served 1 as a wake-up call to these global dynamics and it is no coincidence that health professionals have been active in identifying and responding to the consequences of growing systemic risks to health. But the lessons of the COVID-19 pandemic should not be limited to pandemic risk.[16,17] Instead, it is imperative that the suffering of frontline nations, including those in Africa, be the core consideration at COP27: in an interconnected world, leaving countries to the mercy of environmental shocks creates instability that has severe consequences for all nations.

The primary focus of climate summits remains to rapidly reduce emissions so that global temperature rises are kept to below 1.5 °C. This will limit the harm. But, for Africa and other vulnerable regions, this harm is already severe. Achieving the promised target of providing $100bn of climate finance a year is now globally critical if we are to forestall the systemic risks of leaving societies in crisis. This can be done by ensuring these resources focus on increasing resilience to the existing and inevitable future impacts of the climate crisis, as well as on supporting vulnerable nations to reduce their greenhouse gas emissions: a parity of esteem between adaptation and mitigation. These resources should come through grants not loans, and be urgently scaled up before the current review period of 2025. They must put health system resilience at the forefront, as the compounding crises caused by the climate crisis often manifest in acute health problems. Financing adaptation will be more cost-effective than relying on disaster relief.

Some progress has been made on adaptation in Africa and around the world, including early warning systems and infrastructure to defend against extremes. But frontline nations are not compensated for impacts from a crisis they did not cause. This is not only unfair, but also drives the spiral of global destabilisation, as nations pour money into responding to disasters, but can no longer afford to pay for greater resilience or to reduce the root problem through emissions reductions. A financing facility for loss and damage must now be introduced, providing additional resources beyond those given for mitigation and adaptation. This must go beyond the failures of COP26 where the suggestion of such a facility was downgraded to "a dialogue".[18]

The climate crisis is a product of global inaction, and comes at great cost not only to disproportionately impacted African countries, but to the whole world. Africa is united with other frontline regions in urging wealthy nations to finally step up, if for no other reason than that the crises in

Africa will sooner rather than later spread and engulf all corners of the globe, by which time it may be too late to effectively respond. If so far they have failed to be persuaded by moral arguments, then hopefully their self-interest will now prevail.

Lukoye Atwoli, Editor-in-Chief, *East African Medical Journal*; Gregory E. Erhabor, Editor-in-Chief, *West African Journal of Medicine*; Aiah A. Gbakima, Editor-in-Chief, *Sierra Leone Journal of Biomedical Research*; Abraham Haileamlak, Editor-in-Chief, *Ethiopian Journal of Health Sciences*; Jean-Marie Kayembe Ntumba, Chief Editor, *Annales Africaines de Medecine*; James Kigera, Editor-in-Chief, *Annals of African Surgery*; Laurie Laybourn-Langton, University of Exeter; Bob Mash, Editor-in-Chief, *African Journal of Primary Health Care & Family Medicine*; Joy Muhia, London School of Medicine and Tropical Hygiene; Fhumulani Mavis Mulaudzi, Editor-in-Chief, *Curationis*; David Ofori-Adjei, Editor-in-Chief, *Ghana Medical Journal*; Friday Okonofua, Editor-in-Chief, *African Journal of Reproductive Health*; Arash Rashidian, Executive Editor, and Maha El-Adawy, Director of Health Promotion, *Eastern Mediterranean Health Journal*; Siaka Sidibé, Director of Publication, *Mali Médical*; Abdelmadjid Snouber, Managing Editor, *Journal de la Faculté de Médecine d'Oran*; James Tumwine, Editor-in-Chief, *African Health Sciences*; Mohammad Sahar Yassien, Editor-in-Chief, *Evidence-Based Nursing Research*; Paul Yonga, Managing Editor, *East African Medical Journal*; Lilia Zakhama, Editor-in-Chief, *La Tunisie Médicale*; Chris Zielinski, University of Winchester.
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This Comment is being published simultaneously in multiple journals. For the full list of journals see:
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ORIGINAL ARTICLE

Ectopic Pregnancy at a Tertiary Hospital in North Eastern Nigeria: A 2 Year Review of the Clinical Presentations and Management

Ejike S Nnamani, Calvin C Chama, Muhammad B Aminu, Shehu M Abubakar

Abstract

Background: Ectopic pregnancy is a life threatening gynaecological condition associated with adverse reproductive health consequences. It commonly implants in the fallopian tube and most patients in the developing world present late when it has ruptured leading to maternal morbidity and mortality if intervention is delayed.

Method: This was a descriptive cross-sectional retrospective study of patients with ectopic pregnancy managed at Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, North-east Nigeria between 1st January, 2013 and 31st December, 2014. Data on the age, parity, clinical symptoms and signs and the types of surgical treatment offered was extracted and computed using excel spreadsheet and statistical analysis was done using SPSS (version 23) and results presented as frequency tables, percentages, and mean (± SD).

Results: There were 1,577 gynaecological admissions during the period of study and 98 of them (6.2%) were ectopic pregnancies. The total number of deliveries during the same period was 6,738, putting the incidence of ectopic pregnancy to be 1.45% of all deliveries. Majority of the affected patients (39.2%) were between 25- 29 years with a mean and SD of 26.5 ± 4.9 years. Majority of the patients who had ectopic pregnancy 26 (35.1%) were nulliparous women. Of these patients, 97.3% presented with symptoms of abdominal pain, amenorrhoea (83.8%) and vaginal bleeding (68.9%). 97.3% of them had salpingectomy of the affected side.

Conclusion: Ectopic pregnancy is a common life-threatening emergency in early pregnancy. Efforts made to improve early diagnosis prior to tubal rupture, would help reduce the associated maternal morbidity and eliminate mortality from this condition.

Key words: Ectopic, Pregnancy, Fallopian Tube, Morbidity

Date received: 10 November 2021; accepted: 5 May 2022

Highland Med Res J 2022;22(1):1-5

Introduction

Ectopic pregnancy is defined as a gestation in which the fertilized ovum implants in an area other than the endometrial lining of the uterus.[1] It is a common gynaecological condition worldwide and a major public health issue that could significantly impact future reproductive potential.[2,3] It is among the common causes of emergency gynaecological admissions in the tropics where women present late.[3] In complicated cases, it may lead to maternal morbidity and mortality.[4] It is associated with impaired fertility as women with a prior history of ectopic pregnancy have only 40-60% chance of reproduction after surgery and in women with previous ectopic pregnancy the risk of recurrent ectopic pregnancy is 12-18%.[5]

The incidence of ectopic pregnancy varies, even in the same geographical locations. The incidence of ectopic pregnancy has been estimated to be between 1-2% of all pregnancies.[4] In Nigeria the incidence varies, Osegi et al reported 2.5% in Yenagoa, Onwuhafua et al reported 1.4% of deliveries in Kaduna, Northern Nigeria and Anorlu et al reported 2.3% of deliveries in Lagos, South-west Nigeria.[6,7,8]

There is evidence that ectopic pregnancy is increasing worldwide irrespective of the denominator (pregnancies or deliveries) used in computing the incidence.[9] The increase is attributed to rise in prevalence of pelvic inflammatory disease, increasing rates of induced abortions, the practice of assisted reproduction and more importantly early and more accurate diagnosis of ectopic pregnancy.[10]

The usual site of occurrence is the fallopian tube accounting for 97% while 2% are uterine ectopic pregnancy (interstitial). The remaining include abdominal, ovarian and cervical.[1,3,6] Heterotopic pregnancy which is defined as an ectopic pregnancy in combination with an intrauterine pregnancy occurs in 1 in 15,000 – 40,000 spontaneous pregnancies and in up to 1% of patients undergoing in vitro fertilization.[1] The incidence of bilateral ectopic pregnancy has not been documented but isolated cases have been reported in the literature.[1,3]

The aetiology of ectopic pregnancy is not well understood. However, several predisposing factors have been found to be associated with ectopic pregnancy. They include history of previous ectopic pregnancy, use of intra-uterine device (IUD), sterilization, pelvic inflammatory disease, chlamydial infection, early age of intercourse and multiple partners. History of infertility, previous pelvic surgery, increased maternal age, cigarette smoking, strenuous physical exercise, in-utero diethylstilbestrol (DES) exposure, progestin-only

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contraceptives, tubal endometriosis, benign tumors and cysts of the tubes etc.[1,6,7]

The most common form of presentation in the tropics is ruptured ectopic although a few cases of unruptured ectopic pregnancies are increasingly being diagnosed.[3]

There are various treatment modalities for the management of ectopic pregnancies which include conservative, medical and surgical methods. Salpingectomy is the most frequently performed surgical treatment because the ectopic pregnancy is more often ruptured prior to presentation to the hospital.[11] This is because in most instances in our practice in the Sub-Saharan Africa, there used to be delays emanating from self- medications, lack of will and finance to take the patient to the hospital, to delay in transportation, and lack of expertise in making definite diagnoses and instituting adequate management plan by health care workers especially in the rural settings. Other less radical and conservative methods of treatment will include salpingostomy and transfimbrial extraction.[11] Ectopic pregnancy is among the common causes of admissions into gynaecologic wards in Nigeria.

The review was undertaken to determine the incidence, clinical presentations, morbidity and mortality of ectopic pregnancy at ATBUTH, Bauchi, Nigeria, over a two year period with the overall goal of preventing recurrence of factors that may contribute to the morbidity and mortality associated with ectopic pregnancy.

Materials and Methods

This is a descriptive retrospective study of patients with ectopic pregnancy treated at Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), a 700-bed tertiary health institution located in Bauchi, Nigeria, from 1st January, 2013 to 31st December, 2014. The hospital has a well established Obstetrics and Gynaecology department attending to patient referrals from neighbouring States. Cases of ectopic pregnancies were obtained from hospital admissions, operation and discharge records.

Data on socio-demographics, clinical characteristics and management of the patients were collected and computed using excel spread sheet and statistical analysis was done using SPSS version 23 and results presented as frequency tables, percentages, mean (± SD).

Study population

The study population involved pregnant women with ectopic pregnancy managed in the Department of Obstetrics and Gynaecology of ATBUTH, Bauchi, Nigeria, over the two year period. The confirmation of diagnoses of ectopic pregnancies were performed using the clinical features and pelvic ultrasound imaging technique and by laparoscopy.

Ethical consideration

This was a retrospective cross-sectional study and ethical clearance was given to conduct this study.

Results

During the period under review, a total of 98 cases of ectopic pregnancies were treated constituting 6.2% of 1,577 gynaecological admissions. Only 74 cases were retrieved of the 98 treated ectopic pregnancies, giving a retrieval rate of 75.5%. There were 6,738 deliveries within the period therefore the incidence of ectopic pregnancy was 1.45% of deliveries. Fifty eight patients (78.4%) were married while 16(21.6%) were not married. The study showed the age distribution of the patients ranging between 15-40 years with a mean of 26.5 ± 4.9 years. Majority of the patients (39.2%) were between 25-29 years. It also showed the parity distribution of the patients. The range of parity was 0-9. The incidence of ectopic pregnancy in this study was more among the nulliparous women.

Table 1: Socio-demographics of women with ectopic pregnancy

Characteristics	Frequency (N=74)	Percentage (%)
Age (years)		
15-19	5	6.8
20-24	21	28.3
25-29	29	39.2
30-34	15	20.3
35-39	4	5.4
40	0	0.0
Parity		
0	26	35.1
1	17	23.0
2	5	6.8
3	8	10.8
4	6	8.1
≥5	12	16.2

This study also showed the symptoms and signs that patients with ectopic gestations presented with in our hospital. Abdominal pain was the commonest symptom and it occurred in 72 (97.3%) of patients. Abdominal tenderness was elicited in 71 patients treated (95.9%), cervical motion tenderness was also elicited in 69 patients (93.2%) while 23 patients (31.1%) presented in shock. Sixty-nine patients (93.2%) had tubal pregnancy; 2 patients (2.7%) ovarian pregnancy; 2 patients (2.7%) had abdominal pregnancy while one patient (1.4%) had cervical ectopic pregnancy. Of the tubal pregnancy, 29

(42.0%) occurred in the left tube while 40 (58.0%) occurred in the right tube. Sixty-eight (91.2%) were ruptured ectopic pregnancies while 6 (8.1%) were unruptured forms. The distribution of tubal pregnancy are as follows; 44 (63.8%) in the ampullary region; 6 (8.7%) Isthmus; 11 Cornual (15.9%) and 8 (11.6%) were located at the fimbrial end of the tube. The treatment options for the patients showed that 72 patients (97.3%) had exploratory laparotomy while 2 patients (2.7%) had laparoscopic procedures. Total unilateral salpingectomy was the procedure of choice in 63 patients (85.1%), 7 (9.5%) had Salpingoophorectomy on the ipsilateral side, while 2 patients (2.7%) had laparoscopic salpingectomy.

Table 2: Clinical Presentations of Ectopic Pregnancy

Symptoms	Frequency (N=74)	Percentage (%)
Abdominal pain	72	97.3
Amenorrhoea	62	83.8
Vaginal bleeding	51	68.9
Dizziness/Fainting	31	41.9
Abdominal swelling	12	16.2
Vomiting	25	33.8
Dysuria/frequency	10	13.5
Fever	12	16.2
Shoulder tip pain	1	1.4
Diarrhoea	3	4.1
Clinical Signs		
Abdominal tenderness	71	95.9
Cervical motion tenderness	69	93.2
Palor	55	74.3
Tachycardia	49	66.2
Rebound tenderness	25	33.8
Guarding	19	25.7
Shock	23	31.1

Table 3: Surgical treatments performed for the ectopic pregnancies

Operation	Frequency (N=74)	Percentage (%)
Salpingectomy	63	85.1
Total	43	58.1
Partial	20	27.0
Transfimbrial Extraction	2	2.7
Salpingo-oophorectomy	7	9.5
Laparoscopic salpingectomy	2	2.7

Three patients (4.05%) had wound infection as post-operative complications. The duration of hospital stay was from 2 to 10 days with a mean of 5.4 days. 86.5% of the patients who where managed for ectopic pregnancy had blood transfusion.

Discussion

In this review the incidence of ectopic pregnancy in our hospital was 1.45% of deliveries. This rate is similar to 1.4% reported by Onwuhafua et al in Kaduna, Northern Nigeria but higher than 0.87%, and 1% reported by Swende et al in Makurdi and Omokanye et al in Ilorin, Nigeria respectively.[3,8,12] It is however, lower than 1.68% reported by Gharoro et al in Benin, 2.3% reported by Anorlu et al in Lagos and 2.7% reported by Akaba et al in Abuja.[9,13,14] These differences might be due to study population groups with different underlying risk factors.[10] The majority of the ectopic pregnancies (67.5%) occurred among women aged 20-29 years of age. A greater percentage of them were of low parity; nulliparous women were 35.1% while the primiparous women were 23%. This is similar to studies done by Gharoro et al in Benin and and Musa et al in Jos both in Nigeria.[11,13] These findings imply that majority of patients who had ectopic pregnancies were young nulliparous women and subsequent reproductive potentials will be greatly threatened as the risk of recurrence increases. About 95% of the study group was less than 35 years of age. This emphasizes the need for prevention and proper treatment of sexually transmitted infection, prevention of puerperal sepsis and post-abortal sepsis among women of reproductive age group.[11]

The average age of those diagnosed with ectopic pregnancy was 26.5± 4.9 years and it is said that an early age of sexual debut increases the risk of ectopic pregnancy almost two fold whereas late stage of sexual debut was protective.[8] Risk factors implicated in ectopic gestation include; history of pelvic inflammatory disease, history of tubal ligation; contraception failure, previous ectopic pregnancy, tubal reconstructive surgeries, subfertility, assisted reproductive therapy, previous induced abortion, tubal endometriosis, congenital malformation of the tubes, smoking.[5,15]

Abdominal pain, amenorrhoea and vaginal bleeding represent the most common symptoms of presentation in this study; which is similar to other reports.[13,16,17] Atypical symptoms of ectopic pregnancy found in this review include fever, diarrhoea, dysuria and frequency. Similar findings have been reported by others.[7,18,19] The reasons for these are not obvious but they may be due to haemoperitoneal pressure to the pelvic viscera. Akingba and Eneli in Lagos suggested that the habit of using purgatives by Nigerians for the relief of any abdominal ailment might be responsible for the gastrointestinal symptoms.[20] Irritation of the rectum by blood collected in the pouch of Douglas is also a possible cause of the gastrointestinal symptoms.

Abdominal tenderness was the most common sign elicited in this review. Similar findings were reported by

other researchers.[1,17,21] 93.2% of the patients in the study had positive cervical motion tenderness on pelvic examination; this is similar to the findings from other studies.[1,16,22] Tubal variety constitutes the majority of cases of ectopic pregnancy in this study 93.2% and the ampullary type has highest incidence of 63.8% of tubal ectopic pregnancy and this is consistent with findings in standard Obstetrics and gynaecologic texts.[1,5,15]

One of the strategies to preserve future fertility in the management of ectopic pregnancy is conservative management.[11] Conservative management has been shown to improve subsequent fertility chances.[1,23] However, this management modality was not possible in our setting because most of the patients with ectopic pregnancy presented with the ruptured tubal variety with significant haemoperitoneum and were haemodynamically unstable. Exploratory laparotomy still remains the mode of surgical intervention as most of our patients had it while only 2.7% of patients benefited from laparoscopic salpingectomy. This is consistent with findings from other reports where emergency exploratory laparotomy was the main stay of management.[7] Salpingectomy was performed on most of the patients with ectopic pregnancy due to extensive tubal damage. This procedure is rapid and technically simple to perform. 58.1% had total salpingectomy while 27.0% had partial salpingectomy. 9.5% of the patients had salpingo-oophorectomy and 2.7% had transfimbrial extraction. The rate of transfimbrial extraction observed from this study was similar to 1.67% reported by Rabiu et al in Kano, but is higher than the reports by Odunvbun et al in Delta State, Nigeria and Okoror et al in Benin, Nigeria, where none was performed.[24,25,26] These procedures are associated with high rate of persistent trophoblastic tissues; postoperative bleeding and subsequent ectopic pregnancy hence they are less commonly done.[5,24]

The right tubes are more frequently affected than the left tube. In this study the right tube was more affected than the left tube. This is similar to the already established pattern in earlier reports.[8,12,24]

Three patients had post-operative complication of wound infections which translated to the rate of 4.05%, similar to 4.02% reported by Onwuhafua et al, but higher than 1.11% reported by Rabiu et al in Kano,[8,24] Though this level of wound infection is comparatively low it may possibly suggest that some of the precautionary measures may have been waived in a bid to resuscitate and save the patients' lives. Despite the dire need to save these patients' lives, efforts should always be made to prepare the patient well pre-operatively as it will have effects on the outcome of the patient's management.

The average duration of hospital stay of 5.4 days is lower than 6.63 days quoted by Rabiu et al in Kano.[24] This may be explained by the low level of postoperative complication amongst our patients.

There was no maternal death recorded among the patients that were managed for ectopic pregnancy at the time of this review. The case fatality of zero per 1000 recorded in this study is the same with the reports from Kano and Ilorin.[3,24]

Blood transfusion is life saving and may be inevitable in the management of ruptured ectopic pregnancy. Sixty four of the patients managed in this study had blood transfusion. This is contrary to the report from Benin where 54.6% of their patients had auto-transfusion during surgery.[13] Emphasis should therefore be on auto-transfusion. Where applicable, this can be by intra-operative blood salvage. It can be accomplished by using a simple system consisting of a blood collecting device, an in-line filter system and a container for anticoagulation.[6] The simple Eatset or solcotrans plus may be used for collecting and filtering shed blood before re-infusion.[27] Auto-transfusion will eliminate or reduce the incidence of blood transfusion reactions and transmission of infections which include human immunodeficiency virus infection, hepatitis and other blood borne infectious diseases.[27]

Conclusion

The incidence of ectopic pregnancy is more in young nulliparous women and prevention of pelvic inflammatory disease among the girls, which is an identified risk factor in the tropics, will help reduce the occurrence of this life threatening condition. More so, a high index of suspicion is needed in making the diagnosis of ectopic pregnancy and instituting prompt management for the patients.

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Liver abnormalities detected by ultrasound scan among apparently healthy population in Jos, Nigeria

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Abstract

Background: Most individuals with liver abnormalities are asymptomatic. Patients present most of the time with complications of liver cirrhosis. Abdominal ultrasound scan (USS) is relatively cheap, inexpensive, non-invasive, and readily available. It is a useful tool in screening common liver abnormalities such as cirrhosis, liver tumors, liver cysts, fatty liver and hepatomegaly.

This study was aimed at identifying the common liver abnormalities in our environment, among apparently healthy individuals.

Methods: We reviewed retrospectively the results of a mass screening exercise that was conducted at Farin gada community in Jos, Plateau state, by the Hepatology unit of the Jos University Teaching Hospital (JUTH). Two hundred and eighty (280) apparently healthy individuals (without documented symptoms and signs of liver diseases), aged 18 years and above were studied. The data was analyzed using SPSS version 23.

Results: One hundred and fifty seven (56.1%) of the study subjects were females. The mean age of the study subjects was 37.8±13.6 years. The mean BMI in the study was 26.3±6.1 kg/m^2, and 59(21.1%) were obese (BMI $\geq$ 30kg/m^2). The commonest liver abnormalities diagnosed by ultrasound were hepatomegaly (6.4%) and fatty liver (6.4%). Four (1.4%) had features of liver cirrhosis on USS and one participant had a liver tumor.

Conclusion: The common USS-diagnosed liver abnormalities among apparently healthy individuals in our environment include fatty liver, hepatomegaly and liver cirrhosis.

Key words: abdominal, cirrhosis, hepatomegaly, liver, ultrasound

Date received: 12 July 2021; accepted: 20 May 2022

Highland Med Res J 2022;22(1):6-9

Introduction

Liver disorders are a common cause of morbidity and mortality in our environment.[1] This is because the early stages of most liver disorders occur without symptoms or signs.[2] Therefore, presentations are mostly late, usually with complications of cirrhosis such as ascites, hepatic encephalopathy, variceal bleeding, and in some instances, primary liver cell carcinoma.[2]

Because of the high prevalence of risk factors of liver disorders such as HBV, HCV, aflatoxins, schistosomiasis and the prevalence of obesity with its attendant complications of Non-Alcoholic Fatty Liver Disease (NAFLD) in our environment, there is a growing incidence of end stage liver disease.[1,2] It is therefore imperative to promote practice that enhance early detection of liver abnormalities, especially in sub-Saharan Africa where prevalence of advanced liver disease is high despite to highly constrained resources.[1,2] Also, data on the epidemiology and pathogenesis of common liver abnormalities in our environment which is needed to guide the formulation of preventive policies and provide direction in the institution of strategies in prevention of end stage liver disease, is scarce.[1,2]

Abdominal ultrasonography is a safe, relatively cheap and readily available non-invasive technique for the examination of the liver.[3] Liver disorders such as tumors, cirrhosis, fatty liver, cysts, abscesses, among several others, are usually detected by abdominal ultrasound scan.[3]

Non-alcoholic fatty liver disease, for example, which is associated with obesity, diabetes mellitus or dyslipidemia has become an important risk factor for end-stage liver disease mainly because of the global increase in the prevalence of obesity.[4] Early detection among at-risk individuals is key in prevention of a future epidemic of end-stage liver disease.[4] Conventional B-mode ultrasonography is the most common technique used to assess the presence of fatty liver in clinical settings and population studies.[3,4] Fatty liver is diagnosed based on the following ultrasound parameters: parenchymal brightness (increased echogenicity), liver-to-kidney contrast, deep beam attenuation, bright vessel walls, and gallbladder wall definition.[3,4] The overall sensitivity and specificity of ultrasound in detection of moderate to severe fatty liver have been shown to be accurate and comparable to those of histology (gold standard).[5]

Liver cirrhosis is the end stage of chronic liver injury.[6] It is also a precursor of hepatocellular cancer. Liver cirrhosis is associated with several life threatening complications.[6] Early detection of this condition with abdominal USS among high-risk groups (such as people

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with HBV and HCV infection), will provide an opportunity for instituting measures that will prevent the development of life threatening complications such as variceal bleeding, hepatic encephalopathy and hepatocellular carcinoma.[2]

Liver tumors especially hepatocellular carcinoma (HCC) have a high prevalence in sub-Saharan Africa.[1,6] More than 80% of global HCC patients are estimated to occur in sub-Saharan Africa (SSA) and Eastern Asia.[1,7] The common risk factors for HCC are hepatitis B and C virus infections, alcohol overuse, and nonalcoholic fatty liver disease (NAFLD).[1,2] Early-stage HCC is curable with surgical resection and liver transplant.[8] However, treatment of intermediate- and advanced-stage HCC is largely palliative and carries a grave outcome.[9] Early detection of HCC and or detection of precancerous stages are therefore the best chance for any reasonable intervention.[8]

There is therefore, a need for policies and guidelines on regular screening using tools such as abdominal ultrasound, in high risk groups such as individuals with liver cirrhosis, obesity or HBV infection, in our environment. Since routine screening for rare disease conditions are not necessarily cost-effective, formulation of policies such as this, will require epidemiological data on liver abnormalities in our environment. This study was aimed at providing data on the common liver abnormalities detected by abdominal ultrasound (USS) among apparently healthy (asymptomatic) individuals.

Methods

We reviewed retrospectively the results of a mass screening exercise that was conducted at Farin gada community, Jos North Local Government Area of Plateau state, at Jos ECWA Theological School (JETS). This screening exercise was organized by the Hepatology unit of Jos University Teaching Hospital (JUTH) as part of the activities to mark the world liver day. The screening exercise was done in April 2021. The population comprised of the students and staff of the ECWA Theological School, students and staff of the ECWA College of Education, people from the Farin gada community and several others from near-by communities. Formal approval was obtained from the JETS management and informed-consent from all participants for the writing and publication of the data.

