Editorial: Task – based learning: Polishing of an old method of learning

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Task-based learning (**TBL**) is a method for direct acquisition of knowledge, skills and attitude under direct supervision in an adaptable workplace[1]. In contrast to didactic teaching that explore a tremendous volume of knowledge, **TBL** focuses on points of learning needed to be transferred at a particular point in time. These learning foci are used to train learners in analytical cognitive functions such as diagnostic capabilities, manual skill performance and explanation of symptoms, signs or results of investigation. **TBL** is motivating for all levels of learners[2]. At the low level of poorly educated societies hand dexterities are taught to the subordinate by the learner's senior person or direct boss. This is particularly true among carpenters, ironmongers, tailors and jobs that require handcrafting.

At high level of education a common example of **TBL** is the base of the workshops conducted for continuous professional development. In these workshops learning is conducted in groupwork where peer learning and peer evaluation is practiced to achieve certain professional tasks after which each group presents their allotted task.

TBL for the junior medical students: TBL is very useful for all grades at the college of medicine. It is a very much motivating tool particularly in the integrated system based curricula[2]. The scientific facts can easily be converted into learning objectives and accomplished using **TBL** methods. Conventional lectures, where the teacher is the sole spokesperson, and the students remain in the depth of silence, lead to poor concentration and less retention of knowledge. In contrast short interactive lectures in which the teacher speaking time is nearly equal to the student participating time, are better for delivering basic infrastructural knowledge. Lectures are supplemented with practical exercises for students to gain skills and deepen their knowledge. However, in subjects like **Basic Pharmacology**, students may find the topic tough, difficult to imagine and discriminate fact and nomenclature. Such difficulty can be reduced through **TBL** as in the following exercises:

1- **In paired exercises:** Students may shoot questions to each other e.g. one may ask about the definition and example of pharmaco-**d**ynamics and the other replies and shoot back similar questions but on pharmaco-**k**inetics.

2- **In group games:** Students can

a-either give a name of a drug and the others mention the root of administration or

b. ask about the classification and nomenclature of certain drugs and the other group replies and gives a name of a drug for the other group to mention its classification.

3- **In doctor simulation:** One student may imitate a doctor dressed in white coat and gentle attitude, explains to another patient simulating student in a simple way the action of a drug in the body (pharmaco**d**ynamics) or how the body absorbs, bra**k**es down, or secretes a drug (pharmaco**k**inatics). Thereafter, two student judges will comment on the knowledge, communication skills and attitude of the student simulating a doctor. The rest of the group will then give the final verdict with justified explanations.

4- In subsequent courses a student simulating a patient with e.g. pain during walking will be interrogated by a student simulating a doctor to show his skills in art of history taken to reach an appropriate working diagnosis. The doctor with good communication skills has to teach his patient something about the patho-physiology in muscles, arteries, or joints that leads to pain.

5- **Diagnostic skills**:These are best learned through **TBL**. Skills of history taken, demonstration of physical signs, interpretation of laboratory and radiological data and patient teaching skills can all be designed in TBL fashion.

In the normal situation, the consultant cross-examine patients and in a few minutes he/she reaches a reasonable differential diagnosis and requests what should be done next. This is because the consultant has developed with time of continuous practice an active **network of knowledge and skills**. On the other hand the student who was taught basically in lecture-rooms is a beginner with small fragmented bits of knowledge and clumsiness. Such student will find a great difficulty in integrating and tying up the fragmented facts he asks for with his awkward examination. **We as educators should understand such student difficulties because it**

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is basically our fault not his. We have taught this student in a school atmosphere rather than the real atmosphere of medical practice. We kept talking and left him always silent till he became hesitant to talk. We didn't show him real patients to talk to, and now he is rather timid and shy to talk to foreigners patients being or their relatives. This is the reason for failure of the student expression during exams.

For all this bad failure of ours, it is better to start with training students on each other to gain refined knowledge readily available in mind to develop his efficient brain network and polished skills before embarking on poor cross-examination of patients. Always,

1- Remember these young generations are very clever.
2- Remember the more **TBL** skills the students use, the more **TBL** skills they will formulate for themselves.
3- Remember to structure your scientific material into actions to be conducted as **TBL** in an atmosphere simulating the atmosphere of real practice.

The current practice in the Faculty of Medicine at Omdurman Islamic University:

The first course in the first semester in the Faculty of Medicine and Health Sciences at Omdurman Islamic University (OIU) is titled Trends in Medical Education. It is carefully designed for students to spend their very first two credit hours learning how the learning goes throughout the 10 semesters' long curriculum. The very first lecture the students attend is an interactive lecture led by the Dean of the Faculty during which he explores the pre-existing thoughts of the newcomers in the health problems in Sudan. Coming from various parts of the country as well as from the Diaspora, the students participate actively reflecting on the health problems in their localities. The Dean tactically praise participating students and request some of them to jot briefly their reflections in the whiteboard. After about 10 reasonable verses were written, the Dean requests the students to formulate a plan for their two weeks course "Trends in medical Education". 10 groups [taskforces] were then formed. Each **taskforce** go and study one of the heath problems written in the white board. The tutor facilitates their learning, helps them to develop some learning objectives and to accomplish these as small **tasks**. The **taskforce** after discussing things together, utilizes the internet, electronic and paper library to study in depth their allotted health problems to come back to the classroom and present their work in a seminar. Thereafter, students themselves are encouraged to evaluate each seminar in the presence of the Dean as the principal evaluator. At this stage the students learn that they are learners and have to educate themselves with guidance. They understand what is **PBL**[3] and what is **TBL** which harmonizes well with each other.

In semester three and four modules such as cardiopulmonary, gastrointestinal and hormones and metabolism are held. Students participate individually, in pairs or in groups to implement small specific **tasks** that empower their general learning, data interpretation, diagnostic, communication and presentation skills in professional manners. Example of a small **task** is a student in his white coat acting like a Doctor will take history of a GIT, or heart or lung symptoms from a student simulating a patient suffering from upper abdominal pain, palpitations or cough respectively, in the presence of two student judges and in front of a 12 student audience. After 10 minutes history, eliciting of signs, or explanation of the disease patho-physiology to a student simulating a patient or relative of a patient, the judges mention weaknesses observed in the performed **task** in terms of **knowledge, skills and attitude**. The 12 audience students with the tutor will then say their final verdict on the simulating doctor, patient and judges **knowledge, skills and attitude.** This goes on and on after exchanging positions. The courses end with students' evaluation of the course that culminates in the final course exam.

In semester five and six, students study urogenital, musculoskeletal, and CNS modules. **TBL** is practiced when students take history, examine the thyroid, abdomen, or conduct neurological examinations of student colleague simulating a patient suffering from renal colic, weakness in lower limbs and excessive sweating and palpitations. Students interpret formulated data and communicate with each other, in a professional way (simulating doctors and patients) in front of the judges and rest of the **taskforce**.

All the way up their learning curve, the students develop **tasks for skills in writing reports, speaking tasks, constructive criticism and evaluation of each other's tasks, taskforce seminars, modules,** etcetera (Table 1a,b and Fig. 1).

