Emergency Non–obstetric Abdominal Surgery in Pregnancy.

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Background: Despite recent advances in anaesthetic, perinatal and preoperative care, surgical intervention during pregnancy may still result in fetal loss from either spontaneous abortion (especially in the first trimester) or premature labor (especially in the third trimester). This study was aimed at determining the factors that affect fetal and maternal outcome following emergency non-obstetric abdominal surgery in pregnancy.
Methods: We reviewed all cases of emergency non-obstetric abdominal surgery performed on pregnant women at Obafemi Awolowo University Teaching Hospital complex from January 1991 and December 2006. The socio-demographic characteristics, obstetric history, diagnosis and outcome of management were documented and analyzed.

Results: A total of 46 pregnant patients presented with various conditions necessitating emergency non-obstetric abdominal surgery during the study period. Their ages ranged from 23 to 39 years with a mean age of 29.33 +/-4.904. Six (13%) of the patients presented during the first trimester, 32 (69.6%) patients during the second trimester and 8 (17.4%) were seen in the third trimester. Thirty-two (69.6%) patients presented with features of acute appendicitis out of 12 had ruptured appendicitis and 8 had appendicular abscess. Eight (17.4%) had intestinal obstruction, 5 (10.8%) had haemoperitonueum from abdominal injury and 1 (6.7%) had an ectopic foetus in bladder. Four (8.8%) mothers and 20(43.5%) babies died. Factors affecting maternal outcome included parity (P=0.010), duration of symptoms (P<0.0001) and delay in surgery (P<0.0001) while the factors affecting fetal outcome include maternal age (P<0.0001), booking status (P<0.0001), educational status (P<0.010), parity (P<0.040), gestational age (P=0.048) and delay in surgery (P=0.016).

Conclusion: Complicated appendicitis is the most common indication for abdominal surgery in pregnancy in our center. High foetal loss seen in this study can be reduced by early presentation of the patients, early booking and high index of suspicion and prompt treatment by the attending surgeon.

Introduction

Surgery during pregnancy is not an uncommon event[1,2]. Approximately 0.5- 1% of pregnant women will require surgery for non-obstetric causes[3]. Abdominal surgery for non-obstetric causes is one of the most common surgery in pregancy[4]. The rate of non-obstetric abdominal surgery during pregnancy was 1 in every 527 birth[1]. Emergency non-obstetric abdominal surgery is an important cause of poor foetal outcome and maternal motarlity[5]. Poor foetal and maternal outcome from these surgeries is usually due to delay in diagnosis and surgical intervention[6-7]. Fear of complication of negative laparatomy in a pregnant female makes surgeons hesitant to interfere surgically, leading them to await clear cut symptoms and signs of acute abdomen. In pregnancy, these symptoms and signs are blunted by the anatomical displacement of the pregnant uterus and the masking effect of the physiological symptoms of normal pregnancy such as nausea, vomiting, mild abdominal pain and constipation[8]. Delay in diagnosis and intervention result in patient presenting with complicated cases such as generalized peritonitis from acute appendicitis. For these

reasons, some had advocated that early surgical intervention should be employed, more so that there is better understanding of the anaesthetic, perinatal and preoperative care of such patients[4-6]. Some, however, adopted an initial trial of conservative management treatments before resorting to surgery in case of failure[4].

Globally, the most common cause of emergency non-obstetric abdominal surgery in pregnancy is acute appendicitis affecting 1 of every 1500 pregnancyies[6]. This is closely followed by gall stone disease and intestinal obstruction[4,6]. Although, maternal and perinatal mortality have been found to be high in Nigeria[9], little is known about the contribution of emergency abdominal conditions requiring surgery in the country. Moreover, little is known about the factors affecting maternal and fetal outcome among Nigerian population. This study was conducted to address some of the aforementioned gaps. Specifically, we aimed at establishing the pattern of emergency non-obstetric abdominal surgery including their mode of presentation and their socio-demographic pattern. The second objective was to identify the factors that are associated with foetal and maternal outcome. Thirdly, we sought to determine the complications of the surgeries and the factors influencing the occurrence of the complications. Lastly, we hoped to sensitize our professional colleagues on the need for high index of suspicion and prompt management of patients presenting with features requiring emergency live saving non-obstetric abdominal surgery in pregnancy.

Patients and Methods

This study was conducted at Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile – Ife, Osun State in southwest Nigeria. OAUTHC has a multicenter setting, with six component health facilities located in three towns, and serve as the apical/referral hospital with a coverage extending over at least three states of the country. Ife Hospital Unit and Wesley Guild Hospital have specialized General Surgical, Obstetrics and Gynaecology, and Anaesthesiology Units manned by specialists. Thus, many of the patients with medical complication during and after pregnancy seeking orthodox medical interventions within the coverage area are referred to the hospital.