Two hundred and eighty (280) apparently healthy individuals (without documented symptoms and signs of diseases) aged 18 years and above, who had consented for publication of their data, were enrolled. The data was analyzed for bio-demographics (age, sex, level of education), biophysical data (weight, height and BMI), history of alcohol use, results of Hepatitis B surface antigen (HBsAg) and anti-HCV test, and abdominal ultrasound scan findings.

Abdominal ultrasound scan was done by radiologists from JUTH and ECHO-LAB, Abuja. HBsAg and Anti-HCV were done using LabACON rapid test kits.

Participants with shrunken liver, coarse heterogeneous echotexture, surface nodularity were considered as having liver cirrhosis.[10] Fatty liver was diagnosed when the liver was diffusely echogenic (Liver-to-kidney contrast) while acute hepatitis was diagnosed in participants with more extensive demonstration of the portal vein radicle walls and overall decreased echogenicity of the liver (giving a starry-sky appearance).[10] Liver size greater than 16cm (in the sagittal plane in the mid-clavicular line from the diaphragm to the inferior border) was considered as hepatomegaly.[11] Liver masses were characterized either as cystic or solid.

We carried out a descriptive analysis using SPSS version 23.

Results.

Over three hundred and fifty individuals participated in the mass screening exercise. Two hundred and eighty apparently healthy participants (without documented symptom/signs of diseases) who had granted written informed-consent were enrolled. One hundred and fifty seven (56.1%) of the study subjects were females. The mean age of the study subjects was 37.8±13.6 years. The mean BMI in the study was 26.3±6.1 kg/m$^{2.}$ One hundred and thirty (46.4%) had a normal BMI while 59(21.1%) were obese (BMI ≥30kg/m^2). (See Table 1.)

Fifty (17.9%) had a history of alcohol use. Forty one (14.6%) had positive HBsAg while 5 (1.8%) had positive Anti-HCV. (See Table 1). Fifty two (18.6) of the study participants had an abnormality on abdominal scan. The commonest liver abnormalities diagnosed by ultrasound were hepatomegaly (6.4%) and fatty liver (6.4%). Four (1.4%) participants had features of liver cirrhosis on USS. (See Table 2).

Twelve (67%) of the 18 participants with fatty liver were females. Also, all participants with fatty liver were above 30 years of age. Sixteen (89%) out of 18 of the subjects with fatty liver on ultrasound scan (diffusely hyper-echogenic liver) were either over-weight or obese (had BMI of ≥ 30kg/m^2). Fourteen (78%) of the 18 participants with fatty liver had Non-alcoholic fatty liver (Only 4 of the participants with fatty liver had a history of alcohol use). Thirteen (72%) of the 18 subjects with hepatomegaly were either obese or over-weight, while 7 (39%) had history of alcohol use. One of the four subjects with cirrhosis had HBV infection while the other subjects had no obvious risk factor. One participant had a solid liver mass with positive HBsAg.

Table 1: Demographic characteristics and some risk factors of liver disease among study participants

Demographic characteristics	Frequency (n=280)	Percentage
Gender		
Male	123	43.9
Female	157	56.1
Age group		
≥30	101	36.1
31-40	79	28.2
>40	100	35.7
Occupation		
Student	108	38.6
Civil servants	74	26.4
Clergy	24	8.6
Business men/women	25	8.9
Others(unemployed, retiree)	49	17.5
BMI status		
Underweight (<18.5)	9	3.2
Normal (18.5-24.9)	130	46.4
Overweight (25-29.9)	82	29.3
Obese (>29.9)	59	21.1
HBsAg Positive	41	14.6
Anti-HCV positive	5	1.8
History of Alcohol ingestion	50	17.9

Table 2: Ultrasound findings among study participants

USS finding	Frequency	Percentage
Normal	228	81.4
Hepatomegaly	18	6.4
Fatty liver	18	6.4
Cirrhosis	4	1.4
HCC (confirmed histologic.)[α]	1	0.4
Hepatic Cyst	2	0.8
Hepatitis	1	0.4
Others (renal stone, renal cyst, ascites, renal parenchymal disease)	8	2.8
TOTAL	280	100

[α]obtained from the follow-up documents of patient at JUTH hepatology unit, following an informed-consent.

Discussion

Although liver biopsy is the gold standard for the diagnosis of most liver parenchymal diseases, it is invasive and ethically inappropriate for screening or epidemiologic studies.[12] Abdominal ultrasound scan is non-invasive, relatively inexpensive and available, making it a preferred modality for the screening of most liver diseases.[3,5]

The most prevalent liver abnormalities in the study as detected by USS were hepatomegaly and fatty liver (6.4% each). Most of the participants who had these conditions were obese females. The significance of diagnosing fatty liver on USS lies not only with increased risk of end stage liver disease, but also with strong risk of cardiovascular disease.[5,12] Fatty liver that is not associated with alcohol intake (Non-alcoholic Fatty Liver Disease - NAFLD) is said to be on the increase, likely due to the increase in prevalence of obesity.[5] These group of patients, although mostly asymptomatic, usually require both liver and cardiovascular work-up.[12,13] The prevalence of NAFLD is generally lower in Africa (6-13.5%) [14,15] compared with the western countries(20- 50%).[12,15] Several studies have documented a rising prevalence in Africa and argued that reports of low prevalence is likely due to scanty data.[15] Since this condition is considered to be a global risk of future epidemic of end stage liver disease,[16] there is need to build on our study, by conducting well-designed studies on NAFLD in Africa.

Four (1.4%) participants had features of liver cirrhosis in our study. Because patients with compensated liver cirrhosis are usually asymptomatic, and presentation is usually with complications such as upper gastrointestinal bleeding, hepatic encephalopathy, ascites, it is important to screen at-risk individuals in order to institute measures such as endoscopic variceal surveillance, which could prevent upper gastrointestinal bleeding, a complication with a very high mortality rate.[17] The global prevalence of cirrhosis (from autopsy studies) is estimated to be about 4.5% to 9.5% of the general population.[18] A prevalence of 4-13% has been found among HBV infected patients in Africa,[19] and a prevalence of 1.06% was reported in a large study in the US.[20] The variation in prevalence rates can easily be explained from the methods of diagnosing liver cirrhosis and the differences in the populations that were studied. Although HBV infection is considered to be the leading cause of cirrhosis in our environment,[1,2] only one of the four subjects with cirrhosis had HBV infection while the other subjects had no obvious risk factors, this highlights the significance of commonly neglected risk factors, such as NAFLD.

Only one participant (0.4%) had a solid liver mass which was subsequently confirmed histologically to be hepatocellular carcinoma (during his clinic follow up visits). Abdominal USS has been recommended by different professional bodies (such as American Association for the Study of Liver Disease (AASLD), European Association for the Study of Liver (EASL)) for HCC surveillance in at-risk individuals such as patients with HBV infection or liver cirrhosis.[8] HCC surveillance provides the opportunity for early detection as only patients detected with early disease have a chance of

curative therapy.[8,9]

Conclusion

The common liver diseases in apparently healthy individuals in our environment, detected by abdominal USS are fatty liver, hepatomegaly and liver cirrhosis. There is a need for a large multi-centre well-designed study to build on our study and further elaborate on the epidemiology of liver diseases in our environment.

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The duration of response to intra-articular steroid injections in patients with osteoarthritis of the knee: a single centre's experience

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Abstract

Background: The burden of Osteoarthritis (OA) is huge, with a sizable proportion of patients that have failed the analgesic treatment and are not candidates for surgery or have refused surgery. Intraarticular corticosteroid injections (IASI) are considered standard of care for pain relief and control of local inflammation in this category of OA patients. However, there is a wide variation in the duration of response to steroid injections. This study was designed to determine the duration of response to IASI in patients with osteoarthritis of the knee in our environment.

Methods: Fifty-four patients aged between 30 and 80 years who have been diagnosed with osteoarthritis using the American College of Rheumatology criteria and have met the inclusion criteria were enrolled in the study and were given intra-articular steroid injections to the knee. Their responses were assessed using visual analogue scale (VAS) score, Western Ontario, and McMaster Universities Osteoarthritis Index (WOMAC) score at 2, 4 and 12 weeks. The patients were classified as responders if there was a fifty percent improvement in the WOMAC scores and a fifty percent reduction in the VAS score and non-responders if there is less than fifty percent improvement in the WOMAC score and less than fifty percent reduction in the VAS score.

Results: Fifty-two patients completed the study; 78.4% and 100% of these had good WOMAC and VAS responses respectively at 2 weeks but this proportion gradually reduced to 47.9% and 56.3% for WOMAC and VAS respectively at 3 months.

Conclusion: Intra-articular steroid injections provide sustained response in patients with osteoarthritis of the knee who have failed analgesic therapy and are not candidates for total knee replacement for up to three months and the response decreases with advancing age.

Key words: Intra-articular steroid injection (IASI). Osteoarthritis. Duration of response.

Date received: 11 March 2022; accepted: 20 May 2022

Highland Med Res J 2022;22(2):10-14

Introduction

Osteoarthritis (OA) is by far the most usual form of joint disease throughout the world.[1] It is strongly associated with older age; some studies estimate that over 80% of people ≥55 years of age have osteoarthritis of at least one joint.[2] OA affects the hips, knees, spine, hands, and feet. Knee OA is the most important because of the high prevalence of pain and disability it causes in older adults, with resultant increase in healthcare resource utilization particularly in terms of joint replacements.[1,2]

Hydrocortisone was introduced for intra-articular injection in 1951.[3] Since then, vast experience has confirmed the value of this agent and of other corticosteroid injections for combating pain and inflammation when injected into the joint in patients with inflammatory arthropathies. However, it's use in osteoarthritis has been fraught with controversies. Early studies in mice, rats, and rabbits suggested that multiple corticosteroid injections might alter cartilage protein synthesis and consequently damage the cartilage.[3] These deleterious effects curbed early enthusiasm for intra-articular corticosteroid therapy in osteoarthritis. Subsequent reviews found that, the knee joints of patients who received multiple intra-articular injections of steroids showed no significant evidence of destruction or accelerated deterioration.[4,5] A detailed study of intra-articular steroid injections in monkeys also showed no appreciable joint damage, suggesting that primates' joints respond differently to those of rodents.[6] Most authorities now consider intra-articular corticosteroid therapy for osteoarthritis of considerable value when used appropriately and judiciously.[3,4,7-10]

The duration of response to intra articular steroid injection varies greatly. Corticosteroid injection into the knee for management of osteoarthritis have been shown to be statistically and clinically significant at reducing pain in the short term.[2,11-14] However, the exact duration of pain relief varies. A systematic review of level 1 studies published in 2009, found that corticosteroid injections for management of pain related to osteoarthritis of the knee showed statistically and clinically significant pain relief at 1 week after injection but the benefit was not significantly better than placebo beyond 1 week.[2] A Cochrane Review update in 2015 supported this result by concluding that the clinical benefits of intra-articular steroid knee injections

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remained unclear 1 to 6 weeks after injection because of low quality of evidence.[11] No evidence of clinical benefit was found 6 months after patients received an injection. Studies on this topic are variable, resulting in a lack of high-quality, high powered, placebo-controlled prospective randomized trials. The 2015 Cochrane Review graded the quality of evidence as "low," which was defined as having little confidence in the results due to the discordant methods and the small sample sizes used in the studies.[11] Data from published trials indicate, however, that there is significant variation in both the magnitude and duration of response to steroid injections. As an example, the magnitude of pain improvement measured using a visual analogue scale (VAS) on a 0-100 scale varied between a mean change of 16.2 and 35.7 mm, while the duration of pain relief varied between 1 and 8weeks.[1,15] Although the explanation for the wide range in response is unknown, we endeavored to offer information on the magnitude and duration of response to IASI in our environment in this research.

Material and Methods

Fifty-four patients visiting the Jos University Teaching Hospital, Jos Plateau state from October 2019 to October 2020 were included in the study by simple convenient sampling. Informed consent was obtained from the patients at the time of enrollment, and the study was approved by the ethics committee of Jos University Teaching Hospital. The inclusion criteria were patients who were 30 to 80 years of age, with a diagnosis of OA based on the American College of Rheumatology (ACR) clinical classification criteria[16] with or without radiological support and who were not responding to conventional treatment of OA such as NSAIDs, acetaminophen and physiotherapy for more than 3 months. Exclusion criteria included known hypersensitivity to Depo Medrol 40mg and 2% Lidocaine.

Relevant history, physical examination (body mass index and detailed musculoskeletal examination) and knee radiograph was obtained from the subjects and data entered. Prior to administration of intra-articular steroid injection (IASI) visual analogue scale (VAS) score,[16] Western Ontario, and McMaster Universities Osteoarthritis Index (WOMAC) score[17] were measured for each subject. Under proper aseptic conditions, 40 mg methylprednisolone acetate mixed with 2 % lignocaine was injected into the symptomatic knee, and patients were advised to observe 24-hour bed rest at home before returning to their pre-IASI activity and were not placed on any form of physiotherapy, acetaminophen and NSAIDs. VAS and WOMAC were re-calculated at 2 weeks, 4 weeks, and 3 months post IASI administration. Subjects who had improvement in WOMAC score of 50 % or more compared to the baseline before IASI were considered responders, and those with less than 50% improvement from their initial WOMAC score were regarded as non-responders. Similarly, 50% or more reduction in VAS score was categorized as responders, and less than 50 % reduction was categorized as non-responders.

The data was entered into excel sheet which was subsequently exported into Statistical Package for the Social Sciences version 23.0. for analysis. Univariate analysis of the socio-demographic characteristics of the patient were done, and the basic descriptive statistics were presented in frequency and percentages. Quantitative variables were described using mean and standard deviation while qualitative variables were described using frequencies, proportions, charts, and tables. Proportions were compared by calculating $\chi 2$ with Yates correction or by Fisher exact test. The WOMAC score was transformed to a dichotomous variable of responders and non-responders which include the partial responders, VAS response was already in the dichotomous variable state.

Results

A total of fifty-two patients who met the inclusion criteria were recruited for the study; four patients were lost to follow up, giving an attrition rate of 15.4%. About 95% of the patients were above the age of 40 years old with a mean age of 53.5 years. There was a predominance of females with a male to female ratio of 3:7. Table 1

WOMAC and VAS responses were 78.4 percent and 100 percent for the first two weeks and then gradually decreased to 47.9 percent and 56.3 percent for the second and third weeks, respectively. (Table 2)

Following IASI treatment for three months using WOMAC score, age was found to be associated with outcome. As age increases, the percentage of patients with a poor outcome response increases from zero percent at 40 years to 85.7 percent at 79 years with a statistically significant P value of .003. At three months, 73.3 percent of non-alcoholics had a poor response, but 83.3 percent of alcoholics had a good response. This relationship was statistically significant, with a P value of 0.001. There is statistically significant correlation with sex, with a P value of 0.016, 64.7% of females had a poor response while 78.6 percent of males had good response (Table 3).

Table: 1 Socio-demographic Characteristics

Variable	Frequency (%)
Age (Years)	
<40	2(4.2)
40-59	32(66.7)
60-79	14(29.2)
Mean ± SD	53.5±10.1
Sex	
Male	14(29.2)
Female	34(70.8)
Education	
Primary	17(35.4)
Secondary	21(43.8)
Tertiary	10(20.4)
Occupation	
Business	4(8.3)
Civil servant	15(31.3)
Housewife	15(31.3)
Lecturing	2(4.2)
Trading	12(25.0)
BMI	
Normal	6(12.5)
Overweight	16(33.3)
Obese	24(54.2)
Systemic Hypertension	24(50.0)
Hepatitis B positive	4(8.3)
Hepatitis C positive	13(27.1)
History of alcohol ingestion	18(37.5)
History of smoking	6(12.5)

Table:2 The Response to Intra-Articular Steroid Injections

Response	Total	Percent
WOMAC 2 weeks		
Non-responders	10	21.6
Responders	38	78.4
6 weeks		
Non-responders	11	22.9
Responders	37	77.1
3 months		
Non-responders	25	52.1
Responders	23	47.9
VAS 2weeks		
Non-responders	0	0.0
Responders	48	100.0
6 weeks		
Non-responders	9	18.8
Responders	39	81.3
3 months		
Non-responders	21	43.8
Responders	20	56.3

Discussion

Osteoarthritis is a degenerative joint disorder, which is a public health burden since it is one of the most common joint diseases all over the world and a common presentation in most outpatient clinic. It is strongly associated with age, and extremely common in older people. The mean age of subjects in the present study is in keeping with well-known age-related prevalence of osteoarthritis peaking at about age 60 years.[1,18] The male to female ratio in the present study is similar to the female preponderance recognized globally.[1]

The results of the present study have been replicated in other studies, which have demonstrated that corticosteroid injections into the knee for the therapy of osteoarthritis are statistically and clinically significant in lowering pain in the short term.[2,11-14] However, the exact duration of pain relief remains a controversy. A systematic review published in 2009 of level 1 studies found that corticosteroid injections for management of pain related to osteoarthritis of knee showed statistically and clinically significant pain relief at 1 week after injection.[2] There seemed to be some benefit in the short-term after 1 week, but the data was not statistically significant compared with placebo. A Cochrane Review update in 2015 supported this result by concluding that the clinical benefits of intra-articular steroid knee injections remained unclear after 1 to 6 weeks injection because of low quality of evidence.[11] No evidence of clinical benefit was found 6 months after patients received an injection. Studies on this topic are variable, and a lack of high-quality, high powered, placebo-controlled prospective randomized trials exists; the 2015 Cochrane Review graded the quality of evidence as "low," which was defined as having little confidence in the results due to the discordant studies based on small studies.[11] Individual patient variables and severity of arthritis may affect the efficacy of injections. Recently, a group of 100 patients who got a steroid injection for symptomatic knee osteoarthritis reported better WOMAC and Visual Numeric Scale scores at 3, 6, 12, and 24 weeks following injection, except for the Visual Numeric Scale score at 24 weeks, as compared to baseline values.[12] The duration of response to intra articular steroid injection varies greatly. The present study shows that intra articular steroid injection is effective in the management of patient with osteoarthritis of the knee joint, this is also in keeping with several studies which supports its use.[4,7,10] This study showed that IASI was effective in reducing pain in the first two weeks. Most patients had improvement in their pain scores on both scales in the first two weeks post

Table 3 Association between background characteristics and Outcome at the end of study Based on WOMAC

Characteristics	Outcome		Total	$\chi 2$	P-value
	Poor	Good			
Age					0.003F*
<40	0(0.0)	2(100.0)	2(4.2)		
40-59	13(40.6)	19(59.4)	32(66.6)		
60-79	12(85.7)	2(14.3)	14(29.2)		
Sex					0.016Y*
Male	3(21.4)	11(78.6)	14(29.2)		
Female	22(64.7)	12(35.3)	34(70.8)		
Education					0.845F
Primary	9(52.9)	8(47.1)	17(35.4)		
Secondary	12(57.1)	9(42.9)	21(43.8)		
Tertiary	4(40.0)	6(60.0)	10(20.4)		
Occupation					0.060F
Business	0(0.0)	4(100.0)	4(8.3)		
Civil servant	7(46.7)	8(53.3)	15(31.3)		
Housewife	10(66.7)	5(33.3)	15(31.3)		
Lecturing	0(0.0)	2(100.0)	2(4.2)		
Trading	8(66.7)	4(33.3)	12(25.0)		
BMI					0.362
Normal	2(33.3)	4(66.7)	6(12.5)		
Overweight	7(43.8)	9(56.3)	16(33.3)		
Obese	16(61.5)	10(38.5)	26(54.2)		
Systemic Hypertension					>0.999Y
Yes	13(54.2)	11(45.8)	24(50.0)		
No	12(50.0)	12(50.0)	24(50.0)		
Hepatitis B					>0.999Y
Yes	2(50.0)	2(50.0)	4(8.3)		
No	23(52.3)	21(47.7)	44(91.7)		
Hepatitis C					0.261Y
Yes	9(69.2)	4(30.8)	13(27.1)		
No	16(45.7)	19(54.3)	35(72.9)		
Alcohol					<0.001Y*
Yes	3(16.7)	15(83.3)	18(37.5)		
No	22(73.3)	8(26.7)	30(62.5)		
Smoking					0.156Y
Yes	1(16.7)	5(83.3)	6(12.5)		
No	24(57.1)	18(42.9)	42(87.5)		

*Statistically significant, Y yates correction and F Fischer exact test

IASI, and at six weeks post injection using WOMAC was 77.1% and VAS 81.3%, and about half the number of participants still maintained good pain control at 3 months, with a WOMAC 47.9% and a VAS score of 56.3%. More patients in this study had sustained pain control at 3 months compared to subjects in the Pakistan study, where about 16.1% of the subject had about 50% reduction in pain up to the 3 months using WOMAC and about 38.7% had more than 50% reduction in pain using VAS.[1] It is clearly obvious, there is a large variation in both extent and duration of response to steroid

Using VAS score only age and alcoholic status had a significant association with outcome. (Table 4)

Table 4 Association between Demographic and Outcome at the end of study Based on VAS

Characteristics	Outcome		Total	$\chi 2$	P-value
	Poor	Good			
Age					0.029F*
<40	0(0.0)	2(100.0)	2(4.2)		
40-59	11(34.4)	21(65.6)	32(66.6)		
60-79	10(71.4)	4(28.6)	14(29.2)		
Sex					0.093Y
Male	3(21.4)	11(78.6)	14(29.2)		
Female	18(52.9)	16(47.1)	34(70.8)		
Education					0.567F
Primary	9(52.9)	8(47.1)	17(35.4)		
Secondary	9(42.9)	12(57.1)	21(43.8)		
Tertiary	3(30.0)	7(70.0)	10(20.4)		
Occupation					0.097F
Business	0(0.0)	4(100.0)	4(8.3)		
Civil servant	6(40.0)	9(60.0)	15(31.3)		
Housewife	10(66.7)	5(33.3)	15(31.3)		
Lecturing	0(0.0)	2(100.0)	2(4.2)		
Trading	5(41.7)	7(58.3)	12(25.0)		
BMI					0.921
Normal	2(33.3)	4(66.7)	6(12.5)		
Overweight	7(43.8)	9(56.3)	16(33.3)		
Obese	12(46.2)	14(53.8)	26(54.2)		
Systemic Hypertension					>0.999Y
Yes	10(41.7)	14(58.3)	24(50.0)		
No	11(45.8)	13(54.2)	24(50.0)		
Hepatitis B					>0.999Y
Yes	2(50.0)	2(50.0)	4(8.3)		
No	19 (52.3)	25(56.8)	44(91.7)		
Hepatitis C				0.738	0.390Y
Yes	7(53.8)	6(46.2)	13(27.1)		
No	14(40.0)	21(60.0)	35(72.9)		
Alcohol					0.009Y*
Yes	3(16.7)	15(83.3)	18(37.5)		
No	18(60.0)	12(40.0)	30(62.5)		
Smoking					0.322Y
Yes	1(16.7)	5(83.3)	6(12.5)		
No	20(47.6)	22(52.4)	42(87.5)		

*Statistically significant, Y yates correction and F Fischer exact test

injections, this study looked at the socio-demographic profile to determine if there is any relationship with response to IASI at 3 months. It found an association with 50% reduction in pain at 3 months using both the WOMAC and VAS score. The variables of socio-demographic profile which showed relationship are age, sex, and alcohol. The association with age and status of alcohol consumption was significant for both WOMAC and VAS scores while sex is only significant with WOMAC score. The relationship with age is inverse as the good response decreased with increasing age, this is like the finding in the Pakistan study which showed a negative correlation with age, indicating that a patient presenting with a greater age will show lesser response to IASI according to VAS.[1] In the same vein, we found out that alcoholics responded better than non-alcoholics using both WOMAC and VAS score, the reason for this is not known, but it could be because more of the alcoholics are of the younger age group. However, after running a logistic regression, none of the variables identified could predict the response at 3 months. Most studies including large systemic reviews have not found factors that could predict response at 3 months.[4,14]

Considering the foregoing, intra-articular steroid injection, as recommended by the American College of Rheumatology, is a valuable tool in the treatment of osteoarthritis of the knee in patients who have failed to respond to non-steroidal anti-inflammatory drugs and are not candidates for total knee replacement.

There are certain limitations to our study, it's a single centre experience and cannot represent the whole population. We are unable to compare blind vs. ultrasound-guided injection technique in Intra-articular steroid injection.

Conclusion.

We conclude that intra-articular steroid injections provide sustained response in patients with osteoarthritis of the knee who have failed analgesics and are not candidates for total knee replacement for up to three months and the response decreases with advancing age.

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Prevalence and Spectrum of cervical cytological abnormalities among Brothel based sex workers in Jos, Nigeria

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Abstract

Background: Cervical cancer is the second most common cause of cancer-related death among women in sub-Saharan Africa. Female sex workers being high-risk group are more susceptible to infections with the Human Papillomavirus and thus, the development of the premalignant and malignant disease of the cervix. We therefore sought to determine the prevalence and spectrum of cervical cytological abnormalities among female sex workers in Jos, Nigeria.

Methods: A cross-sectional study was conducted among Brothel based sex workers (BBSW) aged 18years and above in Jos, Nigeria between March 2018-February 2019. Papanicolaou test technique was the screening method used to detect premalignant lesions. Data were entered and analyzed using STATA version 15.1 software.

Results: A total of 201 participants were recruited for the study. One hundred and ninety-four (194) had adequate smears and were included in the analysis. Of this 80.4% were negative for intraepithelial malignancy, while 19.6% were positive for intraepithelial malignancy and this included ASCUS (10.3%), LSIL (4.6%), HSIL (3.6%), AGUS (0.5%) and ASC-H (0.5%). Abnormal cervical cytology was seen more in participants that were single, between the ages of 24-34years, multiparous, with a previous history of sexually transmitted disease, and have greater than 2 clients/day, but all these were not statistically significant.