TBL for the junior medical students:

Although the clerkship activities depend on PBL mainly from patient clerking, performance of some students remain rather poor. Clerkship

training remains deficient till the following activities are strongly adopted:

Table 1a: 6th Semester female students evaluation of the CNS module
Improves concentration

	Frequency	Percent
Bad	7	8.9
Less than average	9	11.4
Average	**32**	**40.5**
Good	**22**	**27.8**
Excellent	**8**	**10.1**
Total	78	98.7
Missing	1	1.3
Total number of participating female students	79	100.0

Table 1b: 6th Semester female students evaluation of the CNS module.
Hospital experience enables understanding

	Value	Sig. (2-sided)	99% Confidence Interval	
	Sig.	Sig.		
Pearson Chi-Square	43.147	.001	.0001	.002
Likelihood Ratio	34.647	.006	.004	.008
Fisher's Exact Test	25.521	.013	.010	.016
Linear-by-Linear Association	8.791	.002	.001	.003
N of Valid Cases	76			

1- Students must attend management of emergency cases. Of course this will not be achieved unless an active program of inward and emergency room residency is adopted with clear registrar reporting system and a fixed percentage (20-30%) of the final exam marks is taken from reports of the residency period i.e "reward and punishment policy".
But, this policy will fail if it was not made clear to students from the start and if we did not preach in the right way. Don't you think this is the way our God "Alla" had made for justice for the human beings in the Day of Judgment "بشيراً ونذيرا"
2- TBL (based on simulating doctors, patients and judges) is ideal for students to empower the skills of art of history taken, demonstration of physical signs and explaining the patho-physiology of symptoms and signs and clinical reasoning

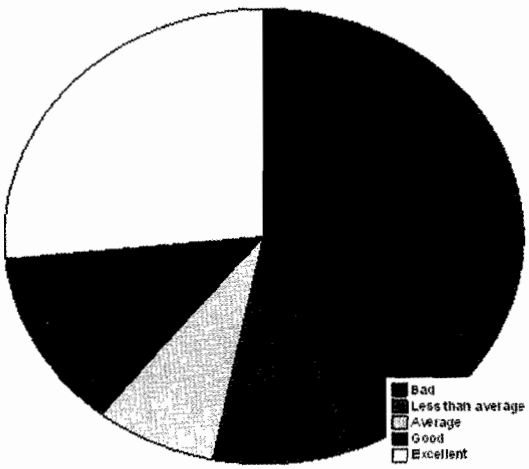

Fig 1: 6th Semester female students evaluation of the CNS module. **Contain over crowded subjects**

3- In the daily practicing, doctors work in a group, discuss with each other, request investigations, consult other specialties and sometimes admit the patient before finalizing the diagnosis. So, students have to learn to work in groups[4]. The methods of evaluation should therefore be developed to take into account the groupwork[5] within the previously mentioned 20-30% marks of the final exam. **In fact making a final judgment in 15-20 minutes during the long or short cases examination is either injustice or the students are supposed to be superior than the actual treating consultants who in many instances take hours and sometimes days to reach final decisions in the course of their patient management.**
4- The current evaluation processes deals mainly with knowledge, some skills but **does not test attitude which is the hallmark of the practicing doctor.** Therefore the evaluation must be developed[5] to take in consideration testing attitude which is taught in **TBL** in simulating doctors, patients and judges in the early semesters of integrated basic sciences as well as in real patients during the residency program.
5- The patient does not bother whether the doctor was an excellent student or not, and it is not his concern to know that you know pathology or physiology but he is certainly very much concerned with the prescription you will write to him. To improve in the art of prescription students must:

a- be allowed to suggest, discuss and justify details of management.

b- practice writing prescriptions in **TBL** exercises.

c- Explain to their simulating patients in **TBL** exercises the dosage, methods and timing of administration of drugs, and the pharmaco-**d**ynamics (Actions of the **d**rug in the body) and pharmaco**k**inetic (how body brea**k**down drugs) of the drugs they presumably have prescribed.

d- The teacher and students should realize that vague answers such as i.v. fluid, antibiotics, painkiller are **signs of ignorance, poor conduct and outcome failure of the teacher before the student.** The medical students in spite of passing difficult subjects like anatomy and biochemistry are very poor in drug prescribing skills. This is probably because of:

i. Monotonous and dull teaching of pharmacology

ii. Deficiencies in teaching of therapeutics.

iii. Poor motivation for developing prescribing skills.

iv. Absence of short courses or periods to be spent in practice in pharmacies.

v. However, these presumption needs to be studied carefully.

6- Tutorials on problem based pharmaco-therapy [6,7] should be held on weekly bases because appropriate prescribing skills are important for the management of the patients and to protect junior practicing doctors against litigations.

7- To achieve successfully good outcome the last quarter of each clerkship should be a serious preparatory period for the future internship. At least the last 4 weeks should be spent in full fledged residency program with in depth involvement with registrars and house officers through out their 24 hours casualty and inward duties, outpatient clinics, and other activities. This Part of the training should have meticulous reporting system to gain the award of 20-30 marks of the final exam or to have the punishment of loosing these precious marks. On so doing attitudes of students to absent themselves in the last few weeks before the exam will be cured

TBL will help creating connections of knowledge network in the student mind, refining his dexterity and polishing his communication skills and attitude. Therefore, **TBL** helps ''to produce doctors who will promote the health for all people'' which is the theme of the Declaration of the World Federation for Medical Education[8] since 1988. Utilizing **TBL** methodology, the "tomorrow's doctors" will conceptualize better mechanisms underlying **tasks** they perform in the real patient, acquire competences in clinical reasoning, elect the best and most appropriate for each and every particular patient

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Patterns of digital volume pulse waveform and pulse transit time in young and older individuals

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Abstract:

Introduction: Arterial wall changes underlie many disorders of aging and the complications of diseases like hypertension and diabetes mellitus. Analyzing the pulse wave is an easy, noninvasive method used to assess vessel wall stiffness and pulse changes. In this study the digital volume pulse wave and the pulse transit time of the thumb and big toe were analyzed in young and older subjects some of whom were hypertensive. We aimed to study the components and patterns of the pulse waveform and the pulse transit time and how they might change.

Material and Methods: Seventy volunteers were drawn from the students and employees of the University of Khartoum. A Powerlab system, ECG leads and a Pulse Mechanotranducer were used. SPSS programme was used for analysis.

Results: Young subjects had two main patterns of digital volume pulse waveform in the thumb and two patterns in big toe. The older subjects showed significant decrease in prominence of the diastolic pulse flow waves in both thumb and toe. There was a significant decrease in pulse transit time with advancing age.

Discussion: The prominence of systolic deflections combined with decrease in diastolic deflections in the digital waveform in older subjects indicated shift in blood flow towards systole. Changes of pulse waveforms are more prominent in the feet than in the hands. The decreased pulse transit time could explain some, but not all of the observed changes especially in the feet. Digital volume waveform analysis can be developed into a bedside test.