The management of women with abdominal conditions requiring emergency surgery is of multidisciplinary in nature, with leadership from the General Surgery Unit headed by a General Surgeon. During and after the surgery, the obstetrician monitors the foetal, while the anaesthesiologist monitors the maternal wellbeing. If pregnancy is above thirty four week gestation and patients will require explorative laparotomy, the baby is usually delivered by abdominal route at the same sitting. After thirty four week gestation foetal survival is good in our setting. Tocolytics are given to the patient, if not contraindicated, before thirty four week gestation. Patients were resuscitated with intravenous fluid, nasogastric tube, urethral catheterization for urinary output monitoring, broad spectrum antibiotics and analgesics. Postoperative complications were managed on their merit.

Data were obtained on all 46 consecutive patients who had emergency non-obstetric abdominal surgery at Obafemi Awolowo University Hospital Complex between January 1991 and December 2006. A standardized data collection instrument was designed to extract data relevant for the study from the comprehensive register which the Consultant General surgeons maintains on all cases of abdominal surgery in pregnancy. The register contains socio-demographic and clinical information, laboratory results, the surgery perform, intra-operative finding and the outcome. Data entry, editing and analysis were conducted using SPSS version II (SPSS Institute, Chicago, IL). Univariate analysis was performed to determine the pattern of the educational status, booking status of the mother, estimated gestational age at presentation, clinical features, diagnoses and complication of the surgery. The primary outcome measures are the maternal and fetal outcome which is taken as death or alive. The

secondary outcome measures are the occurrence of complication. Educational Status, Booking Status were compared with the primary and secondary outcome measures using Chi-square and fisher's exact test where appropriate. The student's t test was used for association between continuous variables and the outcome measures. P values were obtained in this respect to determine the strength and statistical significance of the association. Statistical significance was determined at the 5% level ($P < 0.05$).

Results

A total of 46 patients had emergency non-obstetric abdominal surgery and this represent 0.18% of all deliveries and 0.18% of the major surgery and 0.09% of total surgeries done at OAUTHC within the 16-year period of the study. The patients' age ranged from 23 years to 39 years and the mean age was 29.33 with+/_ 4.904. There were 6(13.0%) primigravida and the rest were multigravidas. Except for four (8.7%) patients who did not have any formal education, the other patients had various level of education. Most of the patients (32(69.6%)) did not book during the index pregnancy at any health facility. Majority of mothers were in the second trimester of the pregnancy (32(69.9%)) (Table 1).

Table 2 shows the summary of clinical presentation of pregnant patients who had abdominal surgeries. Abdominal pain is the most common reason for presentation (42(91.3%). Other symptoms include vomiting (82.6%), anorexia (73.9%) and fever (73.9%). Two patients (4.3%) presented with irreducible groin swelling while one (2.2%) had haematuria.

The common signs seen in these patients include tachycardia (60.9%), generalized tenderness (52.2%) and pallor (47.8%). Localized tenderness was seen in 12(26.1%) patients. None of our patients presented in the hospitals within 24hours that the symptom was first noted. Ten (21.7%) presented within 48hours of onset of symptoms while 36(78.3%) presented after 48hours of symptoms.

The surgical diagnoses of the patients are presented in Table 3. Uncomplicated acute appendicitis affected 12(26.1%) patients. They all had appendectomy done. While four of the patients had appendectomy via Lanz incision, 9 patients had the surgery through midline incision. Similarly, appendectomies were done for another 12(26.1%) patients who had ruptured appendicitis with generalized peritonitis through midline incision. Eight patients had drainage of appendicular abscess done through midline incision. None of the patients had percutaneous drainage.

Abdominal injury necessitated five (10.8%) of the procedures. Four of the patients had splenectomy as a result of blunt abdominal injury from vehicular accidents while one had haemoperitoneum from mesenteric injury as a result of gunshot injury.

Intestinal obstruction from various etiology was seen in 8(17.4%) patients. Two patients had obstructed inguinal hernias and also had open herniorrhaphy done. Two patients presented with advanced rectal cancer and colostomies were done to relieve the obstruction. Right hemicolectomy was done for one woman with ileocolic intussusception. One woman with sigmoid volvulus had Hartman's procedure while small bowel resection and anastomosis were done each for patient with small bowel volvulus and adhesive band. One woman had abortion of twin pregnancy through a vesicovaginal fistula into the bladder resulting into haematuria. She had laparotomy and extraction of the fetus from the bladder.

Only 28(60.9%) patients had surgery within 24hrs of presentation. Others had delay from diagnostic dilemma, need for resuscitation and unavailability of fund necessary to procure drugs and other resuscitating agents.