Conclusion: Due to the high prevalence of abnormal cervical cytology among BBSW, there is a need for them to have regular screening, follow-up, and treatment of premalignant lesions to prevent progression to frank cervical cancer.

Keywords: female sex workers, Brothel based sex workers (BBSW), Abnormal cervical cytology, cervical intraepithelial neoplasia

Date received: 15 May 2022; accepted: 6 July 2022

Highland Med Res J 2022;22(1):15-19

Introduction

Cervical cancer is a preventable and curable disease as long as it is detected early and managed effectively. Yet it is the second cause of cancer-related mortality in women in low and middle-income countries. In 2020 more than 600 000 women were diagnosed with cervical cancer and 342 000 women died worldwide.[1] Nearly 90% of these deaths occurred in middle and low-income countries.[2] Almost all cases of cervical cancer are caused by persistent infection with oncogenic HPV infection, which is usually transmitted through sexual intercourse.[3,4]

Female sex workers are a group of women who exchange sex for money and are therefore at greater risk of HPV infection due to multiple and new sexual partners, smoking, use of alcohol, low educational and socioeconomic status, inconsistent condom use, and high prevalence of immunodeficiency syndrome.[5] Despite being a high risk and priority group for cervical cancer most of them are not regularly screened and followed up.[6,7] In 2020, the WHO adopted a global strategy for eliminating cervical cancer, through the triple pillar intervention strategy: 90% of girls to be fully vaccinated by the age of 15years, 70% of women to be screened by the age of 35years and again at 45years and 90% of women with precancer treated and 90% of women with invasive cancer managed.[8] To achieve this, high-risk population including female sex workers must be screened and treated for premalignant lesions of the cervix. In this study we determined the prevalence and spectrum of cervical cytological abnormalities among BBSW.

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Materials and Methods

Study design and study setting

A cross sectional descriptive study was carried out among brothel based sex workers **(**BBSW) in Jos North, central Nigeria over a period of one year between March 2018 -February 2019. Jos North local government area is the main commercial area and one of the 17 local government areas of the state with a well-organized brothel-based system was chosen for the study.

Study population

This included brothel-based sex workers 18years and above who consented to be part of the study. Sex workers that were not brothel-based were excluded from the study.

Sample size and sampling technique

The sample size was determined using a single proportion formula with a power of 80% and at a 95% confidence interval. The prevalence of abnormal

cervical cytology of 15% from a study done in Kenya was used.[9] To accommodate for inadequate or missed slides 10% was added, the final sample size was 187 but 201 participants were recruited for the study.

A two stage sampling technique was used. First Jos North was purposely selected because it is the main commercial area of the state. Secondly using a cluster sampling brothels were chosen.

Data collection and sample collection

Data on sociodemographic, sexual and reproductive history of the participants were collected by a trained counselor in a private area within the brothel, using interviewer administered questionnaires.

HIV test

HIV test was done for all participants using the Alere Determine HIV 1/2 Ag/Ab combo test to detect both HIV1/2 Antibodies. Reactive specimen was confirmed by trinity Biotech Unigold Recombigen HIV test. All participants who tested positive were referred for HIV treatment, care and support.

Cervical sample was collected by a female gynaecologist. Each woman was placed in dorsal position. The labia were parted with a gloved thumb and index fingers. A plastic disposable Cusco's bivalve speculum which was not lubricated with an antiseptic solution was used to visualize the cervix under bright light source. A cytobrush was used to obtain samples from the cervix and a smear was made on two pre labeled glass slides and immediately fixed in an alcohol jar containing 95% alcohol and this was later stained using the Pap Smear technique.

Interpretation of results

Pap smear results were evaluated and interpreted by two cytopathologist and classified according to the 2001 Bethesda system,[10] NILM (negative for intraepithelial lesions and malignancy) which includes inflammatory changes, organisms, atrophic changes and reactive changes; ASCUS (atypical squamous cells of undetermined significance); ASC-H (atypical squamous cells cannot exclude a high-grade squamous intraepithelial lesion); LSIL (low-grade squamous intraepithelial lesions); and HSIL (high-grade squamous intraepithelial lesions). Women with Pap smear abnormality were referred to a private facility in town for further evaluation.

Data analysis

Data was analyzed using Stata software version 15.1SE. Continuous variables were expressed as mean and standard deviation while categorical variables were expressed as percentages.

Prevalence and pattern of abnormal cervical cytology was determined. The primary outcome of interest was abnormal cervical cytology. Secondary outcomes included the sociodemographic, sexual and reproductive variables. A chi square test was done to determine the association between abnormal cervical cytology and participants sociodemographic, sexual and reproductive characteristics.

Ethical consideration

Ethical approval was obtained from the ethical committee of Jos University Teaching Hospital. Permission was obtained from brothel managers and cheerleaders and a written informed consent was obtained from each participant prior to recruitment into the study.

Results

Between March 2018 to February 2019, two hundred and one BBSW had cervical cytological screening using Papsmears technique. The smears were inadequate in 7 women and so were excluded from the analysis. Thus, 194 women with satisfactory smears were included in the final analysis.

The mean age of the women was 29.42±6.6, more than half of the women were between the ages of 24-34 years, single, consumed alcohol and had secondary level of education. Greater than 80% had a history of STI and more than 90% of the participants had more than two sexual clients per day. Only 4(2.1%) of the participants reported ever having a pap smear and prevalence of HIV was 19.6% (Table 1)

Prevalence and spectrum of cervical cytological abnormalities

Thirty eight of the women had abnormal cervical cytology giving a prevalence of 19.6%. Atypical squamous cells of undetermined significance constituted the highest class of abnormality accounting for 10.3%(n=20) of the abnormalities. This is shown in (Table 2).

The association between participants socio-demographic, sexual and reproductive characteristics was determined using chi square test and it was found that participants that were single, between the ages of 24-34years, multiparous, with a previous history of sexually transmitted infections and have greater than 2 partners/day had more cervical intra epithelial lesions but this was not statistically significant.

Table 1: Sociodemographic characteristics of brothel based sex workers in Jos Nigeria

Variables	Frequency (%)
Age(mean ±SD) 29.42±6.6	
Age group	
18-24	42(21.6)
25-34	111(57.2)
35-44	37(19.1)
≥45	4(2.1)
Parity(median IQR) 1(1,2)	
Parity group	
0	42(21.6)
1-4	146(75.3)
≥5	6(3.1)
Abortion(median IQR) 1,(0,2)	
Number of abortions	
0-3	172(88.7)
≥4	22(11.3)
Age at sexual debut(mean ±SD)16.5±2.9	
Age at sexual debut group	
<15	42(21.6)
≥15	152(78.5)
Partners/day (median IQR) 5(4,10)	
Partners/day group	
≤2	17(8.8)
>2	177(91.2)
History of previous STI	156(80.4)
Previous Pap smears	4(2.1)
Marital status	
Single	101(52.1)
Married	12(6.2)
Separated	46(23.7)
Divorced	9(4.6)
Widowed	26(13.4)
Smoking	23(37.6)
Alcohol	122(62.9)
HIV status	38(19.6)
Level of education	
None	14(7.2)
Primary	46(23.7)
Secondary	117(60.3)
Tertiary	17(8.8)

Discussion

The incidence and mortality of cervical cancer have reduced significantly in developed countries due to an organized cervical cancer screening system.[1] In low and middle income countries including Nigeria, screening are opportunistic and even with that some high risk population are less likely to be screened. In many societies female sex workers are poorly identified and due to a range of social and legal discrimination issues, they are less likely to present for regular cervical cancer screening or other routine health checkups.[6,7,11]

Table 2: Numbers and proportion of different cervical cytological findings according to the Bethesda 2001, classification

Papsmears finding	Frequency	Percentage	95% CI
NILM	156	80.4	74.2-85.4
ASCUS	20	10.3	6.7-15.4
LSIL	9	4.6	2.4-8.7
HSIL	7	3.6	1.7-7.4
AGUS	1	0.5	0.07-3.6
ASC-H	1	0.5	0.07-3.6

In this research we conducted cervical cancer screening using the Pap test. The prevalence of abnormal cervical cytology among BBSW in this study was found to be 19.6% this is comparable to findings earlier in Jos Nigeria by Sagay et al,[7] similar findings were also found in Mali[12] and Iran.[13] lower prevalence have been reported by Leung et al in Hong Kong[14] and as high as 36.1 % was reported in the Dominican republic.[15] The variations in the figures reported could be due to study specific characteristics such as age, geographical location, types of sex work either brothel or non-brothel based and type of Papsmears technique implored, either traditional or liquid based method. Sheyla et al in Dominican republic recruited both brothel and non-brothel based sex workers and used liquid based cytology rather than the traditional Papsmears technique.[15]

The most common abnormality detected was ASCUS followed by LSIL, this findings is similar to that found in Madagascar[16] and Hongkong.[17] Jia et al in China found higher prevalence of ASCUS (32.04%).[18]

Given the high prevalence of ASCUS and LSIL among BBSW there is a need to provide free or cost efficient HPV screening among this population. This will help in triaging and effectively managing those that will require follow up to prevent progression to frank cancers.

Participants that reported previous history of STI were found to have a higher prevalence of abnormal cervical cytology, this is in keeping with previous studies that found high rate of STIs among female sex workers.[19,20] This may be related to high rate of risky sexual behaviours like unprotected or inconsistent condom use, anal intercourse that makes them more vulnerable to infection.

Sagay et al[7] in Nigeria also reported high rate of infections among female sex workers especially those that douche. Douching is said to alter the normal vaginal flora by reducing the amount of lactobacillus, predisposing them to more cervical and pelvic infections.

Table 3: Association between participants characteristics and abnormal cervical cytology

Variables	Abnormal cytology(n / %)	Normal cytology (n / %)	P value
Age group			
18-24	8(4.1)	34(17.5)	0.612
25-34	19(9.8)	92(47.4)	
35-44	10(5.2)	27(13.9)	
≥45	1(0.5)	3(1.5)	
Parity group			
0	9(4.6)	33(17.0)	0.631
1-4	27(13.9)	119(61.3)	
≥5	2(1.0)	4(2.1)	
Abortion group			
0-3	33(17.0)	139(71.6)	0.694
≥4	5(2.6)	17(8.8)	
Age at sexual debut group			
<15	7(3.6)	35(18.0)	0.590
≥15	31(16.0)	121(62.4)	
Partners/day group			
≤2	4(2.1)	13(6.7)	0.668
>2	34(17.5)	143(73.7)	
History of previous STI			
No	5(2.6)	33(17.0)	0.265
Yes	33(17.0)	123(63.4)	
Previous Papsmears			
No	38(19.6)	152(78.4)	0.184
Yes	0	4(2.1)	
Marital status			
Single	20(10.3)	81(41.8)	0.662
Married	3(1.5)	9(4.6)	
Separated	6(3.1)	40(20.6)	
Divorced	2(1.0)	7(3.6)	
Widowed	7(3.6)	19(9.8)	
Smoking			
No	24(12.4)	97(50.0)	0.911
Yes	14(7.2)	59(30.4)	
Alcohol			
No	16(8.2)	56(28.9)	0.478
Yes	22(11.3)	100(51.5)	
HIV status			
No	28(14.4)	128(66.0)	0.244
Yes	10(5.2)	28(14.4)	
Level of education			
None	3(1.5)	11(5.7)	0.387
Primary	8(4.1)	38(19.6)	
Secondary	21(10.8)	96(49.5)	
Tertiary	6(3.1)	11(5.7)	

We also found that only 4(2.1%) of the participants have ever screened. This is consistent with findings among female sex workers and even in the general population.[7,21,22] Ilesanmi et al found that despite the high awareness about cervical cancer screening methods, screening was low due to poor accessibility and lack of interest and the sex workers preferred to be screened in their brothels rather than Public hospital.[21]

The limitations of this study include the fact that being a cross sectional study, we were not able to detect incident cervical abnormalities or determine the temporality of associations that were detected and there was no control population used in this study. Also a larger sample size would have increased the power of the study. There is a need for further longitudinal studies using high efficiency screening methods like HPV testing and using a larger population size in other to detect and manage premalignant lesions of the cervix among this high risk population. However, the study has some strength in that cervical smears were read by two independent cytopathologist and any discrepancies were resolved to ensure accurate diagnosis. HIV test was done for all the participants.

Conclusion

This study showed a high rate of abnormal cervical cytology among female sex workers. Female sex workers are a neglected population that deserve greater attention, because of their high risk behaviour, making them more prone to infections especially HPV infections leading to cervical abnormalities.

Acknowledgment

This study was supported by the Northwestern University, Chicago and Jos University research training program in HIV and malignancies grant project funded by Fogarty international center (FIC) of the National Institute of Health (D43TW009575). GEI received funding through an International Research Career Development Award from the NIH/FIC (grant #K43TW011416) that provided research-protected time for review and writing of this manuscript. The funding agencies cited here did not play a role in the design, collection of data, analysis, interpretation, and writing of this manuscript or decision to publish the results. The contents of this manuscript are solely the responsibility of the authors and do not necessarily represent the official views of NIH/Fogarty International Center. I would like to thank all the research assistants especially Mrs. Biodun and Mrs. Chinyere. Our special appreciation to all the participants of the study.

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Natural honey pre-treatment protect against immune suppression in cyclophospamide exposed wistar rats

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Abstract

Background :Honey is a natural compound with numerous therapeutic functions ranging from anti-inflammatory, anti-oxidant, anti-microbial, anti-hypertensive and hypoglycemic activities. The aim of this study was to investigate the immunomodulatory activity of natural honey on cyclophosphamide induced suppression of humoral immunity in Wistar rats.

Methods :Wistar rats with mean body weight of 125±25g were divided into 5 groups (1-5 ;n-5) Group 1 (control)received only saline ,while groups 2-5 were treated with 30mg /kg bw of Cyclophosphamide (Cyp)intraperitoneally on days 19, 20 and 21. Groups 3-5 received 1.0g, 2.0g and 4.0g per kg bw natural honey orally for 21days in addition to the Cyp injections. Rats were weighed pre-treatment and post-treatment respectively. Blood samples were collected for measurements of hematological parameters and serum immunoglobulin G and M concentrations. Spleen were harvested, weighed and measured respectively.

Results : Compared to the Control group , group 2 had significant reduction in haemoglobin concentration (10.6g /dl) , lymphocytes ($0.4x10^9$/L) and total white blood cells ($0.4x10^9$/L) counts. IgG and IgM concentrations were equally reduced at 960.4 ± 37.3mg/dL and 173.6±1.2mg/dL respectively. Body and spleenic weights, heamatological parameters and IgG concentrations were increased in groups 3-5 on a dose dependent manner ;the highest increase been observed in group 5. IgM concentration was significantly increased in groups 3-5 relative to group 2, but in reverse dose dependent style .

Conclusion :Natural honey pre -treatment with Cyp treatment improves haematological and leucocytic parameters as well as serum IgG and IgM concentrations, thereby potentially protecting tissues from the deleterious effects of short term Cyp treatment.

Key words :Cyclophophamide, Haematological parameters, Humoral immunity, Honey

Date received: 2 January 2022; accepted 6 July 2022

Highland Med Res J 2022;22(1):20-26

Introduction

Cancer is among the leading cause of death around the world, accounting for 13 percent of all global registered deaths; 70 percent of the death occuring in middle and low income countries ,with Nigeria recording about 10,000 cancer deaths and 250,000 new cases annually.[1] According to Global Cancer Incidence, Mortality and Prevalence,[1] [a database of the International agency for Research on Cancer (IARC) the global cancer burden stood at 18.1 million new cases with 9.6 million deaths in 2018 ;with 5-year prevalence estimated to be 43.8million . 57% of new cancer cases as well as 65% of cancer deaths in 2012 occurred in less developed regions of the world that included Central America and parts of Africa and Asia.[1] It is estimated that new cancer cases per year in 2030 shall rise to 23.6 million.[2] The number of patients across the world who will require first-line chemotherapy will rise to 15 million in 2040 (from 9.8 million in 2018) ; an increase of 53% [3].

Cyclophosphamide (Cyp) is one of the first line chemotherapeutic agents. It is a cytotoxic drug that suppresses both humoral and cellular immunity. Its immunosuppressive and cytotoxic effects may bring an impairment of host defence mechanism leading to significant morbidity and mortality, which is a major limiting factor in cancer treatment.[4] Since cytotoxic drugs affect dividing cells ,many of the side effects are concentrated on renewable tissue such as hair ,bone marrow ,and mucous membranes .The side effects vary from person to person, with the type and severity of the side effects depending on the drugs used, dosages and how the body responds to the drugs. The commonest side effects of cytotoxics include hair loss, nausea and damage to the mucosae of gastrointestinal tract, the mouth (resulting in diarrhea and mouth sores), damage to bone marrow with increased risk of infection and communicable diseases. Other systemic manifestations include fever, paraesthesia, encephalopathy, vomiting, constipation, interstitial pneumonitis, congestive cardiomyopathy, angina, heart failure, sterility, haemorrhagic cystitis. The negative side effects of chemotherapeutic treatments can severely impact the quality of life for patients and may result in discontinuation of therapy.[5] Therefore ,therapies which can prevent progression to malignancy, reduce the required dosage of conventional drugs, or lessen the severity of adverse effects are of considerable benefit.

Honey has been used for more than 2000 years as traditional medicine in different cultures due its nutritional and medicinal properties. Reports have

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highlighted multiple roles for honey in enhancing immune responses, including the induction of inflammatory cytokine production by macrophages,[6] stimulation of neutrophil migration and enhanced antibody production.[7] There are wide varieties of honey in use including manuka honey ,pasture honey ,jelly bush honey and jungle honey, etc., largely based on the flower sources.[8] Therefore ,this study was carried out to determine if the use of natural honey along with cyclosphosphamide can alleviate the side effects from the drug and improve quality of life of cancer patients.

Methods

Injectable Cyp, manufactured by Cadila[7] healthcare limited ,marketed by Zydus Celexa, India was procured and constituted as 500mg Cyp dissolved in 25mls of injection water for intraperitoneal injection. Immunoglobulin ELISA kits were equally procured for the study. All other reagents used were of analytical grade.

Freshly harvested honey without additives was purchased from a bee farm in Jato Aka, Benue State, Nigeria. The honey was dissolved in physiological saline solution and prepared freshly each time for treatment and administered orally.

A preliminary study was carried out to determine the effective immunosuppressant, but non-lethal dose of Cyp before commencement of treatment.[9]

Twenty five Wistar rats, aged 6-8 weeks (mean weight=125$\pm$25g) were procured from the disease free stock of the Animal house unit, College of Health Sciences, Benue State University (BSU), Makurdi and randomized into experimental groups 1-5 (n=5). The animals were housed in wooden cages and acclimatized for 10days before commencement of treatments. The rats were maintained in standard condition at room temperature and relative humidity. All the rats had free access to rat chow and portable water *ad libitum* and cared for in accordance with international guidelines for animal care.[10]

The treatment proctocol were as follows:

- Group 1 (control) Rats: Had intraperitoneum injection of 1ml of physiologic saline from days 1-21 each.
- Group 2 Rats: Had intraperitoneum injections of 1ml of physiologic saline from days 1-21, with 30mg/kg BW Cyp on days 19, 20, 21 each.
- Group 3 Rats: Had oral 1.0g/kg BW of honey from day 1-21 with injectable 30mg/kg BW Cyp on days 19, 20, 21 each.
- Group 4 Rats: Had oral 2.0g/kg BW of honey from day 1-21 with injectable 30mg/kg BW Cyp on days 19, 20, 21 each.
- Group 5 Rats: Had oral 4.0g/kg BW of honey from day 1-21 with injectable 3mg /kg BW Cyp on days 19,20, 21 each .

Each animal was weighed daily before treatment administration throughout the study period.[11] At the end of treatment period ,the animals were fasted overnight . Under chlorofoam anaesthesia[12], 5ml of blood samples were collected from each animal with 3ml separated into a plain vacutainer while the remaining 2ml was received into an EDTA bottle .Blood sample in the vacutainer was allowed to clot at room temperature and thereafter centrifuged at 3500 rpm at 4^{O}C (degrees Celsius) for 10min. The consequent supernatants (sera) was collected and stored at -20^{O}C for estimation of immunoglobulins G and M using ELISA techniques.[13] Estimation of haematological parameters was performed on the blood sample collected in the EDTA using the Diatron-Abacus 5 hematology analyzer[14].

Date obtained were compiled using Micosoft Excel 2016 and reported as mean $\pm$ SD .Differences between groups were estimated using one way ANOVA with Turkey *post hoc* test using SPSS software for windows version 21 (IBM. Corp, Armonk, N.Y(USA). Difference was considered significant when P=0.05.

RESULTS

Table 1 showed that rats treated with Cyp alone had a significant (P<0.05)weight loss compared to the Control while rats in groups 3-5 had significant (P<0.05)total body weight gain relative to those of group 2. However , this relative weight gain was still significantly lower (P<0.05)when compared with the Control group .

Similarly, the mean spleenic weight showed a significant (P<0.05)decrease in groups 2-5 compared to that of group 1. Honey pre treatment in groups 3-5 induced a significant (P<0.05)spleenic weight increase relative to group 2.

As shown in Table 2, there was significant (P<0.05) decrease in all the haematological parameters studied in group 2 (Cyp alone) compared to the Control group . Pre treatment with honey in groups 3-5 on the other hand caused a significant (P<0.05)improvement in the studied haematological parameters relative to group 2 findings in a dose dependent manner .These improved haematological parameters however ,were significantly lower (P<0.05) compared to those of Control group except for MCV in group 5 which showed insignificant relationship .

It was observed that there was significant (P<0.05) reduction in the mean concentrations of IgG and IgM in group 2 relative to the Control group (Table 3). On the

other hand ,pre -treatments with honey in groups 3-5 showed significant (P<0.05)elevation and depression of IgG and IgM concentrations respectively relative to group 2 in a dose dependent manner. The respective immunoglobulin concentrations were all significantly lower (P<0.05)compared to those of the Control group .

These findings suggest that short term Cyp treatment profoundly suppresses total body and spleenic weights, heamatological and immunological parameters in the Wistar rats. However, pre-treatment with honey tended to protect against Cyp-induced the haematological and immune suppression.

Table 1: Effect of Honey on Weight parameters in Cyp-induced immunosuppression in Wistar rats

Variable	Study group (Mean±SD				
	Control	30mg/kg Cyp	1g/kg honey + 30mg/kg Cyp	2g/kg honey+ 30mg/kg Cyp	4g/kg honey + 30mg/kg Cyp
Pre-treatment weight(g)	132.0±1.1	133.2±0.8	131.9±0.7	131.6±0.8	131.3±0.7
Post-treatment weight(g)	142.9±1.2	121.4±0.8*	139.3±0.9*#	140.3±0.7*#	140.6±0.6*#
Change in weight(g)	10.9±0.5	-11.8±0.8*	7.4±0.2*#	8.6±0.2*#	9.3±0.3*#
%Change in weight(g)	8.2±0.4	-8.8±0.6*	5.6±0.1*#	6.6±0.2*#	7.1±0.3*#
Spleen weight(g)	0.8±0.1	0.4±0.1*	0.5±0.1*	0.6±0.1*#	0.6±0.1*#

*Significantly different from control group with P<0.05, #Significantly different from 30mg/kg Cyp group with P<0.05, SD= Standard Deviation

Table 2: Effect of honey on Haematological parameters in Cyp-induced Wistar rats

Parameter	Treatment group (mean±SD)				
	Control	30mg/kg Cyp	1g/kg honey+ 30mg/kg Cyp	2g/kg honey+ 30mg/kg Cyp	4g/kg honey + 30mg/kg Cyp
WBC (10^9/L)	24.1±1.4	0.4±0.1*	1.1±0.03*	2.0±0.1*#	2.7±0.2*#
NEU (10^9/L)	2.0±0.1#	0.08±0.02*	1.1±0.01*#	1.4±0.03*#	1.6±0.01*#
LYMPH (10^9/L)	18.1±1.5	0.4±0.0*	1.0±0.02*	1.5±0.1*	2.5±0.1*#
MON (10^9/L)	1.7±0.4	0.06±0.02*	0.1±0.0*	0.1±0.01*	0.2±0.01*
RBC (10^{12}/L)	7.5±0.2	5.1±0.05*	5.6±0.2*#	6.0±0.1*#	6.6±0.2*#
PCV(%)	44.3±0.7	32.2±1.2*	35.8±0.7*#	36.9±0.5*#	38.3±0.5*#
HGB (g/dl)	15.8±0.6	10.6±0.5*	12.1±0.1*#	13.4±0.1*#	13.9±0.1*#
PLT (10^9/L)	553.5±7.5	371.7±9.2*	438.0±11.9*#	479.2±1.6*#	486.8±5.0*#
MCH (pg/cell)	20.5±0.6	16.4±0.25*	17.6±0.6*#	18.3±0.5*#	22.0±0.04*#
MCHC (g/dl)	40.0±0.5	31.7±0.5*	33.5±0.4*#	34.4±0.3*#	35.1±0.2*#
MCV (fl)	58.3±0.6	54.1±0.2*	55.0±0.2*	56.0±0.8*#	57.5±0.4#

*significantly different from control with p<0.05; # significantly different from 30mg/kg group SD= Standard Deviation
Values are expressed as Mean ± SD. Treated groups are compared with Control group. PCV = Packed Cell Volume; Hb = Haemoglobin; WBC = White Blood Cells; NEU = Neutrophils; LYMPH = Lymphocytes; MON = Monocytes; PLT = Platelets; RBC = Red Blood Cells; MCH = Mean Corpuscular Haemoglobin; MCHC = Mean Corpuscular Haemoglobin Concentration; MCV= Mean Corpuscular Volume

Table 3: Effect of Honey on Immunoglobulin concentration in Cyp-induced Wistar rats

Variable	Control	Variable Treatment group (Mean±SD)			
		30mg/kg CYP	1g/kg honey + 30mg/kg Cyp	2g/kg honey + 30mg/kg Cyp	4g/kg honey + 30mg/kg Cyp
IgG (mg/dL)	1496.7±54.7	960.4±37.3*	1099.2±50.3*#	1237.4±22.4*#	1342.7±15.4*#
IgM (mg/dL)	355.1±15.8	173.6±1.2*	247.6±7.3*#	201.6±4.4*#	197.3±1.3 *#

* significantly different from control with p<0.05; # significantly different from 30mg/kg Cyp group SD= Standard Deviation
IgG= immunoglobulin G, IgM= immunoglobulin M

DISCUSSION

The immunomodulatory activity of honey was explored by evaluating its effects on Cyp-induced immunosuppression .Cytotoxic agents are non specific in their actions ,targeting almost all cells in the body killing healthy cells as well as cancer cells .In the present study , short term treatment with Cyp induced total body weight loss by about 9% in the experimental animals. This finding is supported by other studies which showed significant body weight loss in mice with exposure to Cyp at 80mg/kg/d for 3 consecutive days,[15,16] while a 5-10mg/kg Cyp treatment for 28– 30 days (long duration treatment) by oral gavages induced an initial significant body weight loss followed by weight gain.[17] This is an indication of the cytotoxic properties of Cyp on cellular multiplication in growing tissues particularly. The mechanism of weight loss may be related to the effect of the metabolic product of Cyp. Cyp is metabolised by the liver cytochrome P450 mixed function oxidase system, converting it to hydroxycyclophosphamide, which is subsequently metabolized to aldophosphamide. Aldophosphamide is cleaved to the active alkylating agent phosphoramide mustard and acrolein. The phosphoramide mustard forms a highly reactive cyclic aziridinium cation, which can react with the N(7) of the guanine and cytidine DNA molecule. The two reactive moieties in the molecule can form intrastrand and interstrand cross-links DNA, thereby inhibiting DNA multiplication (hence mitosis)[18] and equally promoting cellular apoptosis.[19] The outcome of this cellular action is prevention of tissue growth as well as the promoting of tissue loss. Another possible mechanism underscoring Cyp-induced weight loss lies in the fact that Cyp's active metabolite acrolein can interfere with antioxidant defense system, leading to the production of highly reactive oxygen species (ROS), which are a group of free radicals.[20,21] that can oxidatively damage hepatic cells with the consequence of causing digestive abnormalities , thereby making the body prone to weight loss.