Keywords: arterial stiffness, digital volume pulse, pulse transit time, hypertension

Introduction

Arterial wall changes like arteriosclerosis and atherosclerosis are involved in the pathogenesis of age associated disorders and the various complications of diseases like arterial hypertension, diabetes mellitus and hyperlipidaemia. Arteriosclerosis which is characterized by generalized increase in arterial wall stiffness is commonly seen with advancing age and in patients with hypertension[1]. The stiffness of arterial walls results in decreased compliance, and an increase in the speed of transmission of the pulse wave. This increase in pulse wave velocity (PWV) is the cause of early return of reflected waves that lead to high aortic pressure which is detrimental to the left ventricle[2]. Arterial wall changes, therefore, have two main detrimental effects: ischaemia of various tissues due to noncompliant thickened vessels and increased afterload on the heart due to early wave reflections.

Assessment of the condition of arterial walls should be considered a prognostic parameter in cardiovascular diseases, in addition to measurement of blood pressure and blood lipids[3]. Efforts are now directed towards determining which parameters of arterial wall changes are of prognostic value. Several researchers have addressed the issues concerning the various methods used to assess arterial stiffness and their clinical applications and were discussed[4].

It is possible to study the structural changes of the arterial tree using various imaging processes like arteriography, ultrasound and MRI. However, we are mainly concerned with structural changes that affect the functions of arteries: the conduit function and the cushioning function[5]. That is why researchers have concentrated on methodologies that analyze the pulse: the speed of its transmission (PWV), the shape of its waveform and the pressure changes during a pulse. However, most attention has been directed to PWV and peripheral pulse pressure and how these can be used to predict central arterial pressure changes. Not much attention has been directed towards assessing the prognostic value in arterial disease of changes in the pulse waveform.

One simple method is to study the pulse waveform of a digit to record the digital volume pulse (DVP). Fingers are often used. Researchers have recorded DVP using photoplethysmography and compared it to direct measurements of arterial pulse pressure using applanation tonometry. There is a simple linear relation between the shape DVP and that of the pulse pressure[6].

Assessing the speed of transmission of the pulse wave can be done by measuring the time needed for a pulse to travel from the heart to a peripheral site like a digit. This is the pulse transit time (PTT). The investigator needs to perform simultaneous recording of the ECG and the pulse

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wave. PTT is equal to the time interval between the peak of the R wave in the ECG and the beginning of the pulse wave. As the PWV increases, the PTT will decrease[7, 8].

In this study we used a pulse mechanotranducer and a Powerlab system, aiming to determine the pattern of the DVP waveform and PTT of the thumb and big toe, in young healthy individuals and compare that to older subjects some of whom were hypertensive.

Methods

Subjects: Two main groups of volunteers were selected randomly. Those fulfilling the requirements for inclusion were enrolled until we reached the planned sample size. The subjects were enrolled into two groups: those <40 years of age and those >40 years. Both groups were equally divided into males and females. The first group comprised forty healthy young volunteers (20 males and 20 females) age range 18-28 yrs. The second group comprised thirty older volunteers (15 males and 15 females) age range 40 – 65yrs. Ten individuals of this group of older subjects have controlled hypertension. The remaining twenty were healthy subjects who had no history of chronic disease and were normotensive at the time of the study. The hypertensive patients were on antihypertensive therapy.

Materials: Data collection was done by a Powerlab system connected to a computer running the Chart V5.0.2 4310 software (ADInstruments/Australia). Piezo-electric MP100 pulse transducer (ADInstruments) was used to record the digital volume pulse. It is applied to a digit and held in place by a Velcro strap. ECG was recorded using adhesive MLA1010 ECG electrodes (ADInstruments). Arterial blood pressure was measured by the electronic sphygmomanometer KBM-21 digital blood pressure monitor.

Test procedure: This study was carried out in the period June to September 2005. The study was conducted in a laboratory in which the temperature was kept at about 25^{O} C. All the steps were carried out by the same doctor throughout the study. Initially, a questionnaire regarding the subject's personal and health details was filled by directly questioning the subject. After 5 minutes of bed rest, the blood pressure was measured. The pulse transducers and ECG leads were then applied with the patient lying supine on a couch. ECG limb leads were used. One pulse transducer was applied to the left thumb and the second one to the left big toe. The subject was asked to stay still during recording. Real time recording appeared on the computer screen. The digital pulse waves from the thumb and toe were recorded simultaneously with the ECG on the same time scale and in the same chart.

The pulse transducers were disconnected and reapplied three times and each time a 12 seconds recording was obtained so that each subject provided three recordings at the same session. The 12-second period was selected to insure a whole respiratory cycle recording.

Determination of systolic and diastolic events: ECG was used to determine whether an event was systolic or diastolic. Systole starts at the R wave and diastole at the end of the T wave of the ECG[9]. For each cardiac cycle the peak of the R wave is considered "zero time". For other sites of the circulation the pulse transit time should be added i.e. a diastolic event at the thumb occurs after a time interval equal to the sum of the time at the end of T plus the pulse transit time for the thumb.

Statistical analysis: For each subject in the study, the mean and standard deviation were calculated from ten pulse waves for each of the variables (pulse wave components and time intervals) using the Excel program and SPSS 13.0. The frequency of each pulse wave component was expressed as a percentage of the total subjects in each group. T-test was used to determine the significance of differences between groups.

Results

The thumb pulse wave of young subjects:

The thumb waveform showed five deflections that had been labeled **a**, **b**, **c**, **d**, and **e** (fig 1A). The deflections "**b**" and "**d**" are downward deflections. Deflection "**e**" is diastolic while the others are systolic. This pattern (thumb pattern 1) was seen in 63% of the young subjects in the study. The remaining 37% showed a pattern (thumb pattern 2) in which the "**b**" and "**c**" deflections seemed to have been incorporated into a broadened "**a**" deflection, and "**e**" is low relative to "**a**" (Fig 2A).

Deflections "**a**" and "**e**" were constant and were present in 100% of the young subjects of the study. Deflection "**d**" was absent in 16% of the young subjects. The patterns appeared the same for both male and female subjects.

The big toe pulse wave of young subjects:

The waveform of the big toe in young subjects showed two deflections; an upward "**a**" deflection followed by a downward "**b**" deflection (Fig. 2B). Both "**a**" and "**b**" were systolic. This

Figure 1: thumb and big toe pulse waveforms in young adults.