Four (8.7%) mothers died after surgery. The diagnoses of the patients included ruptured appendix, appendicular abscess, intussusception and advanced rectal cancer. Sixteen (38.1%) perinatal death were.

Table 1. Educational Status, Booking Status and Estimated Gestational Age at Presentation

VARIABLE	FREQUENCY	PERCENTAGE
Educational Status of the Mothers		
Non	4	8.7
Primary	24	52.2
Secondary	14	30.0
Tertiary	4	8.7
Booking Status of the Mother		
Booked	14	30.4
Unbooked	32	69.6
Estimated Gestational Age at Presentation		
First Trimester	6	13.0
Second Trimester	32	69.6
Third Trimester	8	17.4
TOTAL	**46**	**100.0**

Table 2. Clinical Presentation.

CLINICAL PRESENTATION	FREQUENCY	PERCENTAGE
Symptoms		
Abdominal Pain	42	91.3
Anorexia	34	73.9
Nausea	28	60.9
Vomiting	38	82.6
Abdominal Distention	28	60.9
Constipation	10	21.7
Mucoid/Bloody Stool	4	8.7
Fever	34	73.9
Haematuria	1	2.2
Groin Swelling	2	4.4
Signs		
Pallor	22	47.8
Tachycardia	28	60.9
Generalized Abd. Tenderness	24	52.2

Localized Abd. Tenderness	12	26.1

Table 3. Pattern of Diagnosis (n =46).

CLINICAL PRESENTATION	FREQUENCY	PERCENTAGE
Appendicitis	**32**	**69.6**
Acute Appendicitis	12	26.1
Ruptured Appendicitis	12	26.1
Appendix Abscess	8	17.4
Abdominal Injury	**5**	**10.8**
Splenic Injury	4	8.6
Mesentery Injury	1	2.2
Intestinal Obstruction	**8**	**17.4**
Inguinal Hernia	2	4.3
Rectal Cancer	2	4.3
Intussusception	1	2.2
Sigmoid Volvulus	1	2.2
Small Intestinal Volvulus	1	2.2
Adhesive Band	1	2.2
Ectopic Foetus in Bladder	**1**	**2.2**

Table 4. Factors affecting Fetal and Maternal Outcome.

FACTORS	df	P value
Maternal:		
Maternal Age	44	0.289
Booking Status	1	0.220
Educational Status	3	0.587
Parity	44	0.010
Gestational Age	44	0.198
Duration of Symptom		
Before presentation (hour)	44	<0.0001
Delay in Surgery (hour)	44	<0.0001
Foetal		
Maternal Age	44	<0.0001
Booking Status	1	<0.0001
Educational Status	3	0.010
Parity	44	0.040
Gestational Age	44	0.048
Duration of Symptom		
Before presentation (hour)	44	0.162
Delay in Surgery (hour)	44	0.016

Table 5. Complications seen.

COMPLICATIONS	FREQUENCY	PERCENTAGE
Non	28	60.9
Anaemia	10	21.7
Wound Infection	8	17.4
Prolonged Ileus	18	17.4
Pelvic Abscess	4	8.7
Anastomotic Leak	2	4.3
Wound Dehiscence	2	4.3

recorded in our patients; these occurred in the second trimester. There were four cases of first trimester abortion. Among the remaining twenty six fetuses, two were delivered by caesarean section while others had spontaneous vaginal delivery.

As shown in Table 4, the parity of the mother, duration of symptoms before presentation and the delay between presentation and surgery significantly affected the maternal outcome ($P = 0.010$; $P < 0.0001$; $P < 0.0001$). The factors that have significant impact on the fetal outcome include maternal age ($P < 0.0001$), booking status ($P < 0.0001$), educational status ($P = 0.010$), parity ($P = 0.040$), gestational age ($P = 0.048$) and delay between presentation and surgery ($P = 0.016$). Duration of symptom before presentation did not significantly affect fetal outcome.

The complications seen in our patients include anaemia, wound infection, prolonged ileus, pelvic abscess, anastomotic leak and wound dehiscence (Table 5). The factors identified to affect the occurrence of post operative complication included educational status of the mother ($P = 0.001$), booking status ($P < 0.0001$), maternal age ($P < 0.0001$), gestational age ($P = 0.028$), and delay between the presentation and surgery ($P = 0.023$). The hospital stay after surgery ranged from 3 days to 32 days and the median is 11.0 days. The patients were seen for variable periods before they were lost to follow up. The follow up period ranged from 1month to 3year.