Similarly, significant reduction in the mean spleen weight induced by Cyp treatment was observed in this study. This finding is supported by findings of immune organ atrophy and weight in animals treated with Cyp[22] due to the fast depletion of lymphocytic population in the lymphoid tissues of the organ .[23] The physiological basis for this phenomenon equally lies in the ability of Cyp metabolite to induce cellular DNA injuries , especially in the fast replicating cells of the spleen (the major lymphoid organ) and bone marrow leading to apoptosis and atrophy in these organs.

These actions of Cyp, in addition to the induction of ROS by Cyp metabolite acrolein in the liver and bone marrow,[24] has a severe adverse outcome on the general population of myeloid cell lines, as evidenced by the global suppression (by about 30%) of haematological parameters with resultant anaemia, erythrocytopenia, pan leucocytopenia and thrombocytopenia .In a study,[25] a single intraperitoneal injection of 200mg/kg bw Cyp induced in significant decreases in total red blood cells (RBCs), white blood cells (WBCs), thrombocyte counts as well as the haematocrit values in CP-treated fish, lending support to the findings of the present study.

IgG and IgM are the major immunoglobulins that provide humoral immunity for body defense against pathogens. It was observed in that immunoglobulins G and M were significantly reduced in all the Cyp exposed groups compared to the concentrations in the Control group ,a finding that is consistent with observation made in a study that a high single dose Cyp injection depressed B lymphocytes and abolished their function on the 7th day in the spleen and bone marrow, subsequently causing reduction in immunoglobulin populations.[26] The observed pan leucocytopenia and hence neutropenia, monocytopenia and especially lymphocytopenia impact adversely on humoral immunity. This may pave way for overwhelming body infections. Elsewhere similar observations have been made by other researchers who reported an imbalance of various leukocytic subpopulations in the peripheral blood of mice exposed to Cyp.[27,28]

In addition to the afore-mentioned mechanisms of action of Cyp in affecting mitosis and promoting apoptosis, Cyp suppressively target B lymphocytes (hence depressed IgG and IgM) as well as disruption of cell adhesion molecules (CAM) and cytokines.[19] T cell absolute population are equally suppressed by Cyp,[4] while the fine balance between T helper cell 1 and 2 (Th1/Th2) subpopulations is completely lost.[29]

The observed suppressive actions of Cyp in this study were significantly ameliorated by honey pre-treatment of Cyp exposed animals with improvements in spleenic and body weights, immune and haematological parameters earlier depressed by Cyp treatments. Similar findings supporting the outcome of our present study have been documented in other studies which showed the positive effect of honey treatments on body weight, immune and heamatological indices.[25,30] This protective action of honey may likely be attributed to the intrinsic properties of honey, including its high osmolarity and acidity, as well as the presence of flavonoids (such as quercetin, catechin, kaempferol, luteolin, and apigenin) and phenolic acids (such as caffeic acid, ellagic acid, gallic acid, syringic acid, chlorogenic acid, p-coumaric acid, ferulic acid, and the fiavonoids chrysin, kaempferol, catechin, quercetin, galangin, luteolin, pinocembrin, pinobankskin, and myricetin)[31] which are responsible for its antibacterial and antioxidant

activities.[32]

Additionally, honey is known to contain over 200 compounds, consisting mainly of sugars (75% monosaccharides: glucose and fructose ; 10%-15% disaccharides: sucrose, maltose, etc.) and water, as well as enzymes, vitamins (Vitamin B6, ribofiavin, niacin, thiamine, etc.), minerals, volatile compounds, and pigments.[33] In addition to its antimicrobial, antioxidant and tissue-protective activities, Manuka, Pasture, Nigerian Jungle, and Royal jelly honeys are found to increase IL-1β ,IL-6, and TNF-α production.[7] There are over 300 varieties of honey recognized.[34] These varieties are defined by their components of the flower sources and the degree of protection offered by honey against Cyp effects was more dependent on honey type than its duration and dose.

The production of short-chain fatty acid (SCFA) by honey may also play a key role in the protective actions of honey on Cyp-induced side effects as fermentation agents of SCFA, especially nigero-oligosaccharides as well as other non-sugar ingredients, possess strong immunomodulatory properties.[35 35] Manuka and pasture honeys have strong demonstrable ability to stimulate the production of the cytokine tumour necrosis factor -alpha (TNF-α) cytokines ,interleukin-1 and 6 (IL-1β ,and IL-6) by cells.[6] TNF-α produced by bone marrow -derived macrophages (BMDM) and human monocytes is essential for macrophage activation, stimulation of angiogenesis and re-epithelialisation during early wound healing, a key activity in tissue recovery from Cyp effects. While cytokines equally play important role in wound healing, IL-6 enhances proliferation of keratinocytes and attract neutrophils while interleukin-1 (IL-1β), stimulates the release of important wound - healing growth factors. Production of TNF-α are potently stimulated by Type II arabinogalactan proteins (AGPs) also. AGPs, found in Kanuka honey, are derived from essential polysaccharide polymers found in the cell walls and tissues of plants and can be transported to honey from plants by bees during the honey -making process.[36] Thus, honey ameliorate Cyp induced haematological and immune suppressive effects on cells by inducing phenolic antioxidation and suppressing the production of ROS, which is a key marker of tissue inflammation.

Even though the study was well designed to satisfy the overall aim ,the study was by no means totally exhaustive and limited in scope owing to paucity of funds.

It is hereby recommended that Cyp use as cytotoxic therapy be preceeded by honey treatments as well as close monitoring of the individual to curb any debilitating side effects that may arise.

Acknowledgments

The authors wish to acknowledge the contributions of the Technical staff of Physiology, Haematology and Chemical pathology departments of College of Health Sciences , Benue state University Makurdi for their technical assistance in specimen extraction running the haematological and ELISA assays .

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Pattern of vernal keratoconjunctivitis and its complications amongst school pupils in Jos East local government area of Plateau State, North-Central Nigeria

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Abstract

Background: A common chronic allergic eye condition affecting children and young adults worldwide is vernal keratoconjunctivitis (VKC). It is mostly seasonal, and can affect the quality of life of affected children and their parents. This study aimed to determine the pattern of VKC and its possible complications among school pupils in Jos East Local Government Area (LGA) of Plateau State.

Methods: A school-based cross-sectional descriptive study using a multistage sampling technique was carried out. A 2X magnifying loupe was used to examine the eyes of the pupils. Statistical analysis was done using Statistical Package for Social Sciences (SPSS version 20), and frequency, simple percentages, and chi-square were used to compare proportions.

Results: A total of 400 participants were seen during the study. All types of VKC were seen, however, the limbal form was the commonest contributing 45.2% followed by the tarsal form (34.5%), and then the mixed type (20.0%). The pattern of VKC was found not to be significant when compared with age-group and gender of participants. The major complications associated with VKC were keratoconus and cornea scar, while the effect of VKC in the pupils was seen to cause difficulty in reading, difficulty concentrating on homework and other activities, feeling embarrassed, and difficulty playing with friends as effects of VKC on the quality of life of pupils.

Conclusion: The limbal form of VKC was found to be the commonest, while keratoconus and corneal scar were the commonest complications.

Recommendation: Parents need to be educated on this disease condition and the need to reduce its negative impact on a child's quality of life so as to improve school attendance and performance.

Key words: Vernal keratoconjunctivitis, pattern, complications, school pupils.

Highland Med Res J 2022;22(1):27-30

Introduction

Vernal keratoconjunctivitis (VKC) is a lingering, periodic inflammation of the conjunctiva and cornea that tends to occur in children and young adults.[1] In Nigeria the age group of 5 -19 years constitutes about 39.6% of the total population.[2] Thus, this age group is important since it forms the growing population, and whose potential dictates the country's future economy therefore cannot be neglected. A study on the pattern of VKC in school children is very important because while some eye conditions are just causes of ocular morbidity, VKC comes with intense itching, swollen eyelid, tearing, red eye, foreign body sensation, mucous discharge, photophobia and other complications which may lead to blindness.[3] The most common signs of VKC are lid edema, chemosis, tarsal papillae, Horner-Trantas dots, limbal infiltrates (limbitis), giant papillae, and corneal epitheliopathy.[4,5]

VKC is divided into two main types depending on the part of the conjunctiva involved: tarsal or limbal. Tarsal VKC is characterized by the presence of giant papillae > 1mm in diameter while the limbal type by the presence of papillae, limbal infiltrates, and Horner-Trantas dots. A combination of both signs is classified as mixed. The limbal form is more common in tropical climes and it typically involves both eyes while unilateral cases tend to be the tarsal form of VKC.[3,6-8]

Pattern of VKC varies with gender. In a retrospective non-comparative case series,[3] the tarsal type was found to be more predominant in boys, while the limbal type was common in females.

There is a dearth of data on pattern of VKC and its complications among school pupils in Plateau State. The earlier studies done on VKC in Plateau State were hospital based studies. Hence, this study was designed to determine the relationship between the pattern of VKC across age groups and gender, and also to identify the complications of VKC among school pupils in Jos East LGA of Plateau state.

Methodology

This was a school-based cross-sectional descriptive study conducted over a four month period from October 2019 to January 2020 (4 months) in Jos East Local Government Area (LGA) of Plateau State. The population for the study constituted all primary schools within the LGA with a total of 113 primary schools of which 76 were public and 37 private. The total enrolment was 22,812 out of which 19,698 were enrolled in the public primary schools while 3114 were enrolled in the private primary schools. These schools are divided into 5 educational districts namely Maigemu, Fobur, Shere, Fursum, and Federe. The list of grouped schools was obtained from the Education Authority. From each

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district, five schools were chosen randomly by balloting from the list of schools. In each school, a class was chosen randomly by balloting from each arm running through primary one to primary six. A total of 400 participants were selected using the systematic random sampling method with 16 students recruited from each class.

Permission for the study was obtained from the Ethical and Research committee of the Jos University Teaching Hospital, and Plateau State Ministry of Education through the Area inspectorate of Education in Jos East LGA. Signed consent was obtained from the pupils' parents/guardian.

A self-developed semi-structured, interviewer-administered questionnaire with sections on demographic data of the pupil, clinical, medical and family history was used as the instrument for the study. Other instruments used included non-illuminated Snellen chart, non-illuminated tumbling E chart, pen torch, 2% fluorescein strip, direct ophthalmoscope, magnifying loupe 2X, Jackson cross cylinder, stationery, 0.5% amethocaine, cotton wool, pen torch with blue filter, and six (6) meter rope. Pupils with visual acuity of > 6/18 were considered to have normal vision.

Statistical analysis was done using Statistical Package for Social Science (SPSS) version 20 (IBM Corporation, Chicago, Illinois, USA). Frequencies and simple percentages were used to analyse the pattern and complications of VKC.

RESULTS

A total of 400 children participated in this study representing a response rate of 100%. The mean age of the pupils was 8.8±2.9 years and 8.7±3.1 years for males and females respectively. Males were more in this study with a male to female ratio of 1.3:1. VKC was seen in 84 out of the 400 children, resulting in a prevalence of 21.0% (Figure 1).

Table 1: Pattern of VKC in relation to Age and Gender group of pupils (n=84)

Variable	Pattern of VKC			$\chi 2$	p
	Tarsal n (%)	Limbal n (%)	Mixed n (%)		
Age group (years)				3.177	0.204
5-10	24(38.7)	28(45.2)	10(16.1)		
11-15	5(22.7)	10(45.5)	7(31.8)		
Total	29(34.5)	38(45.2)	17(20.2)		
Gender				0.327	0.849
Male	21(35.6)	27(45.8)	11(18.6)		
Female	8(32.0)	11(44.0)	6(24.0)		
Total	29(34.5)	38(45.2)	17(20.2)		

All the three types of VKC were seen in the study. The commonest sub-type was limbal 45.2%. (Table 1) All the three types of VKC were seen in both males and females. However, there was no statistically significant difference in the pattern of VKC distribution compared with gender (P = 0.849). (Table 1)

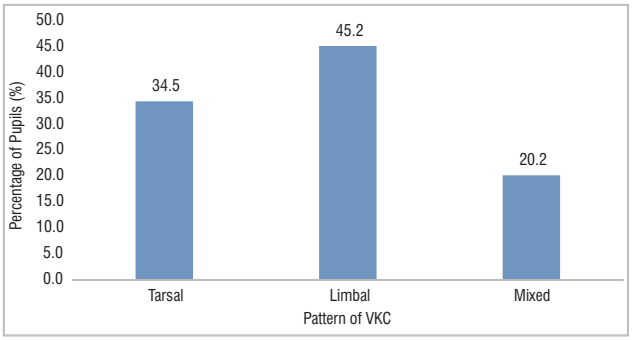

Figure 1: Pattern of VKC among school pupils in the study population.

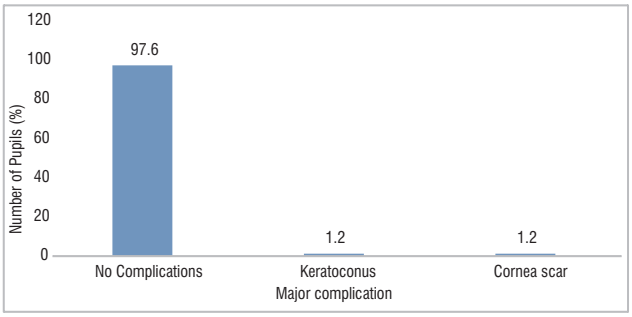

Figure 2: Complications associated with VKC (n=84)

The major complications associated with VKC were keratoconus and cornea scar (Figure 2). The major effects of VKC on the quality of life of pupils were difficulty in reading, 20.2%, difficulty in concentrating on homework and other activities, 19.0%, and feeling embarrassed and difficulty playing with friends, 19.0%, (Figure 3)

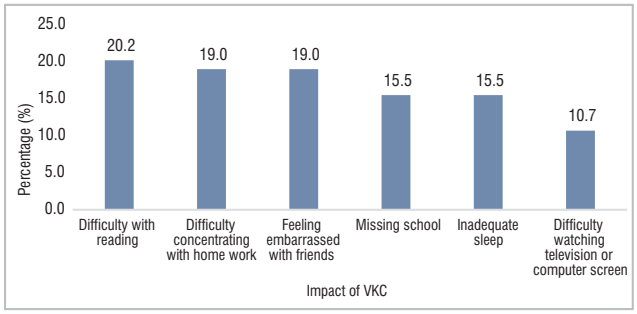

Figure 3: Effect of VKC on pupils' quality of life (n=84)

Out of 84 pupils with VKC, the majority (86.9%) had normal vision (>6/18) (Figure 4)

The most frequently encountered symptoms in the study were tearing and eye itching (43.1%), then foreign body sensation (15.3%) (Figure 5).

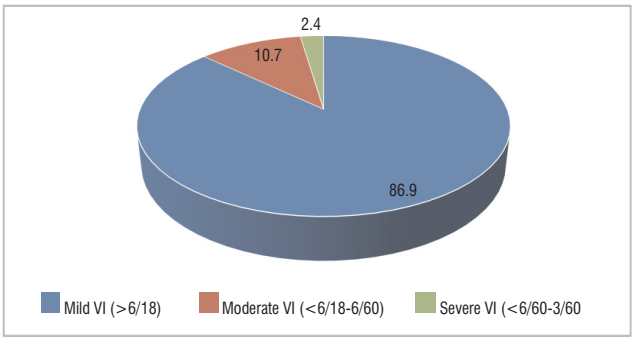

Figure 4: Presenting visual acuity (n = 84)

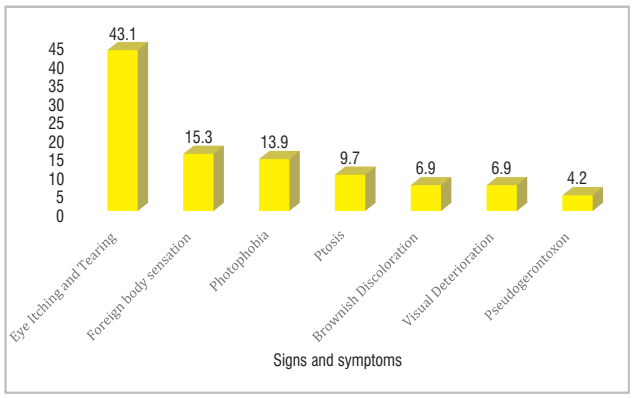

Figure 5: Clinical features of VKC in affected pupils

DISCUSSION

All three patterns of VKC were seen in this study. About half of the children seen in this study had the limbal sub-type of VKC, this picture was seen in both genders. The predominance of the limbal form of the disease was also reported by Fekadu, et al[9] in Ethopia, and Malu KN in Jos.[12] Our finding, however, contradicts the reports by Sethi, et al[18] in India who reported a predominance of mixed VKC and Duke et al [10] in southeast Nigeria who reported predominance of the tarsal form of VKC. It has been suggested that differences in environmental factors can lead to the predominance of a particular sub-type as can be seen in our study and the one by Malu et al [12] conducted in Northern Nigeria where the weather is dusty and dry, having more of the limbal subtype. It has also been suggested that progressive increase in environmental temperature in a hot and dry climate may be one of the factors that encourages exacerbation of disease especially the limbal type.[10] These discrepancies might also probably be due to different hormonal and hereditary.[1] Difference in study designs and study population might also contribute to specific type of VKC seen.

The commonest complaints in the children with VKC in this study were eye itching and tearing. A similar pattern was reported in other population-based studies, and the hospital-based study in Jos.[10,11,12,16,18,20.] This contradicts the report of Alemayehu et al[1] who noticed intense itching to be the commonest presentation seen in all participants. Itching and tearing also contributed to non-school attendance by the pupils in this study, similar to finding by Duke et. al.[10]

Most of the pupils 86.9% had normal vision in this study irrespective of the severity of their VKC. This agrees with the study done by Duke et al[17] in South-Eastern Nigeria that also found normal vision in most of the children seen with VKC. It also agrees with the study done by Surekha et al[22] where normal vision was seen in 82% of cases. Less than 1% of the pupils in this report had visual disturbance and this was due to the corneal complications of VKC. The corneal complications were keratoconus and corneal scar presenting separately in each of those pupils. The Yemen study also recorded cases of corneal scars and keratoconus.[15] as well as study done by Sureka et.al [22] None of the pupils in this study had other major complications like corneal ulcer, steroid induced cataract or glaucoma, and none was blind as a result of the disease process which contradicts with finding from study done by Cameron et al[15] and Surekha et al[22] who discovered these other complications associated with VKC in their studies. This low occurrence of corneal complications in this study is similar to findings in Jos,[12] Yemen,[19] and Italy.[20] It, however, contradicts the report by Surekha et al[22] who found a high cornea complications (21%) with corneal scaring from chronic itching and rubbing of the eye being the most common, and keratoconus being the least common.[22] Corneal involvement is associated with more severe disease. Corneal ulcer is reported to occur in 3–11% of patients with VKC and permanent reduction in visual acuity as a result of corneal changes in 6% of patients.[14] Prompt recognition of corneal involvement is vital in order to prevent visual loss from VKC.

Acquired ptosis was found to be quite common in this study, occurring more frequently with tarsal VKC. This is in agreement with the findings of Duke et al.[17] It was also a common complication seen by Surekha et al. [22] Ptosis in VKC could be as a result of frequent rubbing or chronic inflammatory insult to the levator palpebrae superioris muscles with subsequent dis-insertion, and also giant papillae.

Pseudogerontoxon was seen in 4.2% of the children in our study which is similar to the low rate of 3% that was reported in the study done by Surekha et. al.[22] It is often the only clinical evidence of previous allergic eye disease.[17] This lesion looks like a small segment of arcus

senilis.[17] The effect of VKC on pupils quality of life translates to poor school attendance, this was seen to have contributed to 22.9% of absenteeism in this current study. The disease condition had an effect on the self-esteem, emotional well-being, and concentration/ performance of the children with VKC seen in this study. This agrees with reports by De Smedt, et al[22] in Rwanda who also found an increase in non-school attendance in this group of students.

Conclusion

All the three types of VKC namely limbal, tarsal and mixed were found in the sample participants of this study. The pattern of VKC was not statistically significant in the distribution within gender and age group variables. Irrespective of the prevalence of VKC, less than 1% of the students seen had visual disturbance and this was as a result of corneal complications. Proper recognition of the corneal complications of VKC is crucial as most of these can be managed or prevented by a combination of medical and surgical measures. Parents need to be educated on the burden of VKC and its negative impact on the child so as to encourage early presentation to the hospital for treatment.

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Screening for Postpartum Depression among women in selected hospitals in Kaduna, Northern Nigeria: a cross sectional study

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Abstract

Background: Postpartum depression (PPD) is better detected early and treated to prevent maternal and perinatal complications. However, PPD screening is not routine in our environment. The aim of the study was to screen for those at risk of postpartum depression among women attending postnatal clinic.

Methods: A cross sectional study carried out in selected hospitals in Kaduna. A questionnaire was administered to women during their 6 weeks postpartum clinic visit and information elicited on demographics, reproductive characteristics, potential confounders for PPD, and the Edinburgh postpartum Depression Scale, administered. Analysis was done using SPPS (Statistical Package for Social Sciences) with a *p*-value of <0.05 deemed statistically significant.

Results: There were 300 participants. Majority of respondents were aged 20-29years (170, 56.7%), mean age was 27.51 ±5.759 years. Respondents were mostly well educated with 162 respondents (54%) schooled up to tertiary level, Muslim (224, 74.7%), Hausa (160,53.3%) and employed (172, 57.3%). All respondents were married, with most (266, 88.7%) in a monogamous setting and had been married for <10 years (251,83.7%). Only 17 respondents (5.7%) were at risk of PPD (EPDS score ≥13), while 41 respondents (13.7%) had signs of distress (EPDS score 10-12). Ethnicity, parity, baby's birthweight, baby not alive and experience of a recent stressful event were the only confounders significantly associated with the risk of PPD.

Conclusions: Among respondent, 5.7% had a high risk for PPD, which is lower than what was reported in previous studies. Ethnicity, parity, birthweight, death of the baby and experience of a recent stressful were significantly associated with this risk.

Keywords: Screening, Postpartum depression, Edinburgh postpartum Depression Scale (EPDS), Northern Nigeria

Highland Med Res J 2022;22(1):31-38

Introduction

Postpartum depression (PPD) is a condition commonly encountered in clinical practice.[1] Sometimes pregnancy, delivery, and the care of a newborn can take an excessively big toll on the mother. Maternal blues (or sadness) affects approximately 50-80% of women in the puerperal period, with about 20% of these women developing postpartum depression.[2] However, incidence varies widely in different countries. In Nigeria reported incidence of PPD varies from 14 -45% [3, 4, 5, 6, 7] but most go undetected.