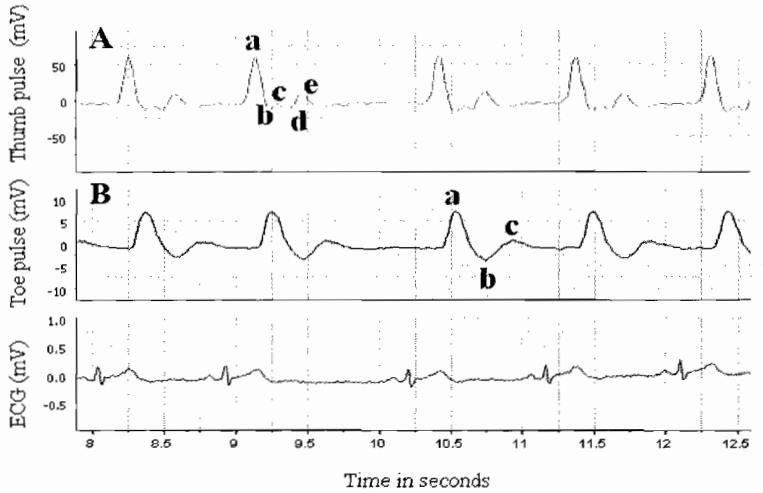


Figure 2: thumb and big toe pulse waveform in young adults

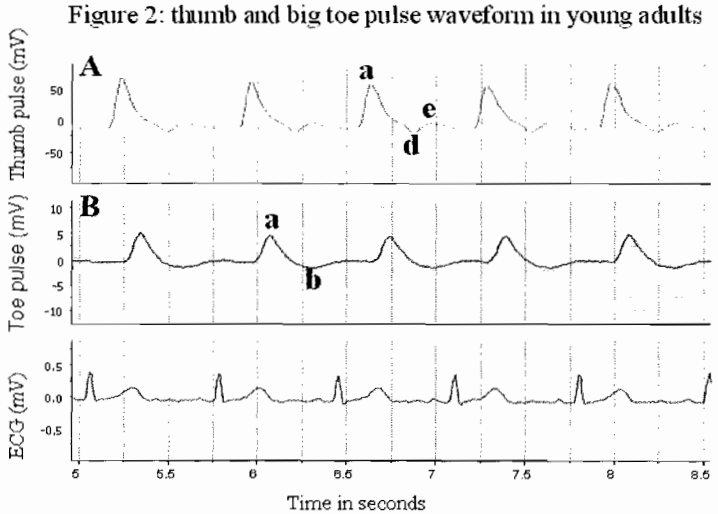
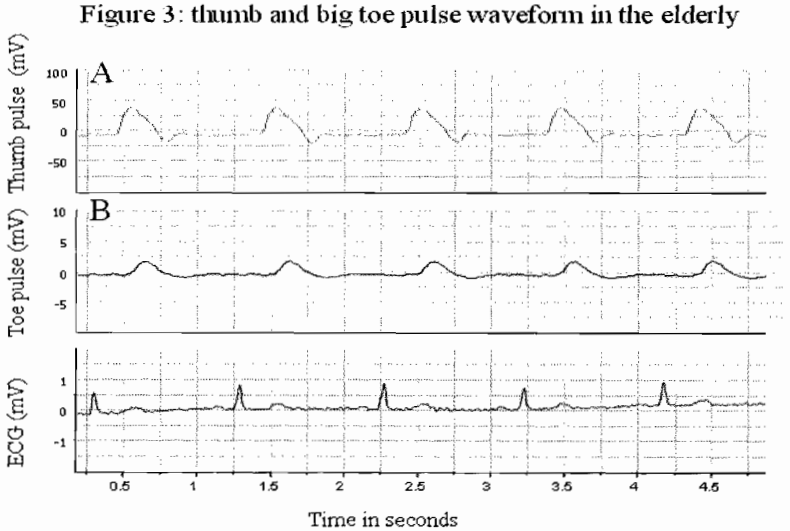


Figure 3: thumb and big toe pulse waveform in the elderly



pattern (toe pattern 1) was seen in 67% of the young subjects. 33% of the young subjects showed an additional upward diastolic deflection; the **c** deflection (Fig 1B). This is "toe pattern 2". The patterns appeared the same for both male and female subjects.

The pulse waveform of older subjects:

The thumb pulse waveform in subjects who were >40 yrs showed a broad "**a**" deflection and a low "**e**" deflection (Fig.3 A), similar to "thumb pattern 2" of young subjects. Their toe pulse waveform (Fig.3 B) was similar to "toe pattern 1" of the young subjects which did not have a diastolic deflection.

The pulse waveform of hypertensive older subjects:

The thumb waveform of hypertensive older subjects was characterized by a broad "**a**" deflection and a low "**e**" deflection (Fig. 4A), as in nonhypertensive older subjects. The big toe waveform of 60% of hypertensive subjects was toe pattern 1 of young subjects although the "**b**" deflection appeared shallower. However, in 40% of hypertensive subjects the toe pulse was made of one upward systolic deflection; the "**a**" deflection (Fig. 4B).

The duration of the pulse wave of the thumb:

There was no marked difference in the duration of the pulse wave from the beginning of "**a**" deflection to the end of "**e**" deflection between the different groups in the study. However, the "**a**" wave clearly got broader with advancing age (Table 1) and was significantly different between the young and the normotensive older subjects (P=0.003) and hypertensive older subjects (P=0.001). There was no difference between normotensive and hypertensive older subjects.

The PTT of the thumb:

Table 2 shows that the PTT of the thumb got shorter with age and was significantly different between the young and both the normotensive older subjects (P=0.0001) and hypertensive older subjects (P=0.0001). The PTT of the thumb was not different between the normotensive and hypertensive older subjects.

The PTT of the big toe:

Table 3 shows that the PTT of the big toe decreased from 0.24 ±0.02 seconds in the young to 0.2 ±0.03 seconds in normotensive older subjects, and to 0.17 ±0.03 seconds in hypertensive older subjects. The mean PTT of young subjects differed significantly from that of older normotensive subjects (P=0.0001) and that of hypertensive older subjects (P=0.0001). The mean toe PTT of normotensive and hypertensive older subjects was not different.

Discussion

During our review of the literature, we noticed that much of the research about arterial disorders in hypertension, diabetes mellitus, and hypercholesterolaemia relied on evaluation of the central blood pressure in the aorta, because it is of good predictive value for complications. Consequently, measurements of PWV, peripheral arterial pulse wave and digital volume pulse were routinely processed by formulas to calculate the augmentation index for central blood pressure[10]. This seems to us to be no more than measuring blood pressure by other means, and then continue using it as the major prognostic indicator.

In this preliminary study, we aimed to investigate the patterns of peripheral pulse waveforms whether they show predictable changes that can make them potential indicators of arterial wall disorders and disorders of blood flow. We analyzed the waves resulting from the cyclic fluctuation in the volume of the digits, caused by fluctuation in digital blood flow during the cardiac cycle[5]. Our results demonstrated that there was a pattern of the wave of the digital volume pulse that changed significantly with advancing age in both normotensive and hypertensive individuals. Young adults showed two patterns of the thumb volume pulse wave. Pattern 1, the commoner of the two, was characterized by fluctuating systolic blood flow (several waves in Fig.1A), whereas pattern 2 showed a longer period of flow during systole (broad "**a**" deflection in Fig. 2A). It is not clear to us what factors result in healthy young individuals having different patterns of digital blood flow. We found no evidence that these patterns are related to gender. Figures 3A and 4A show that in the older group systolic thumb blood flow is increased, with less diastolic flow (wide "**a**" deflection and diminished "**e**" deflection). However, it is clear in all our figures that the "**e**" deflection represents the early part of diastole and we can not, therefore, conclude that total diastolic flow was diminished. It is worth noting that there was no significant difference between the study groups in the length of the pulse wave cycle (start of "**a**" to end of "**e**" in Table 1) of the thumb, but it was the configuration of the component deflections that changed, indicating shifts in flow between systole and diastole. Our results demonstrated that flow to the digits shifted towards systole in older subjects, both normotensive and hypertensive.