Discussion

The pregnant patient with acute abdomen presents unique challenges to both the Surgeon and Obstetrician. First the diagnosis of pregnancy needs confirmation at the time of presentation. Secondly, the anaemia and physiological changes that normally occur during pregnancy alter the physical findings and laboratory features of acute abdomen. Thirdly, cases of acute abdomen requiring surgical intervention in pregnancy can produce significant morbidity and mortality if not promptly identified and treated. Fourthly, the treating surgeon has limitations in the use of certain diagnostic procedures because of possible teratogenicity. Finally, the surgeon is treating two patients simultaneously, the mother and the fetus and must be aware of the potential effect of treatment on both patients at all times[10].

The incidence of acute abdomen among women who delivered in our hospital during the study period was 0.18%. Compared with previous studies[3,8], the incidence recorded in our study is low. The low incidence recorded in our study may indicate low incidence of abdominal emergency in our environment or

it may also be due to general poor report of patient with illnesses in Nigeria to hospital.

About 70% of the women in our study were in the second trimester of the pregnancy at presentation. Recent studies have shown a preponderance of acute abdominal emergency in pregnancy in the second trimester[4-6]. As shown in this study, the gestational age significantly affect the fetal loss (P = 0.048). At the second trimester the uterus is big and may not be safely manipulated during surgery, hence the high risk of delivery of a newborn too premature to survive.

As noted in previous studies, appendicitis is the most common cause of non-obstetric surgical emergency in our series[4-8]. However, we observed more cases of complicated appendicitis than uncomplicated cases. Maternal and fetal health is in serious jeopardy as a result of generalized peritonitis that set in quickly because of reduced space for the omentum to contain the spread. The high incidence of maternal and fetal mortality recorded in this study can easily be explained by the increased complicated cases in our series.

The high incidence of complicated cases could be due to late presentation to the health facility. Most women may confuse the symptoms of pregnancy with symptoms of abdominal catastrophe, in addition, to poor health seeking behaviours already documented in Nigeria. In support of this, poor health seeking behaviour is the fact that only about 30% of our patient booked in any health facility before the illness started. It was not to surprising to find that fetal outcome was significantly affected by the booking status (P < 0.0001). Majority of the mothers that died and those with adverse pregnancy outcome were not booked before presentation. This underscores the significance of improved advocacy of early booking in pregnancy in our country. Cost of hospital services is another important factor which may be responsible for late presentation in the hospital.

Unlike finding from previous studies that found gall stones to be the second common cause of acute abdomen in pregnancy[4,6], we found intestinal obstruction to be the second common cause of emergency abdominal surgery in our patients. Intestinal obstruction in pregnancy differs from that in the general population in several ways. As shown in this study, obstructed hernia, volvulus and large bowel obstruction from rectal cancer accounted for six out of eight cases of intestinal obstruction as oppose to adhesive band which is the most frequent cause of intestinal obstruction in our hospital[12].

Mortality rate of intestinal obstruction is also much higher during pregnancy than in the general population[13].

Abdominal trauma necessitated over 10% of the surgery done in pregnancy. Four of the patients had blunt abdominal injury from vehicular accident and subsequently had splenic injury. Vehicular accident is quite common in our environment due to bad road, frequent use of second hand cars and tyres, and bad driving habit[14-15]. Women who constitute 22.8% of the population of Nigeria, and who also spend 25% of their reproductive life pregnant are not spare of the menace[16]. Splenic injury is the most common abdominal organ involved in blunt abdominal injury in Nigeria[17-18]. In pregnancy, splenic tear increases with increasing uterine enlargement as this organ is compressed by the uterus against the rib cage[18]. The uterus itself is relatively resilient to injury, however, there could be complete or partial separation of the placenta from it due to the force of the injury[19].

Another important finding of the study is the role of parity and the delay in surgery in fetal and maternal outcomes. Primigravidas tend to have a poorer fetal and maternal outcome than multigravida. This is due to the fact that Primigravidas were usually made to believe that the symptoms of pregnancy are exaggerated in them than multigravidas which they are to endure. So the primigravidas tend to present late in the hospital. Delay in surgical intervention in some of our patients is multifactorial. Some of the patient present in so bad state that time is needed to resuscitate the patients.

Moreover, some patients present in the hospital with no money to procure materials and drugs for resuscitation. The role of poverty in poor health outcome cannot be overemphasized. The effects of poverty become very obvious in the setting like ours where the Health Insurance Scheme is not yet functional at the time of this study.

Over one-third of the patients had various types of postoperative complication. This is not too surprising because most of the surgery were dirty surgery which has high incidence of wound infection and wound breakdown.

Conclusion

In conclusion, we found the incidence of emergency non-obstetric abdominal surgery to be 0.18%. The factors that affect the fetal and maternal outcome include the maternal age, booking status, educational status, parity, gestational age, duration of symptom before presentation and delay in surgery. Similarly, these factors also affect the occurrence of complication post operatively. Early booking and presentation at hospital should be advocated. Similarly early diagnosis and treatment are vital to the survival of the mother and fetus.

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