Several factors may contribute to the development of PPD. One of such factors are hormonal changes in the postpartum period. These include a sharp fall in oestrogen, progesterone and thyroid hormones, increased levels of prolactin and decreased dopamine.[1] Other risk factors for PPD include personal and family history of depression, breastfeeding difficulties, poor socioeconomic status, unintended pregnancy, African race, domestic violence, lack of partner or family support, difficult delivery, or adverse obstetric outcomes. [1, 8]

Clinical features of PPD are like those of "maternal blues" with varying symptoms like insomnia, irritability, crying outbursts, overwhelming feelings, and emotional lability, but tends to persist for longer periods of over 2 weeks.[1,8] In severe PPD, symptoms can still occur anytime during the first year after birth, and mimic severe depression: sadness, loss of interest, difficulty concentrating, psychomotor agitation or slowness, excessive tiredness, appetite disorders, sleep disturbances, decreased libido, suicidal thoughts, ambivalent or negative feelings towards the baby, feelings of guilt about the inability to take care of the child and excessive anxiety. [1, 8]

Screening for PPD is important because it can lead to poor bonding between mother and baby, which may affect childcare and development; babies are slower in acquiring language, age-specific behaviours, and mental development.[1, 8] And in the mother, long-term depression may develop. Also, early detection and treatment leads to faster recovery, less chances of depression recurrence and better child development. [1, 8]

Treatment modalities usually include counselling and supportive therapy, antidepressant medication and cognitive - behavioural therapy.[1,8] Other possible treatments have been poorly studied such as oestrogen therapy, phototherapy, and omega-3 fatty acid

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supplementation. Family support is equally important.[1,8] PPD may be under reported in our environment since routine screening is not widespread and women may not report symptoms due to cultural reasons and stigma attached to mental illnesses. This study aimed to screen and determine the number of women at risk of PPD among women attending postnatal clinic and to understand factors associated with this risk.

Methodology

The study was carried out in three selected hospitals: the Kaduna Polytechnic clinic and Dan Tsoho General Hospital, and the Barau Dikko Teaching hospital Kaduna. All hospitals are located within Kaduna metropolis and were selected for convenience, provide secondary/tertiary level of care, and have a high patient load of obstetric patients.

This was a cross- sectional survey. The study population were women seen at the postpartum clinic 6 weeks after delivery at the selected hospitals in Kaduna.

All women in in their puerperium seen during their second postpartum visit (6 weeks) and gave informed consent for participation were included irrespective of their parity or mode of delivery.

Women seen after 6 weeks postpartum, or too ill to participate were excluded from the study.

The minimum required sample size was determined to be 272 using relevant statistical formula; $n = z^2pq / d^2$ using the prevalence rate of 23% for Maternal depression from a previous study.[10] A 10% no response/poor response rate was calculated as 27 (using 10% of the calculated sample size), hence total study sample size was 299, and rounded up to 300.

Convenient sampling of consecutive consenting women was done.

A questionnaire with two sections was used. The first section, a semi-structured questionnaire designed by the authors, contained basic information on socio-demographic and reproductive characteristics, pregnancy and delivery history including risk factors for PPD. The second section is the Edinburgh postpartum Depression Scale (EPDS) a validated screening tool used for early detection of PPD and found to be acceptable to women in cross-cultural research on depression, including studies done in Nigeria.[11,12] The questionnaire was self-administered but a trained research assistant was available to help if required. The EPDS section was also translated to Hausa, the language predominant in the region, by the process of back translation by a Lecturer in the Hausa department of the Kaduna State University (KASU). The total EPDS score was calculated (maximum of 30) and a score of less than 10 indicated no risk of PPD, score of 10 to 12 indicated maternal distress, while a score of 13 and above indicated depressive symptoms/a high risk of PPD.[13, 14, 15] Women at risk of PPD, or requiring further monitoring were counselled and referred to the mental health department for further diagnosis, monitoring and treatment as required.

Analysis was done using IBM SPPS Statistics 22 (Armonk, NY: IBM Corp). Simple descriptive statistical analysis was done using frequencies, percentages, and cross-tabulation. Chi-square test and likelihood ratio was used to test for association as required. A *p*-value of < 0.05 was deemed to be statistically significant.

Ethical approval was obtained from the Health Research Ethic Committee of the Kaduna State Ministry of Health and Human Services, Kaduna State, Nigeria, participating hospitals, and informed consent from participants. The study was voluntary with privacy ensured, posed no risk to participants, and all information was kept confidential.

Results

There were 300 respondents and table 1 shows their demographic characteristics. Majority of respondents were aged between 20-29years (170, 56.7%), mean age was 27.51 ±5.8 years,. Respondents were mostly well educated with 162 respondents (54%) schooled up to tertiary level, Muslim (224, 74.7%), Hausa (160,53.3%), employed (172, 57.3%). All respondents were married, with most (266,88.7%) in a monogamous setting and had been married for <10 years (251,83.7%).

Several factors such as reproductive characteristics and pregnancy outcomes that may affect PPD are shown in table 2. Among respondents, 260 (86.7%) had planned pregnancies, 264 (88%) had no pregnancy complications, 272 (90.7%) were singleton pregnancies, 232(77.3%) had spontaneous vertex delivery, 250 had term pregnancies (83.3%), 156 (52%) had male babies, 239(79.7%) had babies of normal birth weight, 257 (85.7%) had babies who did not require Neonatal Intensive Care Unit (NICU) admissions, 285 (95.0%) had their babies alive as of the time of interview, 279 (93%), had no recent stressor events, 290 (96.7%) had no previous history of PPD, 289 ((96.3) felt they had adequate social support, 292 (96.3%) reported they did not experience any domestic violence, only one respondent (0.3%) admitted to smoking, 292 (97.3%) did not abuse drugs, and 290(96.7%) had good quality relationships with their partner.

The mean EPDS score for respondents was 6.18 ± 4.16. Only 17 respondents (5.7%) were at risk of PPD (EPDS score ≥ 13), while 41 respondents (13.7%) had signs of distress (EPDS score 10-12) (Table 2, Figure 1). Table 3, 4, 5 and 6 shows association of demographic, reproductive, foetal characteristics and other risk factors with depressive symptoms using PPD cut off scores of 10 and 13. Ethnicity, parity, baby's birthweight, baby not alive and experience of a recent stressful event were the factors significantly associated with the risk of PPD

(Table 3, 4, 5, 6). Only religion was significantly associated with the presence of both distress and depressive symptoms (EPDS score ≥13) (Table 3).

Table 1: Demographic characteristics of respondents

Characteristic (n=300)	Frequency (%)
Age (in years)	
≤ 20	17 (5.7)
20-29	170 (56.7)
30-39	99 (33.0)
≥40	5 (1.7)
Missing	9 (3.0)
Education	
Primary	10(3.3)
Secondary	123(41.0)
Tertiary	162(54.0)
Missing	5(1.7)
Religion	
Christianity	73(24.3)
Islam	224(74.7)
Missing	3(1.0)
Ethnicity	
Hausa	160(53.3)
Igbo	13(4.3)
Yoruba	23(7.7)
Others	95(31.7)
Missing	9(3.0)
Employment status	
Employed	172(57.3)
Unemployed	108(36.0)
Missing	20(6.7)
Type of marriage	
Monogamy	266(88.7)
Polygamy	15(5.0)
Missing	19(6.3)
Duration of marriage	
<10years	251(83.7)
≥10years	33(11.0)
Missing	16(5.3)

Discussion

This study looked at the screening of women for PPD which is an important component of maternal care but is yet to be routine in this environment, despite its benefits to the mother, her baby, and the health system.

For this study, we used an EPDS cut off point of 13 to indicate those at risk of PPD and found the prevalence of PPD to be 5.7%. If we used the lower cut off point of 9, the prevalence of PPD increases to 19.3%. Positive screening scores may increase but does not directly equate to a diagnosis of PPD, as further diagnostic criteria need to be applied by relevant experts. The lower cut-off points increase the sensitivity of the EPDS screening tool to 100%, and specificity to 88%, while the higher/stricter cut-off points indicate a better and greater probability of depression, though does not measure the severity of the symptoms.[16]

Table 2: Reproductive, pregnancy and other characteristics that are potential risk factors for PPD.

Characteristic (n=300)	Frequency (%)
Parity	
1 (Primipara)	86(28.7)
2-4 (Multipara)	177(59.0)
≥5 (Grandmultipara)	25(8.3)
Missing	12(4.0)
Previous miscarriage	
None	219(73.0)
1	59(18.6)
2	11(3.7)
≥3	11(3.7)
Current pregnancy is planned?	
No	21(7.0)
Yes	260(86.7)
Missing	19(6.3)
Pregnancy complications	
No	264(88.0)
Yes	36(12.0)
Type of pregnancy	
Singleton	272(90.7)
Multifoetal	12(4.0)
Missing	16(5.3)
Mode of delivery	
Caesarean	68(22.7)
Vaginal	232(77.3)
Gestational age at delivery	
Preterm	22(7.3)
Term	250(83.3)
Missing	28(9.3)
Baby's sex	
Female	142(47.3)
Male	156(52.0)
Both (multifetal)	2(0.7)
Birthweight	
Low birth weight (<2.5kg)	30(10.0)
Normal birth weight (>2.5 - <4kg)	239(79.7)
Macrosomia (>4kg)	14(4.7)
Missing	17(5.7)
NICU admission	
No	257(85.7)
Yes	12(4.0)
Missing	31(10.3)
Baby alive	
No	15(5.0)
Yes	285(95.0)

Table 2: Reproductive, pregnancy and other characteristics that are potential risk factors for PPD. Contd.

Characteristic (n=300)	Frequency (%)
Recent stressful event	
No	279(93.0)
Yes	17(5.7)
Missing	4(1.3)
History of depression	
No	290(96.7)
Yes	6(2.0)
Missing	4(1.3)
Lack of social support	
No	289(96.3)
Yes	6(2.0)
Missing	5(1.7)
History of domestic violence	
No	292(97.3)
Yes	1(0.3)
Missing	7(2.3)
Smoking status	
No	293(97.7)
Yes	1(0.3)
Missing	6(2.0)
Poor quality relationship of partner	
No	290(96.7)
Yes	10(3.3)
History of drug abuse	
No	292(97.3)
Yes	8(2.7)
PPD Scores	
<10 (No risk)	242(80.7)
10-12 (Maternal distress)	41(13.7)
≥13 (Depressive symptoms)	17(5.6)

Our PPD prevalence of 5.7% was much lower that what was found in other Nigerian studies. Obindo et al[3] reported a prevalence of 44.5% in north central Nigeria, while Ukaegbe et al[6] reported a prevalence of 30.6% in southern eastern Nigeria. Uwakwe et al[11] however reported a lower PPD prevalence rate 10.7% in South-Eastern Nigeria. Other Nigerian studies reported variable rates of 14 -28%. [4, 5, 7, 11, 12, 17, 18, 19] Globally there are also varied prevalent rates reported for PPD; 7% in Uganda and16-35% in Zimbabwe,[20] 17.9% in Egypt, [21] 18% in India,[22] 41% in Thailand, [23] 28% - 57% in Pakistan, [24] 35% - 47% in Latin America.[25] The disparity in PPD rates reported by these studies may be partly explained by the fact that they used varying EPDS PPD cut off points (of 9, 10,11, 12 or 13) to screen, use of different methodologies and PPD screening tools, administration of screening tools at deferent times (antenatally, immediately after birth, to days and 6-8 weeks after birth), different study settings with varying sociocultural contexts that make exact comparisons difficult.

Table 3: Association Between Demographic Characteristics and Depressive Symptoms

Characteristic (n=300)	Depressive symptoms (PPD score ≥13)		Combined distress and depressive symptoms (PPD score ≥10)	
	Frequency (Row %)		Frequency (Row %)	
	No	Yes	No	Yes
Age (in years)				
≤ 20	13(76.5)	4(23.5)	12(70.6)	5(29.4)
20-29	161(94.7)	9(5.3)	138(81.2)	32(18.8)
30-39	96(97.0)	3(3.0)	80(80.8)	19(19.2)
≥40	5(100.0)	0(0)	4(80.0)	1(20.0)
Missing	8(88.9)	1(11.1)	8(88.9)	1(11.1)
	Likelihood ratio - 8.492		Likelihood ratio - 1.469	
	df - 4, p value - 0.075		df - 4, p value - 0.832	
Education				
Primary	9(90.0)	1(10.0)	9(90.0)	1(10.0)
Secondary	119(96.7)	4(3.3)	102(82.9)	21(17.1)
Tertiary	151(93.2)	11(6.8)	127(78.4)	35 (21.6)
Missing	4(80.0)	1(20.0)	4(80.0)	1(20.0)
	Likelihood ratio - 3.427		Likelihood ratio - 1.590	
	df - 3, p value - 0.330		df - 3, p value - 0.662	
Religion				
Christianity	67(91.8)	6(8.2)	52(71.2)	21(28.8)
Islam	213(95.1)	11(4.9)	187(83.5)	37(16.5)
Missing	3(100.0)	0(0)	3(100.0)	0(0)
	Likelihood ratio - 1.387		Likelihood ratio - 6.230	
	df - 2, p value - 0.500		df - 2, p value - 0.044	
Ethnicity				
Hausa	153(95.6)	7(4.4)	130(81.3)	30(18.7)
Igbo	9(69.2)	4(30.8)	6(46.2)	7(53.8)
Yoruba	21(91.3)	2(8.7)	18(78.3)	5(21.7)
Others	92(96.8)	3(3.2)	81(85.3)	14(14.7)
Missing	8(88.9)	1(11.1)	7(77.8)	2 (22.2)
	Likelihood ratio - 10.565		Likelihood ratio - 9.181	
	df - 4, p value - 0.032		df - 4, p value - 0.057	
Employment status				
Employed	163(94.8)	9(5.2)	139(80.8)	33(19.2)
Unemployed	103(95.4)	5(4.6)	86(79.6)	22(20.4)
Missing	17(85.0)	3(15.0)	17(85.0)	3(15.0)
	Chi square - 3.537		Chi square - 3.537	
	df - 2, p value - 0.171		df - 2, p value - 0.853	
Type of marriage				
Monogamy	251((94.4)	15(5.6)	215((80.8)	51(19.2)
Polygamy	15(100)	0(0)	15(100)	0(0)
Missing	17(89.5)	2(10.5)	16(84.2)	3(15.8)
	Likelihood ratio - 2.429		Likelihood ratio - 0.641	
	df - 2, p value - 0.297		df - 2, p value - 0.726	
Duration of marriage				
<10years	236(94.0)	15(6.0)	201(80.1)	50(19.9)
≥10years	33(100.0)	0(0)	28(84.8)	5(15.2)
Missing	14(87.5)	2(12.5)	13(81.3)	3(18.7)
	Likelihood ratio - 4.953		Chi square - 0.429	
	df - 2, p value - 0.084		df - 2, p value - 0.798	

Table 4: Association Between Reproductive Characteristics and Depressive Symptoms

Characteristic (n=300)	Depressive symptoms (PPD score ≥13)		Combined distress and depressive symptoms (PPD score ≥10)	
	Frequency (Row %)		Frequency (Row %)	
	No	Yes	No	Yes
Parity				
0	81(94.2)	5(5.8)	70(81.4)	16(18.6)
1-4	169(95.5)	8(4.5)	143(80.8)	34(19.2)
>4	25(100.0)	0(0)	21(84.0)	4(16.0)
Missing	8(66.7)	4(33.3)	8(66.7)	4(33.3)
	Likelihood ratio - 12.008		Likelihood ratio - 1.526	
	df - 3, p value - 0.007		df - 3, p value - 0.676	
Previous miscarriage				
None	207(94.5)	12(5.5)	180(82.2)	39(17.8)
1-2	65(92.9)	5(7.1)	53(75.7)	17(24.3)
≥3	11(100.0)	0(0)	9 (81.8)	2(18.2)
	Likelihood ratio - 1.563		Chi square - 1.437	
	df - 2, p value - 0.458		df - 2, p value - 0.501	
Current pregnancy is planned?				
No	20(95.2)	1(4.8)	14(66.7)	7(33.3)
Yes	245(94.2)	15(5.8)	213(81.9)	47(18.1)
Missing	18(94.7)	1(5.3)	15(78.9)	4(21.1)
	Likelihood ratio - 0.043		Likelihood ratio - 2.592	
	df - 4, p value - 0.978		df - 2, p value - 0.274	
Pregnancy complications				
No	251(95.1)	13(4.9)	213(80.7)	51(19.3)
Yes	32(88.9)	4(11.1)	29(80.6)	7(19.4)
	Likelihood ratio - 1.866		Likelihood ratio - 0.001	
	df - 1, p value - 0.172		df - 1, p value - 0.986	
Type of pregnancy				
Singleton	258(94.9)	14(5.1)	220(80.9)	52(19.1)
Multifoetal	10(83.3)	2(16.7)	10(83.3)	2(16.7)
Missing	15(93.8)	1(6.3)	12(75.0)	4(25.0)
	Likelihood ratio - 1.987		Likelihood ratio - 0.373	
	df - 2, p value - 0.370		df - 2, p value - 0.830	
Mode of delivery				
Caesarean	64(94.1)	4(5.9)	55(80.9)	13(19.1)
Vaginal	219(94.4)	13(5.6)	187(80.6)	45(19.4)
	Likelihood ratio - 0.008		Chi square - 0.003	
	df - 1, p value - 0.931		df - 1, p value - 0.959	
Gestational age at delivery				
Preterm	22(100.0)	0(0)	17(77.3)	5(22.7)
Term	237(94.8)	13(5.2)	203(81.2)	47(18.8)
Missing	24(85.7)	4(14.3)	22(78.6)	6(21.4)
	Likelihood ratio - 5.470		Chi square - 0.287	
	df - 2, p value - 0.065		df - 2, p value 0.870	

For example, the higher figures reported by Obindo et al in North-central Nigeria[3] and in Pakistan[24] may also be attributed to the possible prevailing crises or war around the period of the study.

Ethnicity was significantly associated with the risk of PPD in this study. The reason for this is unclear. Caution should be taken interpreting this finding. The Hausa ethnic group is predominant in the study setting, and more than half (53.3%) of the study population were Hausa. The numbers of other major ethnic groups were quite small, and there were numerous minority ethnic groups, so further and larger studies are required to explain this finding.

Table 5: Association Between Foetal Characteristics and Depressive Symptoms

Characteristic (n=300)	Depressive symptoms (PPD score ≥13)		Combined distress and depressive symptoms (PPD score ≥10)	
	Frequency (Row %)		Frequency (Row %)	
	No	Yes	No	Yes
Baby's sex				
Female	137(95.8)	6(4.2)	121(84.6)	22(15.4)
Male	145(92.9)	11(7.1)	120(76.9)	36(23.1)
Both (multifetal)	1(100)	0(0)	1(100)	0(0)
	Likelihood ratio - 1.271		Likelihood ratio - 3.282	
	df - 2, p value - 0.530		df - 2, p value - 0.194	
Birthweight				
Low (<2.5kg)	27(90.0)	3(10.0)	25(83.3)	5(16.7)
Normal (2.5 - 4kg)	230(96.2)	9(3.8)	196(82.0)	43(18.0)
High (>4kg)	13(92.9)	1(7.1)	9(64.3)	5(37.7)
Missing	13(76.5)	4(23.5)	12(70.6)	5(29.4)
	Likelihood ratio - 8.674		Likelihood ratio - 3.467	
	df - 3, p value - 0.034		df - 3, p value - 0.325	
NICU admission				
No	243(94.6)	14(5.4)	209(81.3)	48(18.7)
Yes	11(91.7)	1(8.3)	9(75.0)	3(25.0)
Missing	29(93.5)	2(6.5)	24(77.4)	7(22.6)
	Likelihood ratio - 0.198		Chi square - 0.528	
	df - 2, p value - 0.906		df - 2, p value - 0.768	
Baby alive				
No	11(73.3)	4(26.7)	10(66.7)	5(33.3)
Yes	272(95.4)	13(4.6)	232(81.4)	53(18.6)
	Likelihood ratio - 7.546		Likelihood ratio - 1.735	
	df - 1, p value - 0.006		df - 1, p value - 0.188	

Parity was a significant factor associated with the risk of PPD in our study, slightly higher among primipara. Two other Nigerian studies[12,19] also found primiparity to be significantly associated with PPD, which they attributed to inadequate knowledge and preparedness for parenting. There might also be a heightened anticipatory fear about labour and caring for the baby. Some other studies rather found multiparity [26,27] to be associated with PPD which they attributed to the stress of caring for more children. Yet other studies found no association of parity with PPD. [10,28]

Baby's birthweight was significantly associated with the risk of PPD in this study; those with macrosomia or low birth weight were more at risk than those with normal birth weight. Perhaps this may be related to

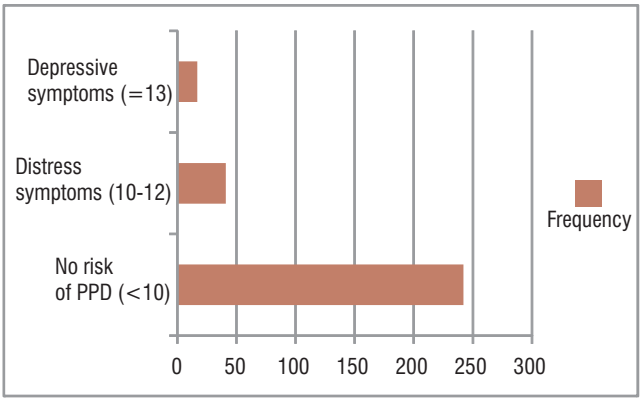
circumstances/co-morbid conditions leading to abnormal birth weight in the first instance, as well as associated increased perinatal morbidity and mortality. Some studies have reported the association of low birth weight with PPD.[29, 30] However, Obindo et al[3] found no significant association between birth weight of the baby and PPD.

Table 6: Association Between Other General Risk Factors and Depressive Symptoms

Characteristic (n=300)	Depressive symptoms (PPD score ≥13) Frequency (Row %) No	Yes	Combined distress and depressive symptoms (PPD score ≥10) Frequency (Row %) No	Yes
Recent stressful event				
No	270(95.4)	13(4.6)	231(81.6)	52(18.4)
Yes	13(76.5)	4(23.5)	11(64.7)	6(35.3)
	Likelihood ratio - 6.581		Likelihood ratio - 2.541	
	df - 1, p value - 0.010		df - 1, p value - 0.111	
History of depression				
No	274(94.5)	16(5.5)	235(81.0)	55(19.0)
Yes	5(83.3)	1(16.7)	4(66.7)	2(33.3)
Missing	4(100.0)	0(0)	3(74.0)	1(25.0)
	Likelihood ratio - 1.397		Likelihood ratio - 0.756	
	df - 2, p value - 0.497		df - 2, p value - 0.685	
Lack of social support				
No	273(94.5)	16(5.5)	235(81.3)	54(18.7)
Yes	5(83.3)	1(16.7)	3(50.0)	3(50.0)
Missing	5(100.0)	0(0)	4(80.0)	1(20.0)
	Likelihood ratio - 1.510		Likelihood ratio - 2.911	
	df - 2, p value - 0.470		df - 2, p value - 0.233	
History of domestic violence				
No	275(94.2)	17(5.8)	237(81.2)	55(18.8)
Yes	1(100.0)	0(0)	1(100.0)	0(0)
Missing	7(100.0)	0(0)	4(57.1)	3(42.9)
	Likelihood ratio - 0.946		Likelihood ratio - 2.494	
	df - 2, p value - 0.623		df - 2, p value - 0.287	
Smoking status				
No	276(94.2)	17(5.8)	238(81.2)	55(18.8)
Yes	1(100.0)	0(0)	0(0)	1(100.0)
Missing	6(100.0)	0(0)	4(66.7)	2(33.3)
	Likelihood ratio - 0.627		Likelihood ratio - 4.000	
	df - 2, p value - 0.661		df - 2, p value - 0.135	
Poor quality relationship with partner				
No	273(94.1)	17(5.9)	234(80.7)	56(19.3)
Yes	10(100.0)	0(0)	8(80.0)	2(20.0)
	Likelihood ratio - 1.187		Likelihood ratio - 0.003	
	df - 1, p value - 0.276		df - 1, p value - 0.957	
History of drug abuse				
No	275(94.2)	17(5.8)	237(81.2)	55(18.2)
Yes	1(100.0)	0(0)	0(0)	1(100.0)
Missing	7(100.0)	0(0)	5(71.4)	2(28.6)
	Likelihood ratio - 0.946		Likelihood ratio - 3.679	
	df - 2, p value - 0.623		df - 2, p value - 0.159	

Perinatal mortality and recent stressful events (such as loss of a family member/relative) were found to be significantly associated with the risk of PPD in this study. This is not surprising, and it was reported in one other study that women were three times more likely to have postpartum depressive symptoms if they experienced a perinatal death than compared to those who had not. [31] This is similar to other reports,[32, 33] and may be explained by the fact that such significant losses lead to recurrent feelings of pervasive sadness and sorrow.[34]

Figure 1: Risk of PPD among Respondents (PPD Scores)



In our study, religion was significant only when the cut-off point was lowered to <10, indicating distress symptoms which may persist and progress to PDD, hence requiring further monitoring. Obindo *et al* [3] reported religious affiliation as being significant to the risk of PPD as probably some people may find it comforting to relieve stress, but Tungchama et al[17] found no such association.

In our study age was not significantly associated with the risk of PPD. This finding is similar to some other studies.[6, 10, 12] Tungchama et al[17] however found age to be significant. Perhaps older women are more experienced and better able to cope with stress associated with pregnancy and delivery depression. [17]

Unlike our study, some other studies found several other factors to be significantly associated with PPD such employment status, [4, 5, 35] educational level, marital status and type of marriage,[17] previous history of mental health problems,[26] unplanned pregnancy,[26] sex of the baby,[5] among others.

Mode of Delivery was not significantly associated with PPD in our study and is similar to other studies.[10] Unlike our study however, Owoeye et al.[4] found mode of delivery to be associated with PPD, it was higher among women who delivered through caesarean section than those who did via the vaginal route.