The toes also showed various patterns of volume pulse waveforms. However, there is a notable difference between the thumb and big toe

Figure 4: thumb and big toe pulse waveform in hypertensives.

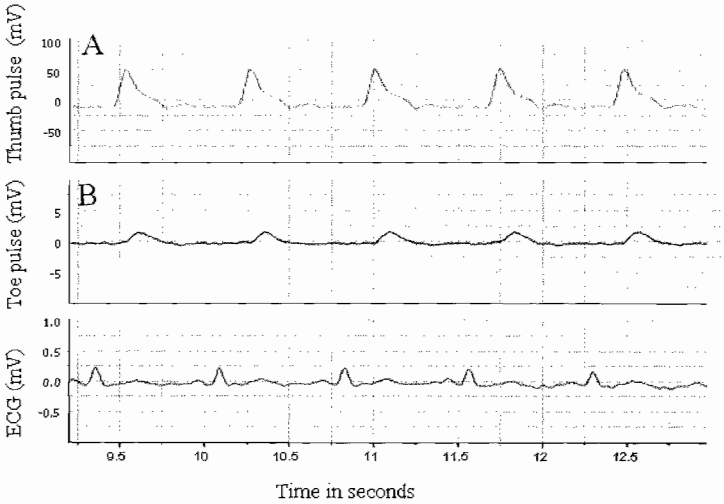


Table 1: Duration of thumb pulse wave cycle and duration of "**a**" deflection.

Group	Duration of "**a**" deflection in seconds	Duration from start of "**a**" to end of "**e**" deflections in seconds
Young males (n=20)	0.168 ±0.018	0.518 ±0.026
Young female (n=20)	0.183 ±0.033	0.523 ±0.037
Older males (n=10)	0.257 ±0.039	0.517 ±0.048
Older females (n=10)	0.271 ±0.038	0.537 ±0.047
Hypertensive males (n=5)	0.266 ±0.063	0.511 ±0.049
Hypertensive females (n=5)	0.281 ±0.015	0.516 ±0.042

Table 2: Mean and standard deviation for thumb PTT.

Group	Mean thumb PTT and SD in seconds
Young male (n=20)	0.143 ± 0.019
Young female (n=20)	0.134 ±0 .013
Older males (n=10)	0.118 ± 0.022
Older females (n=10)	0.114 ± 0.017
Hypertensive males (n=5)	0.110 ± 0.014
Hypertensive females (n=5)	0.116 ± 0.020

regarding the changes that occur in older subjects. Thumb pulse flow shifted towards systole (see above) whereas toe pulse flow was reduced in both systole and diastole, as demonstrated by the diminished size of the "**a**" and "**b**" deflections (compared to the young) and the complete absence of the "**c**" deflection (Fig. 3B and 4B).

The changes seen in the thumb volume pulse of the older individuals could be explained by the short PTT, which led to early wave reflection causing a rise in central systolic pressure and a decrease in diastolic pressure[1,2,7]. However, the changes seen in the big toes of the same group - where there was a decrease in the volume pulse in both systole and diastole- indicate that factors other than PWV/PTT and central pressure are involved. This gives credibility to our argument that the pulse waveform should be evaluated independently in arterial disorders. We would also argue for assessment of peripheral pulse waveforms at different sites and not to rely only on fingers because apparently different sites show different changes. Clinicians are aware that ischaemia affects the feet more than the hands.

The hypertensive subgroup of older subjects in this study was controlled by antihypertensive treatment and they fell in the same age group as the nonhypertensive older subjects. Their thumb volume pulse waves were not different. However, there was a difference in toe volume pulse waves between the two groups. The difference was the absence of the "**b**" deflection in 60% of hypertensive individuals. Again, toes seem to show circulatory changes earlier than fingers.

Pulse wave analysis is simple and noninvasive. It has the potential to be developed into a simple bedside technique. We recommend more detailed studies of the pattern of pulse waveforms and their possible use as diagnostic/prognostic indicators of arterial disorders. Large scale surveys of different age groups, male and female of both healthy individuals and patients with various cardiovascular diseases are needed.

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Major limb amputations in El Obeid Hospital, Western Sudan

El Bushra Ahmed Doumi[1], Aisha Jabir Ali[2].

Abstract:

Objectives: To study the causes and pattern of major limb amputations in El Obeid Hospital, Western Sudan.

Patients and methods: The records of 50 major limb amputations performed in patients admitted to the University Surgical Unit at El Obeid Teaching Hospital, Western Sudan in two years were retrospectively studied.

Results: 72% of the victims were males. The mean age was 51 years ± SD 34.5. 36% of the amputations were emergency procedures. Sepsis, trauma and vascular causes accounted for 40%, 32% and 16% respectively. The upper limb amputations were due to crushed missile injuries, lacerated wounds of animal bites and gangrenous limbs after post-fracture tight splintage by traditional bone setters.

Conclusions: The study showed that 96% of the causes were potentially preventable, and that establishment of a Prothetic-Orthotic Centre is needed in this part of the country.

Key words: Limb amputations.

Introduction

Amputation is one of the oldest surgical procedures dating back to prehistoric times. It was described in the Babylonian code of Hammurabi inscribed on black stone, some 1700 BC[1]. It is estimated that 1.2 million individuals are living with an amputation; and that 185,000 are performed each year worldwide[2]. Major limb amputation is defined as any amputation at or proximal to wrist or ankle[3]. Limb loss has a devastating impact on patients. Its impact can be a frightening and challenging experience for the amputees and their families. Amputees become the responsibility of the health service[4] and if not well looked after, they may continue crippled for life. This is the first documentation of this problem from the central west of Sudan.

Patients and methods

Fifty patients had major limb amputations in the wards of the University Surgical Unit, El Obeid Teaching Hospital, Western Sudan; from March 2004 to February 2006. The records of those patients were retrospectively studied to the pattern, causes and outcomes of those procedures. The data were analyzed using the SPSS computer package.

Results

There were 50 patients, 36 of them were males (72%) with a male: female ratio of 2.6:1. The age distribution is shown in table 1. 52% of the patients were from El Obeid town or nearby locality, where as 48% of the patients came from distant rural areas. 37(74%) patients had lower limbs and 13 (26%) patients had upper limb amputations. 33(66%) patients had elective operations. The commonest indication for amputation was sepsis (40%), followed by trauma (32%), vascular (16%), mycetoma (8%) and cancer (4%). Comparison between the causes of amputation found in this study and the causes found in another study done in Khartoum was shown in table 2.

Table 1 : The age distribution.

Age in yrs	No.	%
00-15	11	22
16-30	10	20
31-45	02	04
> 45	27	54
Total	50	100

Table 2: Causes for amputations in El Obeid (OBD) and Khartoum (KRT).

Cause of amputation	% OBD * n=50	% KRT** n=170
Sepsis	40	30
Trauma	32	42.4
Vascular	16	04
Mycetoma	08	17.6
Cancer	04	3.5
Congenital malformations	00	2.5
Total	100	100

*OBD = Study in El Obeid Teaching Hospita.
**KRT = Study in National Prothetic-Orthotic Centre in Khartoum, Sudan[5].

Discussion

Amputation is as old as mankind. Today, it is performed as a form of treatment and not a purely life-saving procedure in response to injury or disease[2, 3]. Later the target in amputee rehabilitation must be restoration of body image and to return an individual to an active productive

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role in the community. The data addressing this group of patients in developing countries are scarce[4, 5]. We could trace only two previous reports in a large country with diversities and many conflicts like Sudan[5,6].

In this study 36(76%) patients were males. Males were more prone due to their exposure to trauma and possibly were more at risk for vascular atheromatous diseases by their smoking habits. 17(32%) patients underwent emergency procedures mainly for crushed lacerated wounds, fulminated sepsis or gas gangrene in diabetics.

Sepsis was the main cause of amputation and accounted for 20(40%) patients, followed by trauma which accounted for 16 patients (32%). In Khartoum the main cause for amputations was trauma (42.4%), followed by sepsis which accounted for 30%[5]. It is interesting to notice that in both series, trauma and sepsis accounted for 72% of cases[7]. Similar reports were published from other African and developing countries like Kenya, Nigeria, Niger, Malaysia, Saudi Arabia, and Ethiopia[7-15] .Such pattern was also reported in the developed countries like United Kingdom in the Nineteenth century[16]. Recent causes of amputations in the developed world were vascular particularly atherosclerosis, and tumor related[17, 18]. Most of the amputations for sepsis in our study were performed in diabetic patients (32%), compared to 24% diabetic amputations in Khartoum series. Diabetic angiopathy, neuropathy and susceptibility to infection were predisposing factors; but the situation was made worse by ignorance, inadequate control, lack of foot care and scarce facilities for free service in our health delivery system.

Trauma accounted for 32% of the amputations in this study. The main causes were Road Traffic Accidents in 3 patients, crush missile injuries in 4 patients, lacerated wounds of animal bites in 3 patients and gangrenous limbs due to post fracture manipulations and tight inappropriate splintage by traditional bone setters in 6 patients. Similar tragedy resulting from practices of native healers was reported from African communities[8, 19, 20]. Such miseries are definitely preventable through health education and the provision of a user-friendly health delivery system. Eshete described that offering a one-day instructional course to bone setters and two-day courses to local health assistants about the safe care of fracture, resulted in marked reduction in amputations[20].

Thirteen patients (26%) had major upper limb amputations. This is similar to the finding in Nigeria[19]. However, it is different from reports from Kenya[7], Saudi Arabia[14] and Thailand[21].

Vascular causes constituted 16% of the study sample. Amputations were mainly performed in elderly patients with chronic limb ischaemia presenting with severe ischemic rest pain and/ or gangrene. Absence of special investigations in this hospital like Doppler Ultrasound and angiograms was responsible for the possible delay in diagnosis and implementation of definitive early vascular treatment in some cases. In the developed societies vascular disease is the major cause of lower limb amputations[16, 18].

Mycetoma foot is a special type of infection. It is a chronic, granulomatous, progressive and relatively painless inflammatory disease that involves the subcutaneous tissue after traumatic inoculation of the causative organism[22]. The victims were mainly farmers and herdsmen presenting late with ugly lesions and useless feet that necessitate amputation[23]. In this study mycetoma foot accounted for 8% of the amputations, where as it was 17.6% in the study reported from Khartoum[5].

Among this study group, one diabetic patient presenting with Fournier's gangrene of the scrotum and gas gangrene of the foot died with septicaemia after a high above knee amputation. We could trace the death of other 3 patients at home for unknown exact reasons within 30 days of the amputation, accounting for an overall mortality rate of 8%. Mortality rates ranging from 8.5% to 16% were reported[7, 11, 16].

Knowledge about the underlying causes of limb amputations would be helpful in planning public health strategies in each community. Sepsis including mycetoma, trauma and lower limb ischaemia, accounting for 96% of the causes in this study; are all potentially preventable diseases. The establishment of a special Diabetic Care Centre to high light foot care, aggressive management of diabetic foot lesions and to formulate local guide lines following St. Vincent's Declaration[24] is needed.

The responsibility towards amputees must include provision of artificial limbs, together with the maintenance and replacement of the artificial limbs supplied[25]. The fact that our amputee patients have to travel hundreds of miles to the only Prosthetic-Orthotic Centre in Khartoum is neither practical nor acceptable. It is our moral duty that such a vital service for this special group

of patients should be available in a reachable and easily affordable manner.

Discussion

Amputation is as old as mankind. Today, it is performed as a form of treatment and not a purely life-saving procedure in response to injury or disease[2, 3]. Later the target in amputee rehabilitation must be restoration of body image and to return an individual to an active productive role in the community. The data addressing this group of patients in developing countries are scarce[4, 5]. We could trace only two previous reports in a large country with diversities and many conflicts like Sudan[5, 6].

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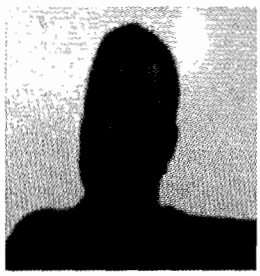
Publication Voting Power (PVP): method of finding Evidence-Support

Suliman, M. O. M*

Abstract

Background: Extracting the best evidence that support a procedure is a difficult, time consuming task that needs expert statistical knowledge. A way to make weighting evidence more simple and straight for busy clinicians is needed.

Methods: The publications about the procedure under question are lined in an ascending order of strength of their evidence according to the research type. Each publication type is assigned a voting power that reflects its level of evidence. An arbitrary start of the voting power is put at 0.5 an increased by 0.5 successively. For each procedure the powers of the publications that support it are added together to make its final voting power.



Results: The procedure with the highest voting power will be the one supported with more evidence. In the example given, the procedure with the highest vote for portal hypertension is distal splenorenal shunt and for peptic ulcer disease is partial gastrectomy.

Conclusions: A simple method to get an evidence-based support to a procedure is described. It depends on putting the publications in a hierarchal order and assigning a power (Publication Voting Power) to each. As much publications as possible should be sought to make the choice more truthful.

Key words: Evidence based medicine, surgical procedures

Introduction

The Sudan Society of Gastrointestinal and Liver diseases asked me to give an evidence-based talk about surgical treatment of upper gastrointestinal haemorrahage. I entered the Internet thinking that I will find, easily, the evidence that leads me to the best surgical way of dealing with such a wide and difficult topic. I actually entered into the dilemma of evidence-based medicine! Apart from the technical difficulties that make finding evidence from the net a hard, time consuming task, it is even harder to compare, evaluate and draw a conclusion from the numerous, diverse publications. I started to read about evaluating the evidence trying to avoid the complicated statistical procedures. The task is almost impossible to be done in the short time (a week) given to me. What about a surgeon who needs a quick answer (hours) for a bleeding patient! What adds to the confusion is the difference between the publications that are put under the same research type. Randomized controlled trials, that are considered the cream of research, are subdivided into good, bad and in-between. Good randomization but no blinding. Good selection of cases, bad randomization. Good everything, bad statistical analysis. Endless variables that can make the study good or bad[1,2]. Even the values of these variables are not agreed upon. What I want to do in this article is to describe a way by which finding evidence becomes a simpler task. Hopefully this method will be reliable enough to be safe and useful.