The use of a validated screening tool is a strength; however, all tools (including screening instruments) have

their own inherent limitations. The EPDS does not adequately evaluate context or exhaust all possible symptoms of PPD.[36, 37] This was a hospital-based study with convenience sampling, and this may have introduced some selection bias. The high level of stigma associated with mental illnesses in our environment [46] may also contribute to some information bias. Missing data may also affect the quality of data.

Conclusions

It is still important to routinely screen for PPD in our environment. Our study found relatively low level risk for PPD. Ethnicity, parity, birthweight, death of the baby and experience of a recent stressful event were significantly associated with this risk.

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Limitations in education, employment and relationship amongst persons with epilepsy: the experiences from Benin City, Nigeria

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Abstract

Background: The persons with epilepsy have higher rates of educational underachievement, unemployment and being unmarried. These socioeconomic consequences of epilepsy can be more difficult to overcome than the seizures. In Nigeria there is a paucity of information on the socioeconomic limitations experienced by persons with epilepsy (PWE). We therefore sought to determine the predictors of these socioeconomic variables amongst PWE in Benin City, Nigeria.
Methods: This was a cross-sectional study, done at the neurology clinics of the University of Benin Teaching Hospital and the Central Hospital, Benin City. Persons on treatment for epilepsy were consecutively recruited. Using a structured questionnaire the demographics, clinical characteristics and socioeconomic experiences with regards to education, employment and relationships were obtained.
Results: One hundred and thirty PWE were recruited. The mean age was 37±10.3 years, range 25 to 55yrs, with 54% being males, while 53.1% have had epilepsy for over 10yrs. About 45% have comorbid conditions, 51% are not adherent to anti-epilepsy drugs, while 49.2% have had stigma experience. Approximately 47% have had more than 10 years of schooling, about 56.2% are employed while 55.4% are in an intimate relationship. Educational underachievement was predicted by stigmatization, while unemployment and not being in a relationship was predicted by stigmatization and longer duration of epilepsy.
Conclusion: The high proportion of the participants with socioeconomic challenges is worrisome. It is hoped that meeting the educational and vocational needs of PWE, in addition to public campaign on epilepsy could reverse the situation.

Keyword. Epilepsy, education, employment, relationship, stigmatization, socio-economics.

Highland Med Res J 2022;22(1):39-43

Introduction

Epilepsy is a common neurologic disease affecting over 50 million persons worldwide, and about 80% of these live in the developing countries, with poor infrastructure and limited health manpower. Epilepsy accounts for approximately 1% of global burden of disease according to WHO, and in brain disorders it is amongst the four most important causes of personal and socioeconomic loss.[1]

There have been advances in the diagnosis and treatment of epilepsy, but these have not abolished the stigmatization, and psycho-socioeconomic burden of this disease especially in the developing counties. The disease is known to create profound limitations in the lives of sufferers in aspects of schooling, occupation and marriage. [2.3]

With a prevalence rate of epilepsy in Nigeria ranging from 5.3 to 37 per 1,000 people, there may be between 1 to 7.5million persons with epilepsy (PWE) in Nigeria.[3] This is staggering in view of the infrastructural deficits and dearth of expertise that is common in many resource poor nations.[2,3]

Epilepsy is characterized clinically by transient or prolonged episodes of recurrent seizures with involuntary movement of any or all parts of the body, sometimes with loss of consciousness. Traditionally clinicians managing individuals with epilepsy may be more concerned with seizure control and minimizing adverse effects of anti-epileptic drugs (AEDs). A person with epilepsy (PWE) is said to have his/her seizure controlled when they are seizure free and there are no or minimal adverse effects from AEDs. These mandates are very fundamental to the care of the PWE, however the PWE may be more worried about the social, psychological and economic issues about epilepsy, including education, employment and marriage. The PWE have been found to have higher rates of educational underachievement, unemployment and been unmarried.[2,4] These concerns of the PWE are said to affect the quality of life of these individuals and are infrequently assessed in course of routine clinic consultations.

The World Health Organization acknowledges that the social consequences of epilepsy are more difficult to overcome than the seizures themselves.[1] These social health issues focuses on employment, accommodation, transportation, relationship, including friendship, family life and marriage.

In Nigeria there are few studies published on the socioeconomic challenges in persons with epilepsy. [4,5] So far, to the best of our knowledge we are not aware of any

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study that has been reported on the experiences of persons with epilepsy, regarding education, employment and intimate relationship in the south-south region of Nigeria. Using a logistic regression analysis, this study aimed to determine the predictors and profile the experiences, impediments, limitations and challenges that influence the socioeconomic life of the PWE, especially in respect to schooling, employment and relationship. The findings should bridge the knowledge-gap and aid the health care worker in assisting the PWE in addressing and coping with their socioeconomic challenges.

Methods

This was an observational cross-sectional study, conducted at the neurology clinics of both the University of Benin Teaching Hospital and the Central Hospital Benin City from March 2019 to September 2021. Persons who were managed for epilepsy and who consented to participate in the study were consecutively recruited in the course of their routine follow up clinics. Ethical approval was obtained from the ethics and research committee Central Hospital Benin City.

The participants were aged 25years and older, since it has been reported in Nigeria, from that age these adults should have completed their secondary schooling, might be employed and may be in a relationship [6] Patients with severe neurological or psychiatric disorder and those with serious comorbid medical conditions which would impair responses or affect the quality of life beyond that caused by epilepsy were excluded.

The study instrument was a structured questionnaire, which was designed based on the review of previous studies on epilepsy with regards to education, employment and marriage. The questionnaire was pilot tested on ten persons with epilepsy and minor changes effected. Responses to the questions were both closed and open-ended. Each participant was interviewed face to face by the authors with the survey instrument. The following variables were determined from the conversation, the age, the gender, the duration of the epilepsy, the religion, the educational status, the income per month of sponsors of schooling, housing, transportation, employment status, relationship status, frequency of seizure attacks, adherence to AEDs,[7] AEDs side effects, experience of unfair treatment (stigmatization), presence of comorbid conditions (confirmed from the medical records). Responses to the open-ended questions were examined, analyzed and thereafter re-grouped/re-classified into categories.

Statistical analysis was done using IBM SPSS version 22 (SPSS Inc., Chicago Illinois). Means, standard deviation, range were used to present continuous variables while frequency and percentages for categorical variables. Logistic regression analysis was used to examine the effects of eight independent variables on each of the three dependent variables, of educational status, employment status and relationship status. The hypothesis testing was two tailed and significance was $P < 0.05$

Results

One hundred and sixty-four persons with epilepsy (PWE) were approached and invited to participate in the study. Fourteen PWE declined participating, twelve were below the age of 25years, while eight were too ill to participate. One hundred and thirty PWE who met the inclusion criteria and consented to participate were recruited. The mean age of the participants was 37±10.3 years with a range of 25 to 55years. Seventy percent of the participants were aged below 40years. Fifty four percent were males, and over half of the participants (53.1%) have had epilepsy for 10 years or more, while about 47% had 10 years or more of schooling which included completed secondary education and tertiary education. Approximately eighty seven percent of the participants had sponsors of their educational pursuit whose estimated monthly income was < 100,000 naira. (Table 1).

About 55% are currently or previously in a relationship, of which 19.2% are married. Regarding employment status, 56.2% are employed. Around 45% of participants had comorbid conditions, including, hypertension, diabetes, migraine, depression and anxiety, while about half (49.2%) of the participants have had the experience of stigmatization. In a period of 6 months, about a third (30.8%) of participant experience only one incident of seizure or none at all with about 51% of the participants not adherent to their AEDs and 56.2% had experienced side effects of AEDs (Table 1).

In the logistic regression analysis the male gender (P= 0.002), those with fewer seizure attack (P= 0.035), those with AEDs adherence (P= 0.025) were more likely to have attained a higher educational status, while those with the experience of stigmatization (P = 0.0001) were likely to have attained a lower educational status (Table 2).

Regarding employment status, the participants with higher educational qualification (P= 0.001)), those with adherence to AEDs (P= 0.02), and those with no observed side effects of AEDs (P= 0.02), are more likely to be employed, while the males (P= 0.02), those with the experience of stigmatization (P = 0.002), and those with longer duration of their epilepsy (P= 0.001) are more likely to be unemployed (Table 2).

Those more likely to achieve an intimate relationship were males (P=0.021), those with higher education status (P= 0.001), those adherent to AEDs (P=

0.007), and those with no observed side effects of AEDs (P= 0.034). While those with stigmatization experiences (P= 0.01) and a longer duration of epilepsy (P= 0.02) were less likely to achieve a relationship (Table 2).

Table 1. Demographics and clinical characteristics of participants (130 persons with epilepsy)

Variable	n%
Age categories	
< 40years	91 (70%)
≥ 40years	39 (30%)
Gender	
Female	60 (46.2%)
Male	70 (53.8%)
Educational status(duration)	
Primary up to junior secondary< 10yrs	69 (53.1%)
Senior sec to tertiary ≥ 10yrs	61 (46.9%)
Income/ month of education sponsor	
< 100,000 naira	113 (86.9%)
≥ 100, 000 naira	17 (13.1%)
Intimate relationship	72 (55.4%)
Married	25 (19.2%)
Separated	11 (8.5%)
Divorced	9 (6.9%)
Engaged but not married	13 (10%)
Co-habiting	10 (7.7%)
Widow/Widower	4 (3.1%)
Never in a relationship	58 (44.6%)
Employment status	
Unemployed	57 (43.8%)
Employed	73 (56.2%)
Co-morbidity	
Present	58 (44.6%)
Absent	72 (55.4%)
Experience stigmatization	
No	66 (50.8%)
Yes	64 (49.2%)
Average number of seizures in 6 months	
≥ 3 seizures	38 (29.2%)
2 seizures	52 (40.0%)
≤ 1 seizure	40 (30.8%)
Adherence to AEDs	
Non adherent	66 (50.8%)
Adherent	64 (49.2%)
Side effects of AEDs	
Yes	73 (56.2%)
No	57 (43.8%)
Duration of epilepsy	
< 10years	61 (46.9%)
≥ 10years	69 (53.1%)

Discussion

We found that the males with epilepsy were more likely to attain higher educational status. This may reflect the cultural practices where the male child is preferentially cared for than the female.[8] There have been divergent views regarding the association between gender and schooling.[9,10]

This study also revealed that males are more likely to be unemployed and more likely to be in a relationship. It might be a furtherance of the same cultural practices where the male individual is provided for and suitors are arranged for them.[8] In contrast the difficulty experienced in establishing an intimate relationship by the females with epilepsy is well known.[5,9,11] It is hoped that these cultural practice be changed.

Over half of PWE had the junior secondary education as their highest educational attainment, which means majority of PWE may not be sufficiently educated to face the demands of living with a chronic condition as in epilepsy. There is agreement from other studies indicating poor educational attainments amongst PWE, with less than 50% achieving higher education.[4,9,10] This educational underachievement observed in PWE could be due to recurrent seizure attacks, post seizure confusion, AEDs somnolence, cognitive slowing, absenteeism, frequent hospital admission and stigmatization.

The majority of the sponsors (87%) of participants' education had limited funds, which is in keeping with other studies that found epilepsy commoner amongst the socio-economically disadvantaged groups.[1-4] The low socioeconomic class are burdened with important conditions that may increase the risk for developing epilepsy. PWE should be supported by the communities and government in the funding of their education.

A significant proportion of PWE (53%) have had epilepsy for a long time and were less likely to be employed and to have a relationship. Early age of onset or a longer duration of epilepsy have been observed to affect the quality of life of PWE. [12]

Fewer seizure attacks in our participants was associated with higher educational status. This has also been observed in other studies.[13] Fewer attacks leads to focused educational pursuit, fulfilment in work and relationships.

Comorbid conditions were noted in the medical records of 45% of our participants. Comorbid conditions have been observed in other studies with up to sixty percent of PWE having depression and over forty percent with anxiety symptoms, and these are known to affect the quality of life of the PWE.[2.4.14] These comorbid conditions should be identified and managed.

Table 2. Logistic regression analysis of predictors of dependent variables

Variables	Education (duration ≥ 10yrs, OR 95% CI)	P value	Employment Status (employed OR 95%CI)	P value	Intimate relationship* OR 95% CI)	P value
Age						
< 40years	1	0.60	1	0.12	1	0.10
≥ 40years	0.63 (0.11 to 3.5)		0.19 (0.024 to 1.5)		0.18 (0.022 to 1.3)	
Gender						
Female	1	0.002	1	0.02	1	0.021
Male	7.9 (2.13 to 29.5)		0.16 (0.03 to 0.7)		5.44 (1.29 to 22.8)	
Education (duration)						
< 10yrs	-	-	1	0.001	1	0.001
≥ 10yrs	-	-	14.0 (3.73 to 52.7)		13.0 (3.84 to 44.2)	
Sponsor of education (income)						
≥ 100,000 naira	1	0.13	-	-	-	-
< 100,000 naira	4.18 (0.65 to 27.6)		-	-	-	-
Co-morbidity						
Present	1	0.44	1	0.09	1	0.094
Absent	1.84 (0.39 to 8.7)		0.27 (0.06 to 1.2)		0.29 (0.07 to 1.2)	
Experience of stigmatization						
No	1	0.0001	1	0.002	1	0.011
Yes	0.05 (0.01 to 0.2)		0.05 (0.01 to 0.3)		0.11 (0.02 to 0.6)	
On average Number of seizure in 6mths						
≥ 3seizures	1		1		1	
2 seizures	4.74()1.36 to 16.5)	0.015	0.82 (0.22 to 3.1)	0.77	0.10 (0.28 to 3.5)	0.10
≤ 1 seizure	6.29 (1.14 to 34.6)	0.035	0.37 (0.05 to 2.6)	0.32	0.35 (0.06 to 2.1)	0.25
Adherence to AEDs						
Non adherence	1	0.025	1	0.02	1	0.007
Adherence	4.58 (1.23 to 17.2)		10.8 (2.47 to 46.8)		6.50 (1.65 to 25.5)	
Side effects of AEDs						
Yes	1	0.87	1	0.021	1	0.034
No	0.89 (0.21 to 3.7))		7.94 (1.37 to 46.0)		5.95 (1.14 to 31.0)	
Duration of epilepsy						
< 10years	1	0.10	1	0.001	1	0.02
≥ 10years	0.19 (0.03 to 1.3)		0.01 (0.001 to 0.1)		0.03 (0.003 to 0.2)	

The reference variables were age < 40years, female gender, education duration < 10yrs, monthly income of education sponsor ≥ 100.000 naira, comorbid condition present, no stigmatization, seizure attacks in 6mths ≥3seizures, non-adherence to AEDs. AEDs side effects present, duration of epilepsy < 10years.

*Intimate relationship was defined as any relationship that have resulted in marriage (currently or previously: married, separated, divorced, widow, widower) or may result in marriage according to the opinion of the participant (engaged, co-habiting)

AEDs = anti-epileptic drugs, CI= confidence interval, OR = odds ratio

It was revealed in this study, that about 45% of PWE have never in their life time had any intimate relationship which might lead to marriage. Difficulty in having a friendship is well established amongst PWE and this sorry state is even more in women.[5,11] With a high proportion of PWE not in a relationship, the main reasons adduced was not being gainfully employed and no suitor coming around. Additionally in some communities, persons are not comfortable with their relations having intimate relations with PWE.

We observed that those who experienced stigmatization were less likely to attain higher educational status, be employed and achieve an intimate relationship. This has been variously reported.[2,10,11,13] For many PWE, stigmatization is even more debilitating than the seizure itself. Public campaign on epilepsy could reverse this situation.

Only 49% of our respondents were adherent to their ant-epilepsy drugs, which is similar to other report.[15,16] Those with AEDs adherence were likely to have higher educational attainment, been employed and having a relationship. Poor AEDs adherence would cause more frequent attacks, with negative socioeconomic implications.

About 44% of our respondents had no side effects of AEDs and they were more likely employed and in a relationship. These side effects may include minor to sever complaints and have been reported to affect the quality of life of PWE.[16,17] AEDs side effects should be identified and managed accordingly.

A considerable proportion of PWE have never been employed. The high proportion of the unemployed could be a reflection of the level of unemployment in the communities where PWE live, with an unemployment rate in Nigeria at 33% in 2022.[18] Some studies have observed lesser rates of unemployment, some about the same as ours, while others slightly higher figures.[5,10,17,19] Stigmatization, recurrent seizures, educational underachievement, limited social skills, AEDs side effects have all been associated with unemployment and underemployment.

The limitations of the study included the fact of it being a hospital based study with a modest number of participants. Some of the variables were determined by review of medical records. In determining some variables no instruments was utilized for measurements.

Conclusions

A high proportion of the participants were poorly educated, unemployed and not in a relationship, while stigmatization, and prolonged duration of seizure were amongst the significant predictors of these variables. It is hoped that meeting the educational and vocational needs of PWE, in addition to public campaign on epilepsy could reverse the situation.

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Ophthalmic manifestations of leukemia and their association with hematologic parameters among adult patients in Jos, Nigeria

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Abstract

Objective: To determine the prevalence and pattern of ophthalmopathy in patients with leukemia, and their relationship with hematological parameters.

Patients and Methods: A cross sectional study of consecutive adult patients diagnosed with any leukemia, confirmed by bone marrow biopsy in two referral hospitals in Jos. Data was collected between January 2016 and June 2017. Socio-demographic and medical history were obtained from patients who consented to participate in the study. Results of the most recent hematologic parameters were retrieved from patient's case notes. Comprehensive ocular examination, including dilated fundoscopy was conducted and findings noted. Data was analysed using Statistical Package for Social Sciences version 21.

Results: Sixty-nine patients were examined during the study period. Their mean age was 44±18.8 years with a male to female ratio of 1.9:1. Forty-four (63.8%) participants had ocular manifestations. Leukemia specific manifestations were largely in the posterior segment (50.8%) and include tortuous retinal vessels (11.9%), retinal hemorrhage (10.2%), maculopathy (8.5%), disc swelling (5.9%) and cotton wool spots (5.1%). Non-leukemia specific manifestations such as cataract, pseudophakia and glaucoma accounted for 33.3% of findings. Significant predictors for occurrence of ocular manifestations were hemoglobin concentration (P=0.042) and platelet count (P=0.006). Increasing hemoglobin concentration may reduce the likelihood of developing retinal hemorrhage in 43.5% of cases (p= 0.007).

Conclusions: Ocular manifestations of leukemia were predominantly in the posterior segment and frequently associated with anaemia and thrombocytopenia.

Key-words: Leukemia, ophthalmic-manifestations, haematological-parameters, Jos

Highland Med Res J 2022;22(1):44-50

Introduction

Leukemia is a malignant clonal disorder of bone marrow stem cells that are responsible for producing white blood cells. It is considered a potentially blinding condition due to ocular complications that may be associated with it.

Leukemia comprises a group of malignancies arising from circulating white blood cells characterized by peripheral leucocytosis. The circulating leucocytes are either immature and or dysfunctional. Abnormalities may affect either the lymphopoietic or myelopoietic arms of hematopoiesis, resulting in lymphoid and myeloid leukemia respectively.[2,3] Leukemia can thus be classified into myeloid or lymphoid, acute or chronic based on the origin of the precursor cell and clinical course respectively.[1-3] This categorization accounts for the four broad classes of leukemia; acute myeloblastic leukemia (AML), chronic myelogenous leukemia (CML), acute lymphoblastic leukemia (ALL) and chronic lymphocytic leukemia (CLL).

Ocular involvement in leukemia has long been documented and can affect nearly all ocular tissue with several published reports from developed countries but only a few from Subsaharan-Africa.[4-10] Ocular disorders of leukemia, symptomatic or asymptomatic may result from direct ocular infiltration by leukemic cells or indirect ocular involvement resulting from secondary hematologic changes or as complications of various treatment modalities such as chemotherapy, total body irradiation, or bone marrow transplantation.[2,3]

Previously published data on leukemia from Jos suggests that, it is the most frequently observed hematologic malignancy, but local data on ocular involvement is limited.[11-14] This study presents data on the frequency and pattern of ocular manifestation in adult patients with leukemia in Jos Nigeria and their relationship with hematologic indices.

Patients and Methods

A descriptive, hospital-based study of adult (≥ 18yrs) patients with Acute myeloblastic leukemia (AML), Acute lymphoblastic leukemia (ALL), Chronic myelogenous leukemia (CML) and Chronic lymphocytic leukemia (CLL) irrespective of treatment status, being managed at the hematology and blood transfusion units of two major referral tertiary hospitals in Jos, between January 2016 and June 2017 (18months) was conducted.

The diagnosis of leukemia was made by examination of peripheral blood and bone marrow studies. All eligible patients who consented, were

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consecutively recruited into the study. Patients who were unwilling to have a complete eye examination including dilated ophthalmoscopy or moribund patients who were unable to have full ocular examination were excluded. Ethical approval was obtained from the Ethical review committees of the two hospitals. At all times, the tenets of the Declaration of Helsinki for research involving human patients were upheld.

Patients were interviewed to obtain socio-demographic data, medical and ophthalmic history. Results of hemoglobin concentration (Hb), Total leucocyte count (TLC) and platelet count (PLC) routinely conducted for all patients on admission and a day prior to clinic visit for follow up patients were retrieved from their case notes. Clinical examination included that of the ocular adnexa with pen torch, slit-lamp examination of the anterior segment as well as dilated fundoscopy. Intraocular pressure was measured with a Goldman Applanation Tonometer after instilling 2 drops of Tetracaine and pre-staining with 2% fluorescein strips. The tonometer head was sterilized with 3.75% sodium hypochlorite solution and cleaned with normal saline after every use. Mydriatic fundus photographs were taken for patients with significant fundal pathology using a Canon CR-2 digital retinal camera (Canon Inc., Medical Equipment Group, 30–2, Shimomaruko 3-chrome, Ohta-ku, Tokyo, Japan.

Ocular abnormalities were classified as follows[8]**:**

a. Primary ocular complication: Likely to result from leukemic infiltrate and include proptosis, iris heterochromia, retinal leukemic infiltrates, and Roth spots.
b. Secondary ocular complications: Likely to result from hematological alterations such as anaemia, thrombocytopenia, hyper-viscosity or immune deficiency and systemic therapy. These include retinal haemorrhages (RH), vascular abnormality, disc swelling, cotton wool spots, vitreous haemorrhage and exudative retinal detachment.
c. Miscellaneous ocular abnormalities- Eye diseases unlikely to be related to leukemia such as pterygium, cataract, pseudophakia and glaucoma.

Data management

Data collected was entered into Statistical Package for Social Sciences version 21 and analysed. Frequency distribution tables were generated for all data collected. Fisher's exact test was used to test association between some categorical variables. Each hematologic parameter was assessed separately in relation to occurrence of ocular manifestation in a simple logistic regression model. Multivariable logistic regression model was then used to assess the independent effect of hematologic parameters that showed significance in the simple regression model with specific ocular manifestations. The results are presented in the form of tables. A P Value of < 0.05 was regarded as statistically significant for each variable of interest.

Results

A total of 138 eyes of 69 adult patients were examined for ocular changes during the study period. There were more males with a male to female ratio of 1.9:1. The mean age in this study was 44±18.8 with a range of 18 – 83 years. There was no statistically significant difference in age-gender distribution of the study group (Fisher's Exact P=0.26) as shown on Table 1.

Majority of the patients had chronic and myeloid forms of leukemia; 75.4% (52/69) and 63.8% (44/69) respectively. Chronic myeloid leukemia (CML) was the most common type of leukemia 47.8% (33/69) while acute lymphoblastic leukemia (ALL) was the least common 8.7% (6/69) as seen on table 2. Forty-four (63.8%) of the patients had ocular manifestations. Most participants with eye changes had CML followed by those with CLL and the least being those with ALL. The occurrence of ocular manifestation by leukemia subtype was not found to be statistically significant (Fisher's Exact P=0.24) as shown on table 2.

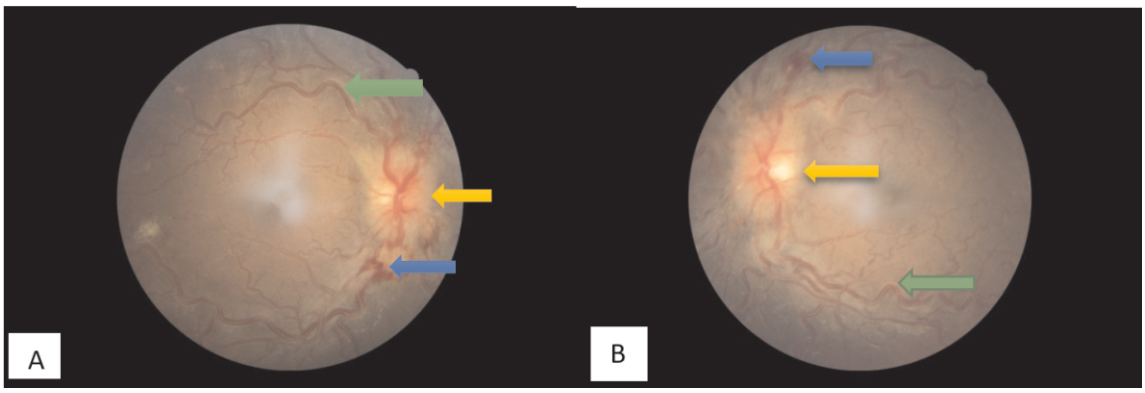

Figure 1: Fundal photograph A (Right eye) and B (Left eye) showing tortuous retinal vessels (green arrow), disc swelling (yellow arrow) and retinal hemorrhage (blue arrow) in a 28 years old female with CML

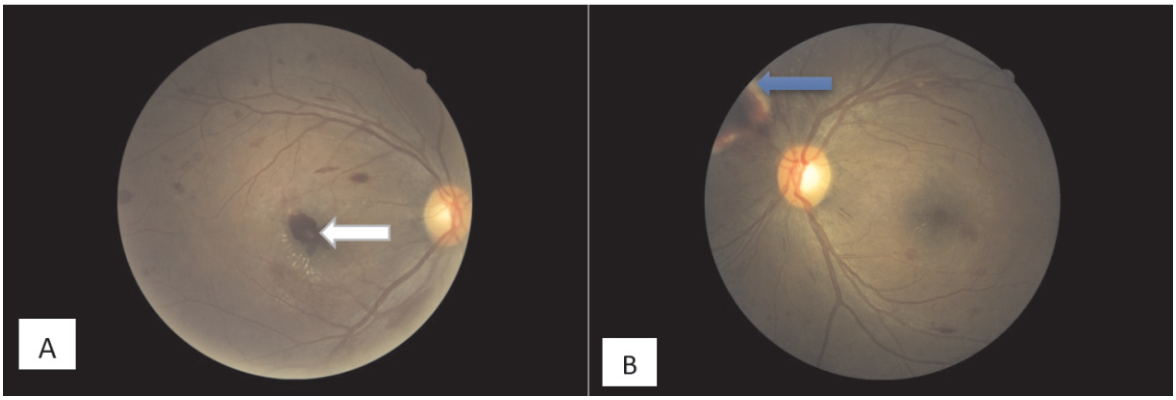

Figure 2: Fundal photograph A (Right eye) and B (Left eye) of a 33 years old male with AML, showing retinal (Blue arrow), macular hemorrhage and macular edema (White arrow).