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Literature Review:

There is great difference in the grades of recommendation suggested by different authors. Palmer in the Guidelines[3] of upper GIT haemorrhage suggested a grading system that deals directly with the research type. Wright and associates gave a complicated grading[4] system that depends on another grading system that deals with the level of evidence. To determine the level of evidence one has to analyze in depth each publication[5]. Even after this elaborate study, some have their reservations[6]. The grading systems are revised and made more detailed and, necessarily, more complicated. An example is that which was developed by the Scottish Intercollegiate Guidelines Network Grading Review Group[1]. This detailed grading is good for guidelines developers as they have time and money, but a busy clinician is urgently pressed to find an evidence-based solution to an acute problem.

As Hans wrote[7] :(Many areas of uncertainty exist in surgical practice ranging from the indications for surgery to the preferred surgical management and the perceived outcomes following treatment). This triad is all present in the question I am trying to solve now; what is the preferred surgical management for acute upper GIT bleeding? Instead of suggesting a quick, simple way of getting and weighting the evidence, Hans put a pre-requisite for this: (evidence-based practice involves the application of tools to facilitate the acquisition and integration of information from these sources in the clinical setting). Tools mean complicated statistical analysis that a busy clinician may have neither

time nor expertise to do when an urgent clinical setting presses upon him!

Although in my present situation I am not really pressed by an acutely bleeding patient, I imagine myself dealing with such a condition. I want something simple, quick and useful. Something that gives weight to the publication without struggling with complicated statistics.

Materials and Methods

I started with the publication type that was written at the end of each abstract or full text. If no publication type was written, then I read the (patients and methods) section to know the type of publication. Helped by articles that were written to evaluate types of research, I arranged the publication types in their order of importance, almost following the hierarchy of the Scottish Group[1]. A good way to test the validity of the publicaton is to calculate the Absolute Risk Reduction. This can be explained by the following example:

If we treat 48 patient with a particular procedure (A) and 6 out of them died compared to 77 patients treated with another procedure (B) but 7 patient died

$$ARR = \frac{6}{48} = 0.125\% \qquad \frac{7}{77} = 0.09\%$$

ARR = 0.125- 0.09 = 0.035 i.e. 35 patients in every 1000 cases will be saved from the bad effects of procedure A whatever the P value is.

They came in the order shown in table (1).

Table (1) Publication Types with their Voting Powers

Type of the study	Vote
Case Study	0.5
Comparative	1
Case Control	1.5
Cohort	2
Randomized controlled trial	2.5
Meta Analysis	3

The next step was to create a way by which each publication was measured according to its rank of importance that reflected the relative power of its evidence. I invented what I call Publication Voting Power (PVP). It is a simple numerical value given to each publication type. I started this power by the arbitrary number 0.5 which I gave to the case study and increased it by 0.5 as I went up the ranks of the publication that was decided previously. Now each publication was given a PVP as shown in table (1). In the comparative studies one or more surgeons are doing more than one type of operation to the same problem without selection, randomization or control. After sometime these different procedures are compared and the one giving the best result is announced. I went back to my search question: What is the current surgical treatment of upper GIT bleeding that is evidence-based?

To make my search simple, I divided the causes of upper GIT bleeding into two main problems; portal hypertension and peptic ulcer disease, excluding other ones. I looked into the method section of the publications to know the operations that were being done for these two main causes. These were written in the order that I found them in the search as shown in table (2) for portal hypertension and table (3) for peptic ulcer disease.

Table (2) Final Vote for portal hypertension operations

Operation	Vote	Sum of the votes
Transmural ligation + fundoplication	0.5	0.5
Oesophageal transaction	1 + 0.5	1.5
Portocaval Shunt	3+1	4.0
Distal Spleeno-renal Shunt **	1+1+ o.5 + 0.5+1+ 1+2 +1+0.5	8.0
H- Graft (meso and portocaval).	1.5	1.5
pericardial devascularization + proximal splenorenal shunt	2.5	2.5
TransmuralVariceal ligation and fundoplication.	0.5	0.5

** This is the winner.

Table (3) Final Vote for operations for peptic ulcer disease.

Operation	Vote	Sum of the votes
Partial Gastrectomy *	2.5+0.5+0.5+ 0.5	4.0
Undersewing + vagotomy + Drain	0.5+ 0.5+ 2.5	3.5
Undersewing Alone	0.5	0.5
Vagotomy + Antrectomy **	0	0.0

* This is the winner. ** Mentioned but no one preferred it.

To know the preferred operation for each publication, I read the conclusion. For each publication type I gave it's voting power to it's preferred operation.

Results

When all the publication voting powers were included, the votes were counted and a sum was written opposite each operation. This was done for both portal hypertension and peptic ulcer disease. The operation with the highest vote meant that the best evidence supported it. The results are shown in tables (2) and (3) respectively

Discussion

Randomized controlled, double blind trials in surgery are neither feasible nor ethical in most of the conditions. Most of the evidence is found in case series or sought through direct consultation of an experienced surgeon. Systematic review, like meta-analysis, is the best way to obtain accurately weighted evidence. Narrative reviews are also good as an alternative. But these have to be ready for a busy clinician to pick up, and for most surgical conditions they are not available. Other research types should not be discarded, as valuable evidence is sometimes found in less valued research and in many instances it is the only source of evidence available.

The way to find the relevant publications in the vast ocean of data should be made simpler and straightforward. The Internet search engines are becoming more and more accurate and quick, but still a lot of irrelevant information is catched by whatever method one uses, which makes sorting out the data more time-consuming. Also a lot of relevant publications may not be catched in spite of using the Mesh terms. To get the best of publications, one should search the following areas systematically: Pubmed, Cochrane, HINARE, and Free medical journals.

For a busy clinician, an alternative way to weigh the evidence should be accepted even in the face of a less accurate method. This, surely, is better than having nothing when there is no time for taking the long hard way. The main problem is to determine the value of published research. Not all the criteria that define a good research are obtainable globally. In developing countries optimal conditions to do a research are difficult to get and research is done in less than that. Even in developed countries researches vary in their methods and the value of some are questioned. The methods of measuring the strength of evidence should be made clear and simple for use. If the publishers decide the level of evidence for every publication and include it at the end of the article, as is done by the Journal of Bone and Joint Surgery[2], then putting the evidence in it's accurate hierarchal position in the method described here will be easier and more reliable. If the level of evidence is not given, then a simple way to determine it`s level is as follows:

The research types given in this article are meant to be examples to explain the method and may not be comprehensive. If one finds more types of publications, or detailed subdivision to the publications[1,2], then one should arrange them in an ascending order of importance and start by the power 0.5 and adds 0.5 to each following level. The more publications one find, the more will be the accuracy of the method.

This method can be used in fields other than surgery. In finding evidence supporting a drug, a diagnostic test or an investigation one can use the voting power in the same way.

Testing this Method:

The accuracy and reliability of this method can be tested by comparing it to the end result of a published meta-analysis. The component publications of a meta-analysis could be assigned voting powers and the best procedure is determined by calculating the final vote. The result is then compared to the result reached by the meta-analysis.