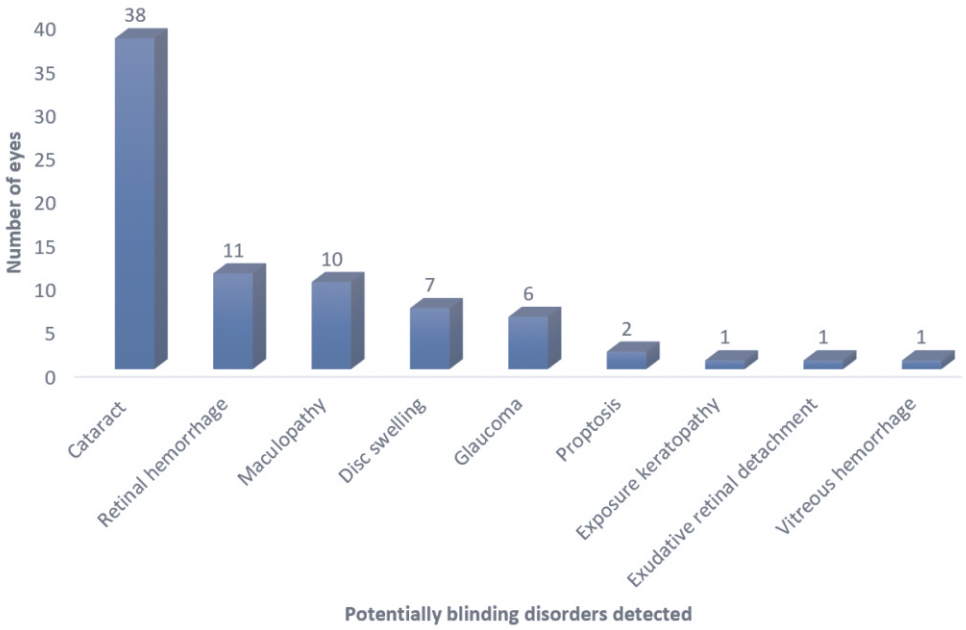

Figure 3: Potentially blinding disorders (by eyes) detected among adult leukemia patients in Jos

A total of 177 ocular manifestations were detected in eyes of 44 participants, 66.7 % (118/177) were leukemia specific while 33.3% (59/177) were miscellaneous. Of the disease specific disorders, the posterior segment had the most ocular findings 50.8% (60/118) followed closely by the ocular adnexa 46.6% (55/118) and the least being the anterior segment 2.5% (3/118). Tortuous retinal vessels 11.9% (14/118), retinal hemorrhage 9.3% (11/118), maculopathy 8.5% (10/118), disc swelling 5.9% (7/118) and cotton wool spots 5.1% (6/118) were the predominant findings of the posterior segment as illustrated in Figures 1 and 2. Cataract was the most frequent anterior segment pathology while pallor, conjunctival cock screw vessels and peri-orbital edema were the most common adnexa findings. One hundred (84.7%) of the leukemia specific ocular manifestations were due to secondary hematological alterations. Seventy-seven (43.5 %) of the all ocular changes detected were potentially blinding. They ranged from proptosis in the orbit to cataract and exposure keratopathy in the anterior segment. Posterior segment blinding conditions noted were glaucoma, disc swelling, RH, maculopathy, vitreous hemorrhage and exudative retinal detachment as illustrated in figure 3. Cataract, pseudophakia and glaucoma were non-leukemic findings observed among some participants (See table 3). The distribution of leukemia specific and non-specific ocular disorders by leukemia subtype was statistically insignificant.

The mean Hb of the study population was 9.11± 2.59g/dl. The distribution of PLC and TLC were skewed and so presented as median and interquartile ranges as shown on table 4. Simple logistic regression of presence of ocular manifestations with hematologic parameters revealed that Hb and PLC were the only hematologic

predictors for the occurrence of ocular manifestations among the study population. Increasing Hb decreases the odds of having ocular manifestation by 19.1% (P=0.04) and by 0.4% (P=0.006) for increasing PLC as depicted on table 5.

Table 1: Age-sex distribution of adult leukemia patients in Jos between January 2016 and June 2017

Age group (years)	Sex		
	Male N (%)	Female N (%)	Total N (%)
≤ 20	3 (6.7)	3 (12.5)	6 (8.7)
21-30	9 (20.0)	8 (33.3)	17 (24.6)
31-40	10 (22.2)	1 (4.2)	11 (15.9)
41-50	4 (8.9)	1 (4.2)	5 (7.2)
51-60	9 (20.0)	3 (12.5)	12 (17.4)
61-70	6 (13.3)	7 (29.2)	13 (18,8)
>70	4 (8.9)	1 (4.2)	5 (7.2)
Total	45 (100)	24 (100)	69 (100)

Table 2: Prevalence of ocular manifestation by leukemia type among patients in Jos between January 2016 and June 2017

Type of Leukemia	Ocular manifestation present		
	Present N (%)	Absent N (%)	Total N (%)
ALL	4(9.1)	2(8.0)	6(8.7)
AML	8(18.2)	3(12.0)	11(15.9)
CLL	15(34.1)	4(16.0)	19(27.5)
CML	17(38.6)	16(64.0)	33(47.8)
Total	44(100.0)	25(100.0)	69(100.0)

ALL- Acute lymphoblastic leukemia, AML-Acute myeloblastic leukemia, CLL-Chronic lymphocytic leukemia, CML- Chronic myeloid leukemia.

Fitting significant ocular manifestations into multiple logistic regression model shows that Hb is the only significant predictor of the presence of RH after controlling for PLC, type of leukemia and age of patient. With increasing Hb, the odds of RH occurring decreases by 43.5% (P=0.007) as shown on table 5.

Discussion

Knowledge of the ocular manifestations of leukemia is important because the eye has been reported as a frequent extra-medullary location for leukemic cells, and the only site where leukemic involvement of nerves and blood vessels can be directly observed.[8] Ocular involvement in leukemia may result from either direct infiltration of ocular tissues by leukemic cells (primary involvement) or secondary to hematologic alterations or ocular side effects of treatment.[4,] Leukemic ophthalmopathy may present prior to diagnosis of the systemic disease or may manifest during the course of treatment and follow up.[4,] Advances in diagnosis and treatment of leukemia have considerably improved the survival of patients, leading to an increase in the various ways leukemia can present in the eye.[5,8] Although all age groups can be affected, most cases of leukemia occur in adults.

The prevalence of ocular manifestations of 63.8% in our cohort is comparable to 69.2% reported by Jakkal[15] in India, 77.8% reported by Eze[10] and 70.0% documented by Ilo[16] in south-east and south-west Nigeria respectively. This differs moderately from reports of 43.8% and 52.2% by some authors from India[6,17] but contrasts markedly to 14.9% given by Omoti[9] in south-south Nigeria, 35.4% by Reddy[18] et al in Malaysia and 39.0% by Schachat[19] in United states of America. This divergent variation in prevalence of leukemic ophthalmopathy may be a reflection of the transient nature of ocular findings in leukemia which wax and wane with treatment.[8] The observed disparity may also be due to differences in case mix. Review of the above publications revealed that ocular manifestations were higher in studies that had more adults with chronic and myeloid leukemia's compared to those that had children in whom the leukemia is mainly acute, lymphoid and is more rapidly fatal.[6,10,15-19] Furthermore, although the role of therapy in the pathophysiology of some ocular changes in leukemia has been reported, it remains unclear if this wide variation in the frequency of ocular changes is related to the proportion of patients on therapy or their exclusion in some study designs.[8] A prospective research specifically designed to determine the effect of treatment on the course of ocular changes in leukemia would be appropriate before definitive conclusion can be drawn.

Chronic leukemia is the most common leukemia subtype among our study population. This is similar to previous reports from Nigeria[9,10,16] The high prevalence of ocular manifestations in CML compared with other subtypes in our cohort although not statistically significant is consistent with reports from other authors in Nigeria, Malaysia and India. [9,10,17-19,20] Possibly due to the low frequency of the acute leukemia's among adults while the rarer occurrence of ocular changes in CLL has been attributed to its indolent course when compared to CML.[18,21]

The pattern of ocular involvement in leukemia varies across different studies, probably due to the transient nature of the disease or its complications.[4,8,21] In our study, most of the leukemic ophthalmopathy detected were in the posterior segment and were largely from secondary causes. A similar distribution of posterior segment disorders has been described in some surveys.[10,16,22,] Potentially blinding conditions identified among our study subjects include vitreous hemorrhage, exudative retinal detachment, RH, disc swelling, maculopathy, glaucoma, proptosis and cataract. These

conditions are treatable but require early detection and, in some instances, prompt intervention to prevent blindness. Some ocular findings in our patients such as pterygium, cataract, pseudophakia and glaucoma were thought to be miscellaneous as their direct association with the disease have not been established. A variety of similar miscellaneous ocular findings were found among leukemia patients in Nigeria and the United States of America.[9,10,19] The detection of these miscellaneous disorders among our cohort highlights the importance of comprehensive ocular assessment of patients with leukemia.

Table 3: Pattern of ocular affectation in 44 leukemia patients with ophthalmopathy by anatomical location

	Ocular adnexa/orbit	N	Anterior segment	N	Posterior segment	N	
Primary changes	*Proptosis	2	Iris heterochromia	2	*Disc swelling	7	
	-	-	-	-	Retinal infiltrate	3	
	-	-	-	-	Perivascular sheathing	2	
	-	-	-	-	Roth spots	2	
Secondary changes	Pallor	32	*Exposure-	1	Tortous retinal vessels	15	
	CCSV	8	keratopathy		*Retinal hemorrhage	11	
	Periorbital oedema	6			*Maculopathy	10	
	Chemosis	2			Cotton wool spots	6	
					*Disc Hemorrhage	2	
	Conjunctiva injection	2	-	-	*Vitreous hemorrhage	1	
	Jaundice	2	-	-	Exudative retinal detachment	1	
	Subconjunctiva haemorrhage	1	-	-			
			-	-	-	-	
Miscellaneous changes	Pingueculum	7	*Cataract	38	*Glaucoma	6	
	Pterygium	3	Pseudophakia	4	Asteriod hyalosis	1	
Total		65		45		67	177

*NB: Some patients had two or more findings in two or more segments of one or both eyes. N- Frequency, CCSV-Conjunctival cock screw vessels, * potentially blinding*

Table 4: Hematologic profile of adult leukemia patients in Jos between January 2016 and June 2017

Hematologic parameter	Mean N= 69	Standard deviation	Minimum	Maximum
HB (g/dl)	9.11	2.59	3.00	15.00
PLC ($x10^9$/L)	1500.00*	+	20.00	1543.00
TLC ($x\ 10^9$/L)	460.00*	+	1.00	1454.00

*HB- Hemoglobin concentration, PLC- Platelet Count, TLC- Total Leucocyte Count, *median, +not applicable*

In this study, presence of any ocular manifestation was significantly associated with anemia and thrombocytopenia. But Hb is the only significant predictor of the occurrence of RH. A similar association between RH, Roth spots and anemia was documented by Dhasmana[2] and his coworkers. Savyasonman[21] and colleagues in their study, reported that increasing Hb, reduced the likelihood of developing subhyaloid hemorrhage in patients with acute leukemia. On the contrary, Reddy[23] in his study of retinopathy amongst patients with acute leukaemia noted that there was no significant association between anemia with RH and Roth spots. Furthermore, some researchers from America and Malaysia reported that thrombocytopenia is significantly associated with leukemic retinopathy among patients with acute leukemia.[23] In this study, the odds for RH occurring reduced by 43.5% with increasing Hb. A similar study from India on the other hand, reported that the probability of developing subhyaloid hemorrhage decreased by more than 50% with increasing PLC.[21] There was no significant association between TLC of patients and the presence or absence of ocular manifestation in our study population. This tallies with findings from previous studies and corroborates the fact that although leukemia is primarily a white blood cell disorder, secondary hematological changes are responsible for most of the ocular changes.[21-24] Therefore, the presence of RH in the absence of any established

Table 5: Logistic regression identify factors predicting the occurrence of ocular manifestations and retinal hemorrhage among leukemia patients in Jos between January 2016 and June 2017

Hematologic Parameter	Odds ratio (95% Confidence interval)	
	Ocular manifestation	Retinal hemorrhage
Hemoglobin concentration (g/dl)	0.809 (0.659 - 0.993)**	0.565 (0.374 - 0.853)**
Platelet count (x10^9/L)	0.996 (0.994 - 0.9999)**	0.999 (0.996 -1.002)
Total leucocyte count (x10^9/L)	1.0033 (0.999 - 1.007)	+
CML	+	1.000
ALL	+	1.027 (0.73 - 14.501)
AML	+	1.325 (0.162 - 10.853)
CLL	+	0.787 (0.085 - 7.310)
Age (years)	+	0.992 (0.944 -1.042)

*CML- Chronic Myeloid Leukemia, ALL- Acute Lymphocytic Leukemia, AML- acute Myeloid Leukemia, CLL- Chronic Myeloid Leukemia, *reference subgroup, ** P value <0.05, +variable not fitted into the model*

etiology in patients presenting to the ophthalmologist, should raise a high index of suspicion for leukemia, warranting a prompt hemato-oncologist evaluation and consultation.

Conclusion

Leukemic ophthalmopathy in adult patients is relatively common in our practice. Majority of the ocular changes are seen in the posterior segment of the eye. The predictors of the occurrence of ocular manifestations are Hb and PLC. Therefore, all adult leukemia patients, particularly those with anemia and thrombocytopenia should be referred early for ophthalmic evaluation to ensure early diagnosis and prompt treatment of any sight threatening condition.

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Maternal satisfaction with Intrapartum care at the Jos University Teaching Hospital

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Abstract

Background: A woman's satisfaction with the delivery service may have immediate and long term effects on her health and subsequent utilization of the services. Maternal satisfaction is an essential indicator of the quality and efficiency of health care systems. Providing skilled and satisfying care during pregnancy, intrapartum and postpartum period saves lives of both mother and neonates and so increases service utilization. Women play a principal role in the upbringing of children and the management of family affairs, and their loss from pregnancy related causes is a significant social and personal tragedy. Hence we sought to assess maternal satisfaction with the delivery service in Jos University Teaching Hospital and to determine satisfaction in relation to three dimensions; interpersonal care, information and involvement in decision making and physical birth environment

Methods: A cross sectional study of postnatal women that attended the family health clinic between January to March 2015. A simple random sampling was used on eligible participants. An interviewer administered questionnaire that included respondents sociodemographic characteristics and validated 14 items maternal satisfaction with intrapartum care scale was used. Data was analysed using SPSS version 23.

Results: A total of 173 mothers were interviewed, of which 64.6% of the respondents were between the ages of 20-34 years. All the respondents were married and had a mean age of 27.3±3.2 years. Greater than half of the participants (50.9%) had secondary level of education, 67.1% were multiparous while 32.9% were primiparous. Overall maternal satisfaction level with the delivery services rendered at the hospital was 86.7%.

Conclusion: Although the majority of the participants were satisfied with the services given to them during delivery, lack of satisfaction by the minority group will limit their ability to engage in health facility delivery which will further contribute to maternal mortality. Thus, mechanisms should be devised to increase maternal satisfaction in this health institution.

Keywords: Maternal satisfaction, Intrapartum care, Labour, Nigeria

Date received: 06 May 2022; accepted: 22 July 2022

Highland Med Res J 2022;22(1):51-55

Introduction

The transition to motherhood is a life event that imposes a dramatic change in a woman's life situation. Physical and social adjustments as well as the development of maternal identity are involved in this process. The woman is exposed to new challenges , and this period of pregnancy, labour and delivery entails much uncertainty, which motivates her to seek help and information. This help and care received during childbirth may have a long term effects on the woman, the baby and the family.[1] In recent times determining the level of patient satisfaction has been found to be the most useful tool for getting patients views on how to provide care. This is based on two major principles: patients are the best source of information on quality of health services provided and patient views are the determining factors in planning and evaluating satisfaction.[2] Patient satisfaction is crucial for maintaining and monitoring the quality of health care and can inform service development and delivery.[2,3] Maternal satisfaction is determined by the physical environment of the health service, and the availability and accessibility of medicines and supplies. It is also affected by interpersonal communication with the health care provider, competency of the health care provider and support, and the health status of the mother and new born.[4] The World Health Organization (WHO) emphasizes ensuring patient satisfaction as a means of secondary prevention of maternal mortality, since satisfied women are more likely to adhere to health providers' recommendations and utilization.[5,6] Women's experiences with health care providers and facilities influence their care seeking decisions.[7]

The aim of this study was to determine maternal satisfaction with intrapartum care and determine care in relation to interpersonal care, information and decision making and physical and birth environment.

Materials and Methods

Study Design and Study setting

A cross sectional design was used to recruit participants at the Family Health Clinic of Jos University Teaching Hospital, Plateau State, Nigeria between January to March 2015. The Clinic provides outpatient immunization to newborn and women that delivered both within and outside the Hospital and also serves as referral center from private, cottage, general and specialist Hospitals in Plateau State and neighboring states.

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Labour ward

There are 12 delivery beds in the labour ward and a medical health records office attached to the labour ward. Admissions into labour ward are from referred, booked and unbooked cases. For patients who booked in JUTH, their antenatal cards are retrieved from the medical records department and all the details on the card are reviewed to give insight in further management. A detailed history is taken to ascertain the time of onset of labour; whether membranes have ruptured or not and whether or not there is vaginal bleeding. Physical examination is done and necessary investigations are requested. Spouses are allowed to support their wives during labour, deliveries are taken by doctors and midwives.

The labour ward is equipped with resuscitation facilities for resuscitating the newborn. All vaginal deliveries including operative vaginal deliveries like forceps and ventouse, not requiring general anaesthesia are carried out in the labour room.

Study Population

Postnatal women who attended the clinic for childhood immunization and follow up during the study period and who were eligible were included in the study.

Inclusion criteria included women who are within 6weeks postpartum, given birth to a live baby and delivered within the hospital. However, women who had home delivery, intrauterine foetal death or delivered outside the teaching Hospital were excluded from the study.

Sample size and sampling procedure

Sample size was determined using single population proportion formula using the power of 80% and significance level α at 0.05 with 95% confidence interval.

A non-response rate of 20% was added. Maternal satisfaction with intrapartum care of 90% from a study done in Sweden was used.[8] The final sample size was 166. But 173 participants were recruited to increase the power of the study.

Simple random sampling was used to recruit study participants. All postnatal women who registered their children were identified at the registration counter in the family health unit. Once identified, the researcher approached the respondents individually and screened for eligibility to ensure the respondents fulfill the inclusion and exclusion criteria. A list of eligible respondents was then created and from this eligible list, every third respondents in the list was included in the study. The list was continued every day until enough respondents were recruited.

Data collection tools

An interviewer-administered questionnaire that consists of 2 sections was used. The first section contained the socio-demographic characteristics. Whereas, the second section was a 14-items of Maternal Satisfaction with Hospital-based Intrapartum Care Scale that was sub-scaled into three domains, measuring maternal satisfaction with intrapartum care. This scale was developed and validated from Jordan study and had been used previously in several studies.[9] It has high Cronbach's alpha coefficient of 0.88 and the reliability coefficients for each domain ranged from 0.76 to 0.90. It was a five points Likert scale questionnaire from one, which was strongly disagree to five, which was strongly agree. The first domain measured women's satisfaction with five items related to interpersonal care (IPC) by the health care providers. They were asked if the staff were friendly and welcoming, if doctors and midwives were encouraging and reassuring, if midwives were very helpful, if doctors were very helpful and finally if the overall care was good. The second domain was related to information and decision making (IDM) process (four items). The questions included: Do midwives and doctors kept me informed, decisions were made without taking my wishes into account, felt pressured to have the baby quickly, felt labour was taken over by machines. The third domain was related to physical birth environment (PBE) (five items). The questions in this domain included: was the level of light adequate, was room spacious and adequate, was the level of noise appropriate, were trays and equipment clean and were supplies needed adequate?

A pretest study was then conducted on 17 postnatal women (10% of the sample size calculated) from the target population. The pretest was done before the data collection period of the main study and was done at the postnatal clinic. This was to assess the feasibility of the study design and to assess the face validity of the study instrument based on the clarity, simplicity and readability to complete the instrument. The respondents for pretest study were labelled to ensure that they would not be included in the main study. From the pretest study, it showed that the instrument was generally easy to administer and understand. Respondents required on average of 10 minutes to complete it.

Data processing and analysis

Data was entered and analysed using SPSS version 23. Results were presented using means, frequencies and percentages.

For each satisfaction items, the level of satisfaction was dichotomized, thus, those who answered very satisfied and satisfied were categorized as satisfied. While, those that answered very dissatisfied, dissatisfied and neutral were categorized as not satisfied.

Ethical considerations
Ethical approval was obtained from the ethical committee of Jos University teaching hospital. A written informed consent was obtained from each participant prior to recruitment into the study.

Results
Sociodemographic and obstetric characteristics of study participants

A total of 173 women participated in the study. Majority (70%) were within the age of 20-34 years, 38 (12%) were less than 20 years and 14 (8%) were between 35-49 years and all the participants were married. The mean age of the women was 27.3 years. Greater than half of the participants had secondary level of education. Almost twenty five percent had tertiary level of education.

Table 1. Socio-demographic and obstetric characteristics of study participants at Jos University Teaching Hospital, Nigeria.

Variable	Frequency	Percentage
Age		
<20	38	12.0
20-34	121	70.0
35-49	14	8.0
Level of education		
Primary	29	16.8
Secondary	88	50.9
Tertiary	43	24.8
Informal	13	7.5
Marital status		
Single	0	0
Married	173	100
Divorced	0	0
Parity		
Primiparous	57	32.9
Multiparous	116	67.1
Mode of delivery		
Vaginal delivery	117	68.0
Caesarean section	40	16.0
Ventouse	16	9.0
Length of hospital stay		
1 day	90	52.0
2 days	20	11.5
3 days	30	17.4
4 days	29	16.8
≥5 days	4	2.3

About two third of the women (67.1%) were multiparous, while 32.9% were delivering for the first time. Vaginal delivery was the most common mode of delivery, and 9% had assisted vaginal delivery using ventouse. Most of the patients were discharged within 24hours after delivery. About 2.3% of the participants were discharged after 5days of delivery (Table 1)

Table 2: Respondents Satisfaction With Intrapartum Care At Jos University Teaching Hospital Nigeria

	Satisfied n(%)	Not satisfied n(%)
Interpersonal care		
1. Staff friendly and welcoming	149(86.2)	24(13.8)
2. Doctors and midwives encouraging and reassuring	165(95.4)	8(4.6)
3. Midwives were very helpful	150(86.7)	23(13.3)
4. Doctors were very helpful	166(96.0)	7(4.1)
5. Overall care was good	150(86.7)	23(13.3)
Information and decision making		
1. Midwives and doctors kept me informed	173(100)	0
2. Decisions were made without taken my wishes into account	0	173(100)
3. Felt pressured to have the baby quickly	0	173(100)
4. Felt labour was taken over by machines	0	173(100)
Physical and birth environment		
1. Level of light was adequate	173(100)	0
2. Room spacious and adequate	173(100)	0
3. Level of noise was appropriate	136(78.6)	37(21.4)
4. Trays and equipment were clean	173(100)	0
5. Was able to find supplies needed	159(91.9)	14(8.1)

Level of satisfaction
Among the respondents 150(86.7%) were satisfied with the overall quality of care they received while, 23(13.3%) were not satisfied. The participants expressed the lowest rate of satisfaction with the level of noise in the delivery suite.

Discussion
Majority of the participants interviewed were satisfied with the services they received at Jos University teaching Hospital. The overall proportion of mothers who were satisfied with the delivery care in this study was 86.7%. This percentage is comparable to studies done Ethiopia (81.7%)[10] and cote Ivoire (92.5%)[11] and Sweden (90%),[8] but higher than studies done in Kenya (56%),[12] Sri Lanka(48%).[13] This variation may be because of a difference in quality of services provided, expectation of mothers or the type of health facilities. The difference might also be attributed to the different satisfaction measurement tools used in different studies and the fact

that this study was conducted in a referral teaching hospital where there are relatively adequate number of health professionals and better diagnostic facilities. A qualitative study by Okonofua et al reported that most women were dissatisfied with quality of care received. Reasons included poor staff attitude, long waiting times, poor attention to women in labour and substandard facilities.

In this study we found that a high proportion of participants were satisfied with care provided by the doctors and nurses, with little more participants being more satisfied with the doctors. This is similar to findings in kano where about 90% and 86% of participants were found to be satisfied with care provided by doctors and nurses respectively.[15] Participants were particularly satisfied with the doctors explanation and their listening abilities, good communication between patients and caregivers have been described as the single most important component of a good medical care practice, not only because it identifies problems quickly and clearly but it also defines expectation and help establish trust between the clinician and the patient. In contrast bad communication, particularly when the doctors appear indifferent, unsympathetic or short of time make most patients dissatisfied. Good doctor patient relationship is in itself therapeutic and successful consultation with a trusted and respected practitioner will therefore have beneficial effect irrespective of any other therapy given. A systematic review has shown that allowing women to actively participate in decision making about their care was an important dimension of satisfaction with health facility delivery.[16]

The main goal of care providers during labour and birth is to ensure a safe and positive labour experience with minimal pain and discomfort. Even though this was not directly assessed in this study. However, there is strong evidence from high income countries that women who have continuity of midwifery care, continuous support during labour, a good relationship with their caregiver, and good support during labour and birth are more likely to require less pain relief, have intervention free labour and birth, higher perception of control, and be more satisfied with their intrapartum care.[17] In this center the husband is allowed to stay with the wife to provide continuous emotional support during labour. A lack of continuity of care and a lack of professional and social support may well increase the pain experienced by labouring women and increase their need for pharmacological methods to decrease pain during labour and birth.

Some of the factors that attract patients to a health facility are the availability of facilities, qualified personnel and cleanliness of the hospital environment. It may also be responsible for recommending the hospitals to friends and relatives. In the present study greater than 90% of the participants were satisfied with above factors, this is similar to findings in Kano,[15] Nigeria where 87% of the respondents were satisfied with the neatness and cleanliness of the hospital and labour ward. Previous studies in Jos by Chirdan et al also showed a high level of satisfaction with maternal health in both private and public hospitals in Jos Nigeria.[18] It is also comparable with reports in some developing countries.[19]

The limitations of the study include the fact that it is a hospital based cross sectional study and so does not show cause and effect relationship, it was also conducted in a tertiary health center where adequate staff and facilities are available. Another limitation is that of recall bias as some of the participants were interviewed up to six weeks of postpartum period. However, this is one of the few studies in this environment that has assessed maternal satisfaction with intrapartum care and hence forms a background for future research.

Conclusion

Overall, the study showed high level of satisfaction of patients with intrapartum care. There is a need to sustain and improve the current level of patient provider relationship, patient provider communication in the hospital environment. There is also a need to look further into the cause of dissatisfaction of the few patients that were not satisfied. Periodic patient satisfaction survey should be institutionalized to provide feedback for continuous quality improvement.

Acknowledgement

The authors would like to thank all the participants, supervisors, and staff of family health clinic of Jos university Teaching Hospital for their valuable contributions.

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Supernumerary Cervical Vertebrae - A Clinical Case Report

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Abstract

Background: The number of cervical vertebrae is constant in humans and most mammals have seven cervical vertebrae. Change in number of cervical vertebrae is associated with major congenital defects, stillbirths and paediatric cancers with a resulting high level of early mortality lethality. This report emphasizes that supernumerary cervical vertebrae can exist as an isolated anomaly.

Case Report: A 30 year old male civil servant was referred to the spine surgery unit with neck pain of 2 weeks duration. The pain radiated to the medial aspect of the left upper limb down to the fingers and is aggravated by bending the neck forwards. There was no history of weakness or numbness in the arms and hands, or swelling or in the arm with activity, no weakness of hand grip, hand dexterity intact, and no gait problems. He had no history of trauma to the cervical spine, no deformity of the spine or any neurological deficits. There was no musculoskeletal deformities or any abnormalities noted in organ system. X-rays of the cervical spine (Fig 1) showed 10 cervical vertebrae with mild degenerative changes at C4, C5. X-rays of the other aspects of the spine showed no other abnormalities . He was managed conservatively with analgesics , muscle relaxant and physiotherapy . At 6-month follow up visit patient was pain free .

Conclusion: Supernumerary cervical vertebrae though extremely rare can occur as an isolated vertebral anomaly in an otherwise healthy individual and can be associated with neck pain.

Key words: Neck Pain, Supernumerary Cervical vertebrae, Isolated Vertebral Anomaly,

Date received :28 October 2021 accepted :27 April 2022

Highland Med Res J 2022;22(1):56-58

Introduction

Supernumerary cervical vertebrae is very rare in adult humans and all mammals have seven cervical vertebrae regardless of neck length except for sloths and manatees.[1] Gallis et al showed that while about 7.5% of all human conceptions had an abnormal number of vertebrae , it was strongly selected against such that almost all of these persons die before the age of reproduction .

During human development, the vertebral bodies are formed from the 4th week as a result of migration of cells from the sclerotome regions of the somites in the ventromedial, ventrolateral, and dorsal direction.[2]

Consequently any error in this genetic programmed migration of these somites could be associated with multiple congenital abnormalities such as stillbirths and pediatric cancers leading to either intrauterine or early extrauterine death.[3] These at most cases are incompartible with life as the developing embryo dies from other lethal lesions affecting other organ systems.

Spondylocostal dystosis is a congenital disorder with multiple vertebrae and numerical and structural rib abnormalities resulting in cervico thoracic asymmetry, short stature and neck.[4.] However isolated cases of supranumerary cervical vertebrae without any other associated congenital anomalies is quiet rare which is of interest in this case report.

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Case Report

A 30 year old male civil servant was referred to the spine surgery unit with neck pain of 2 weeks duration .The pain radiated into the left upper limb down to the fingers and is aggravated by bending the neck forwards .He had no history of trauma to the cervical spine, there was no history of weakness or numbness in the arms and hands, or swelling or in the arm with activity, no weakness of hand grip, hand dexterity intact, and no gait problems. He had no deformity of the spine or any neurological deficits. There was no musculoskeletal deformities or any abnormalities noted in the organ system. Ranges of motion of the neck were all satisfactory (Fig.2). Xrays of the cervical spine (Fig 1) showed 10 cervical vertebrae with mild degenerative changes at C4,C5. Xrays of the other aspects of the spine showed no other abnormalities. He was managed conservatively with short term use of soft neck collar, analgesics and physiotherapy. At 6-month follow up visit, the patient was pain free.

Discussion

Cervical vertebrae number exhibit very low variation in humans with most people having seven cervical vertebrae. Supranumerary vertebrae are extremely rare in the cervical spine though it may not be unusual in the thoracic or lumbar vertebrae.[5] The number of cervical vertebrae is determined during the early organogenesis

stage of fetal development [6]. It is a critical stage of embryo development and should be conserved as any insult to the genetic make up could lead to death .This morbidity and mortality associated with mutation during organogenesis does not exist at any other time in development [5].

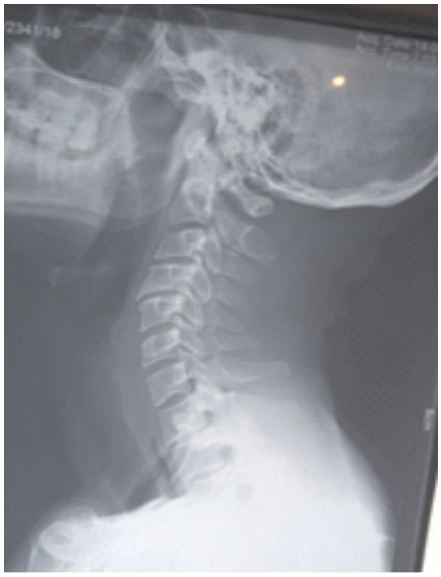
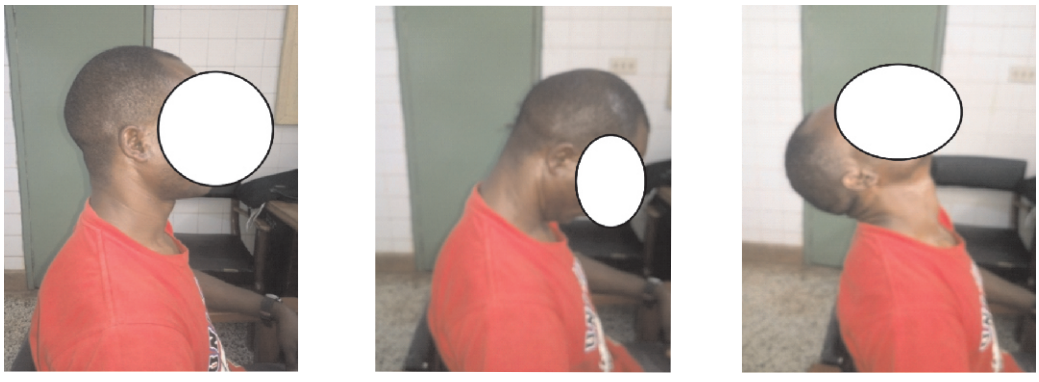


Figure 1: Lateral cervical radiograph showing 10 cervical vertebrae

Sander and Raff postulated that this strong conservation is necessary because of the high interactivity between the modules at this stage.[7,8] This high interactivity implies that any mutation will have widespread pleiotropic effects that become amplified as development proceeds . Gallis et al suggested that during organogenesis the high interactivity and low modularity of the patterning of the anterior-posterior axis in the cervical paraxial mesoderm seems to be the reason for the selective early -deaths of humans with change in number of cervical veterbrae.[1] Mutations that change the number of cervical vertebrae almost always appear to have many untoward pleiotropic effects that cause mortality in fetuses and infants [1].Hence the very rare nature of this anomaly.

There have been very few reports of supernumerary cervical vertebrae presumably as a result of this strong selection against changed number of cervical vertebrae. Barclay-Smith in 1911 noted an eighth cervical vertebrae amongst other vertebral anomalies in a young female skeleton from excavations at Sakkara in Egypt at a site that dates to 500 - 600BC.[9] Van As and Naidoo reported the case of an 11 year old with eight cervical vertebrae , thirteen thoracic vertebrae and polythelia with no neurological deficits and hence requiring no interventions [10]. We are not aware of any reports of supranumerary cervical vertebrae without any other vertebral anomalies or of any report of more than one extra cervical vertebrae .The index patient was an adult with three extra cervical vertebrae and no other clinically demonstrable vertebral or musculoskeletal anomalies. In cases where cervical ribs are associated, management is of the features of thoracic outlet syndrome. [11]



SIDE NEUTRAL FLEXION EXTENSION

BACK NEUTRAL RIGHT SIDE FLEXION LEFT SIDE FLEXION

FIG.2. VARIOUS MOVEMENTS

Steigenga et al proposed that variations of highly conserved traits like number of cervical vertebrae may be an indicator of medical risks given the extreme selection against this trait in utero.[1,2] We therefore find it interesting that the index patient has had no other medical problems however we intend to continue following up the patient .

Conclusion

Supernumerary cervical vertebrae though extremely rare can occur as an isolated vertebral anomaly in an otherwise healthy individual and can be associated with neck pain.

Clinical Message

The above case report is to highlight the existence of supernumerary cervical vertebrae presenting as an isolated vertebral anomaly in an otherwise healthy individual.

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CASE REPORT

Mayer-Rokitansky-Kuster-Hauser Syndrome, Type 2 presenting with End Stage Kidney Disease: A rare Occurrence

Odigie E Ojeh Oziegbe[1], Oseyomon G Ojeh Oziegbe[2]

Abstract

Background: The association unilateral renal agenesis, renal malformation, kidney disease in residual kidney, uterine agenesis, vaginal atresia and skeletal malformations is a rare occurrence being reported in between 1 in 5000 to 1 in 20,000 live births. It is also known as Mayer-Rokitansky-Kuster-Hauser (MRKH) Syndrome and is as a result of Mullerian duct abnormalities. It is a rare case and is associated with anomalies of the urinary tract, ovaries, kidneys. cervix and vagina. While it has been recognized worldwide, it is rare and this is the first time it is being reported in this environment presenting this late with End Stage Kidney Disease necessitating hemodialysis.

Method: The patient's history, physical examination findings and investigations were carefully evaluated. A diagnosis of End stage kidney disease thought to be as a result of the repeated Urinary Tract Infections and hypertension was made. The patient was re-evaluated in detail and the diagnosis of MRKH syndrome was made.

Conclusion: There is need for clinicians to recognize the associations between primary amenorrhea, the presence of secondary sexual characteristics, recurrent Urinary Tract Infection, skeletal muscle abnormalities as a part of the MRKH syndrome. This is important so that close follow up will be dome early to prevent or delay the onset of end stage kidney failure, as well as to bring together a multi-specialist team to manage the medical, renal, psychological and gynecologic issues that are associated with the syndrome.

Key Words: Mullerman duct abnormalities, Mayer-Rokitansky-Kuster-Hauser Syndrome, Renal Agenesis, Uterine Agenesis, Recurrent Pyelonephritis, End Stage Kidney Disease.

Highland Med Res J 2022;22(1):59-62

Introduction

Mayer-Rokitansky-Kuster-Hauser Syndrome (MRKH) is a relatively rare condition occurring in 1 in 4000-20000 live births. It is characterized by the congenital absence of the uterus and upper two-thirds of the vagina.

The problem is as a result of Mullerian agenesis caused by embryologic underdevelopment of the mullerian duct, with resultant agenesis or atresia of the vagina, uterus or both, and sometimes with associated renal defects. Patients with such are usually identified when they are evaluated for primary amenorrhea with otherwise typical growth and pubertal development. MRKH syndrome usually presents with primary amenorrhea due to the absent uterus, referred to as Type 1.[1,2]

The second presentation involves additional renal and other manifestations, usually a solitary kidney either located in the normal position or in the pelvis. Patients are at risk for repeated urinary tract infections (UTIs), pyelonephritis which could be recurrent, renal stones and eventually loss of kidney tissue leading to chronic kidney disease (Type 2).[3,4] There are sometimes also skeletal cardiac and ear abnormalities associated with Type 2.[4]

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Case Report

We report this case of a 48-year-old female who presented with recurrent UTIs and pyelonephritis necessitating antibiotic therapy and several admissions. The patient also had a history of primary amenorrhea and a congenital deformity of a smaller right leg and only two toes on the right foot.

She had been seen at a private hospital, prior to presenting at the University of Benin Teaching Hospital (UBTH) where she had surgery twice, in 2002 and 2008 to remove kidney stones. She was subsequently sent to the nephrology clinic on account of elevated blood pressure and a single ectopic kidney. She was commenced on snit-hypertensives, amlodipine, lisinopryl and antibiotics guided by microscopy culture and sensitivity reports on account of the UTI.

It was also discovered during her follow up, that she had unilateral renal agenesis and the solitary right kidney was ectopically placed in the pelvic region (Figures 1a and 1b).

She had been regular on follow up clinic from 2014 to 2022 and had developed progressive proteinuria and a progressive deterioration in renal function probably as a consequence of the repeated episodes of pyelonephritis.

At her initial presentation in 2014, there was no proteinuria and electrolyte, urea and creatinine results were within normal reference values.

Despite other clinical findings, the managing

physician did not note that the repeated urinary tract infections, hypertension, unilateral ectopically placed kidney and a history of pronounced limp due to a smaller right leg with oligodactyly may have been part of a MRKH syndrome (Figure 2). She was also seen by the Urologists who wanted to put in a stent but the patient did not have the financial wherewithal to do the surgery

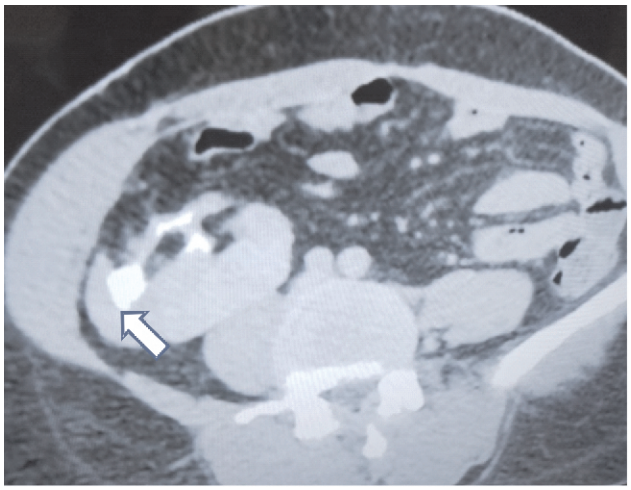

Figure 1a: Right mal-rotated ectopically placed kidney

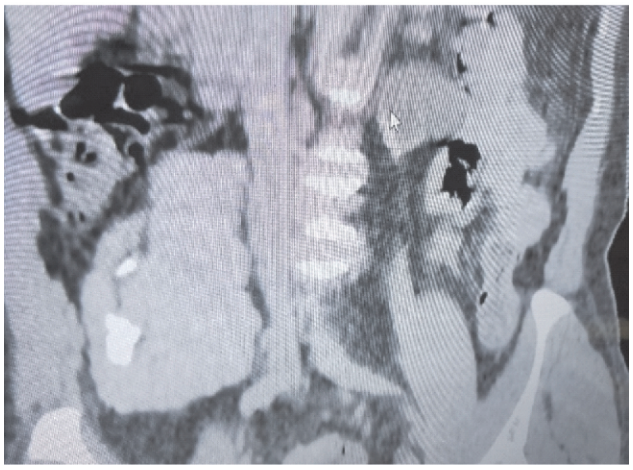

Figure 1b: Unilateral ectopic kidney

She had presented with worsening ill health, increasing weakness, vomiting and colicky abdominal pains which had become more marked in the two weeks prior to the incident presentation.

On examination at presentation, patient was markedly ill looking. There was moderate pallor, patient was in moderate respiratory distress and had bilateral peripheral pitting pedal edema. Of note was that the right leg was smaller than the left, and had oligodactyly of the right foot (patient had only 2 toes on the right leg.)

Abdominal examination showed epigastric tenderness, soft tender hepatomegaly and a central abdominal mass.

Limb examination showed a hypoplastic right leg with only 2 toes which gave her a limping gait while walking. Neurological examination, apart from the limping gait, showed that patient had asterixis. Gynecological examination done previously revealed normal secondary sexual characteristics with normal external genitalia. However, patient had a blind ending vagina.

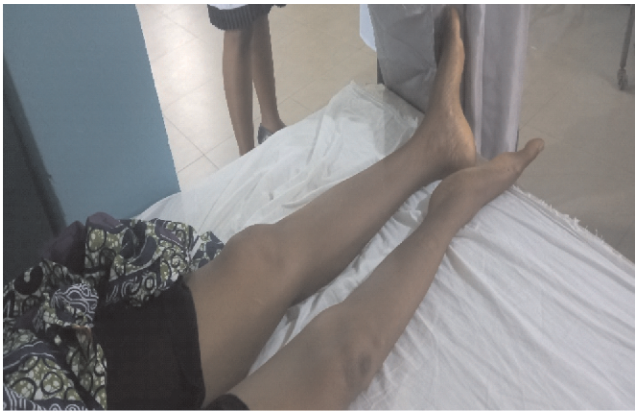

Figure 2: Hypoplastic right leg and normal left leg

Chest examinations showed tachypnea and bilateral basal crepitations. Blood pressure was elevated at 186/110 mmHg with 1st and 2nd heart sounds and a mildly enhanced aortic component of the second heart sound. There were no added heart sounds. Abdominal examination showed a soft tender abdomen 4cm below the right costal margin. Tenderness was marked in both the epigastric and suprapubic regions of the abdomen with a tender mass in the lower abdomen. Vaginal examination showed normal labia majora and minora with a shallow blind ending vaginal canal. (Figure 3).

A clinical diagnosis of chronic kidney disease with possible end stage kidney disease with uraemic gastritis to rule out UTI and pyelonephritis was made.

Patient had to be dialysed on account of the uraemic symptoms and the electrolytes urea and creatinine results which were markedly deranged.

The ultrasound results and previous CT demonstrated a unilateral malrotated ectopically placed right kidney, left renal agenesis, uterine agenesis and other features.

The reduced size of the right leg and the oligodactyly were noted.

The diagnosis of Mayer-Rokitansky-Kuster-Hauser Syndrome, Type II, with chronic kidney disease in end stage kidney disease, secondary to chronic pyelonephritis and also possible hypertensive nephrosclerosis was made.

She is currently on maintenance hemodialysis from home and is also on follow up in the Nephrology clinic and is clinically stable.

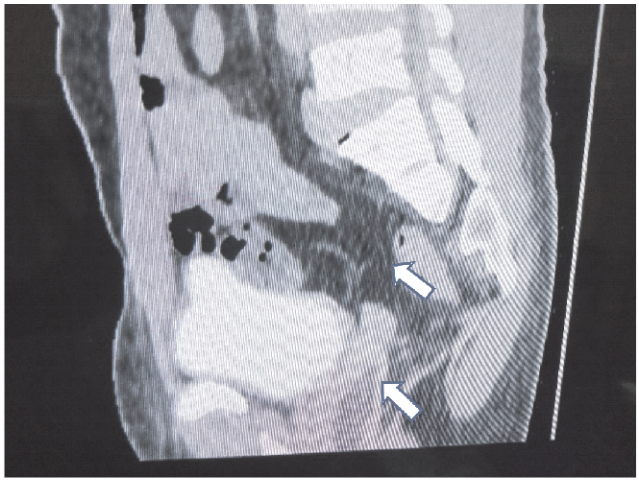

Figure 3: Blind ending vagina and uterine agenesis

She is also being referred to the gynaecology clinic to enable the gynecologists co-manage her.

Discussion

This patient had a history of recurrent UTIs that made her present to the University of Benin Teaching Hospital and was subsequently diagnosed to have Mayer-Rokitansky-Kuster-Hauser syndrome as a result of the clinical presentation and investigative findings.

Mayer-Rokitansky-Kuster-Hauser syndrome is a rare congenital disorder, said to affect about 1-4,500 to 1-5,900 live female births.[1,2] It was first reported by a Bonn anatomist and gynaecologist Mayer in 1829, and was seen over the next 130 years before it was given the name-Mayer-Rokitansky-Kuster-Hauser Syndrome, with respect to others who reported similar diagnosis of malformation.[3] It is a rare disorder characterized by the failure of the uterus and the vagina to develop properly in women who have normal ovarian function amid oftentimes normal external genitalia.[1] It is characterized by the absence of the upper two thirds of the vagina, accompanied by various types of uterine anomalies. It could be isolated or accompanied by other congenital malformations.[4]

It is subdivided mainly into type 1, which mainly presents with amenorrhea as the initial complaints and type 2 which is associated with disorders of the other organs and systems especially the kidneys and the skeletal system.[4]

Type 1 Mayer Rokitansky Kuster Hauser syndrome is characterized by a failure of the uterus and the vagina to develop properly. It could be an aplasia, where the uterus and the vagina are absent or atresia, where there may be uterus buds only with a poorly developed vagina.

The type 1 of MRKH syndrome is sometimes referred to as Mullerian aplasia. The severity the clinical presentation may vary according to the level of penetrance.

When the disorders of the type 1 described above occurs in additional physical findings, it is classified as MRKH type 2 or Mullerian duct aplasia, Renal dysplasia and cervical somite abnormalities [MURCS][5]

The affected woman with MRKH syndrome type 2 may exhibit absence of the kidney, unilateral renal agenesis, underdeveloped hypoplastic kidneys and improper positioning within the body of one or both kidneys [renal ectopia].[6] This patient had unilateral renal agenesis, and ectopic right kidney. It has also been found out that there could also be a single ectopically placed malrotated kidney.[7] Abnormalities of the extremities may include absence of a portion of 1 or more fingers or toes.

Renal abnormalities can cause growth deficiency, kidney stones and increased susceptibility to urinary tract infections and abnormal accumulation of urine within the kidney due to obstruction leading to hydronephrosis. Our index patient had all the above clinical features hydronephrosis, recurrent urinary tract infections and recurrent pyelonephritis. This tends to predispose the patient to chronic kidney disease from the chronic interstitial nephritis leading to end stage kidney disease as happened in this patient.[8,9,10] In addition, the patient had a hypoplastic right leg and foot as well as extrodactyly.[11,12,13]

Chronic pyelonephritis was most likely induced by the renal abnormality causing obstructive symptoms and stasis in the urinary tract and nephrolithiasis for which the patient had 2 previous surgeries by a urologist in a private hospital.

The frequency of renal abnormalities in MRKH is about 30 to 40%. The most frequent anomaly is the presence of a solitary kidney either located normally or in the pelvis as we had in this incident patient.[6,14] The major anatomic kidney abnormalities are a risk factor for chronic pyelonephritis induced by recurrent kidney infection. The scarring caused by chronic pyelonephritis leads to loss of renal tissue and renal function which may progress to end stage renal disease, as occurred in this incident patient.[8,13,15]

The issues raised were important because in the years of her follow up, all the symptoms and clinical features were not initially recognized as Mayer-Rokitansky-Kuster-Hauser Syndrome because the condition is rare and could end up in chronic kidney disease and end stage kidney disease.

It is important that due to the rarity of this condition, nephrologists should be alert for the existence of an association between urinary tract abnormalities, solitary kidney, skeletal anomalies and MRKH syndrome (Type II). There is need for clinicians and nephrologists to extensively assess cases such as these to possibly detect

them at an earlier stage.[13] This diagnosis was totally missed for a duration of over 7 years, the diagnosis being made for the first time at the age of 48 years. This patient would need a multi-specialist care programme involving the physicians (nephrologists and cardiologists) gynecologists, surgeons and mental health physicians to attend to her psychological needs.

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