A published meta-analysis[8] is chosen to make the above test. It has the following objective: (To review randomised controlled trials of treatment with a proton pump inhibitor in patients with bleeding ulcer and determine the impact on mortality, rebleeding, and surgical intervention). It analysis 21 published randomized controlled trials. Seventeen of these were retrieved, but the other four could not be retrieved using different search strategies. The ones which were not found were the references numbers 16, 31, 32 and 33 in the original article in reference 8. As all the publications were randomized controlled trials, each one was assigned 0.5. The impact on outcome is; decreased mortality, decreased or no rebleeding and decreased or no surgical intervention. 0.5 was given to each outcome when improvement was found by the study. If there were improvements in more than one outcome, each would be given 0.5. The publications in which no improvement was found in any outcome meant that their voting power is zero for all. These are the references number 13, 14, 15, 17, 18, 22 and 23 in the original article in reference 8 . The final vote is shone in table (4). The comment from this final vote is that; proton pump inhibitor did not have an effect on mortality

but it had decreased the rebleeding and to a lesser extent decreases surgical intervention. The comment in the original meta-analysis was (In summary, proton pump inhibitor treatment does not reduce mortality after ulcer bleeding, though it does reduce rates of rebleeding and, in general, the need for surgical intervention)[8]. The comments are identical.

Table (4) Final Vote for the impact of use of proton pump inhibitor on outcome in bleeding peptic ulcer.

Outcome	*PVP*	*Sum*
Mortality	*None*	*0.0*
Rebleeding	9 × 0.5	4.5
Surgical intervention	4 × 0.5	2.0

To summarize the steps;

1- Know how to search the net and do it.
2- Write down the publication types that you find.
3- Give each publication a voting power. Use mine.
4- Find all the procedures that are done to solve the problem.
5- Give the voting power of each publication to it's preferred procedure.
6- Sum up the votes and announce the winner

Conclusion:

This method is not a replacement to systematic reviews that use statistical analysis, like meta-analysis, as the latter is included in the former. It is a simple method to get an evidence-based support to a procedure using a short way. It depends on putting the publications in a hierarchal order and assigning a power (called here Publication Voting Power) to each decreases surgical intervention. The comment in the original meta-analysis was (In summary, proton pump inhibitor treatment does not reduce mortality after ulcer bleeding, though it does reduce rates of rebleeding and, in general, the need for surgical intervention)[8]. The comments are identical.

The best procedure is then decided by simply adding the powers of the publications in which the procedure is preferred

Recommendations

- It is recommended that publishers determine the level of evidence for each publication and write it at the end of the full publication and abstract.
- Researchers are invited to test this method and compare it to standard methods taking into account the benefits of its simplicity

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Serum calcium level as a marker of pregnancy-induced hypertension

Abdelmarouf H. Mohieldein[1], Asma A. Dokem[2], Yousif H M. Osman[3], Hamza M. A Idris[4]

Abstract:

Background: Regulation of intracellular calcium plays a key role in hypertension. Hypertension has been estimated to complicate 5% of all pregnancies and 11% of first pregnancies. Half of the pregnant women with hypertension have pre-eclampsia. Hypertensive disorders account for up to 40 000 maternal deaths annually.

Objective: To compare total serum calcium levels in pregnant women complicated with pre-eclampsia with those in normotensive control.

Patients and Methods: This is a case-control hospital based study carried out at Omdurman Maternity Hospital, Khartoum Teaching Hospital, and Khartoum North Teaching Hospital in Khartoum State, Sudan in the period from October 2006 to June 2007. One hundred thirty-five women were enrolled in this study. 90 women with pregnancy - induced hypertension (PIH) admitted after 20th week of pregnancy represented the study group. Forty five women with normal pregnancy, at same age; same gestational age were selected as control group.

Results: The mean (±SD) serum calcium of the study group was 8.38±1.04 mg/dl, while that of the control group was 9.04±1.13mg/dl (P= 0.001).

Conclusion: Low level of maternal total calcium may have a role in the development PIH. Therefore calcium consumption in pregnancy should be encouraged. Calcium supplement is recommended for women who live in places of low socioeconomic status as well as for women who prefer to skip milk and milk products due to personal preference.

Key words: calcium, pre-eclampsia, calcium supplementation, pregnancy.

Introduction

The pregnant woman's body provides daily doses of 50 to 330 mg calcium to support the developing fetal skeleton[1]. This high fetal demand for calcium is facilitated by profound physiological interactions between mother and fetus[2]. Early studies of blood calcium levels during pregnancy in humans found a significant decrease in the total serum calcium as pregnancy progressed[3].

Regulation of intracellular calcium plays a key role in hypertension[4]. Hypertension has been estimated to complicate 5% of all pregnancies and 11% of first pregnancies. Half of the pregnant women with hypertension have pre-eclampsia. Hypertensive disorders account for up to 40 000 maternal deaths annually[5]. Pregnant women who develop severe pre-eclampsia have significant lower dietary calcium intake when compared to normotensive women[6]. Moreover, Calcium supplement has been hypothesized to reduce chances of pregnancy-induced hypertension (PIH) and pre-eclampsia[7,8].

One of the United Nations' Millennium Developent Goals for 2015 is to reduce the maternal mortality ratio by three-quarters[9]. Ninety-nine percent of maternal deaths occur in developing countries[10], and the World Health Organization encourages investigations in these settings to determine the risk factors of maternal deaths. The maternal mortality ratio was 47.3 per 100,000 live births. The main causes of death were hemorrhage (30.9%), pre-eclampsia/ eclampsia (28.2%), and septic shock (10.9%) [11].

PIH is a common condition in Sudanese pregnant women as observed by practicing doctors, although to our knowledge there is no published data of its prevalence in Sudan.

Objective

The objective of this study was to compare the total serum calcium levels in pregnant women complicated with pre-eclampsia with those in normal pregnant women.

Subjects and Methods

This is a case-control hospital based study carried out at Omdurman Maternity Hospital, Khartoum Teaching Hospital, and Khartoum North Teaching Hospital in Khartoum State, Sudan in the period from October 2006 to June 2007.

One hundred thirty-five women were enrolled in this study. Ninety women with pregnancy - induced hypertension admitted after 20th week of pregnancy represented the study group. 45 women with normal pregnancy, at same age; same gestational age were selected as the control group.

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Collection of blood samples

Three ml blood samples were drawn without use of tourniquet from forearm veins of the selected pregnant women. The collected blood was allowed to clot spontaneously in a container, followed by centrifugation at 60 rpm for 2 minutes.

Procedure for measuring serum calcium

Serum calcium measurement was performed with enzymatic method[12] using automated spectrophotometer (Biosystems 30, Spain).

Data collection

Pregnant women completed pre-coded questionnaires after formal consent. The questionnaires included personal information (age, number of pregnancies, level of education, calcium sources in diet).

Statistical Data processing

Data were fed to Statistical Package for Social sciences (SPSS). For differences in level of serum calcium t- test was performed. Level of statistical significance was set at P value < 0.05.

Results

1. Age at participants:

The mean age of women in the study group was 27.4±6.1 years; while that in the control group was 24.4±6.6 years (figure 1 and 2).

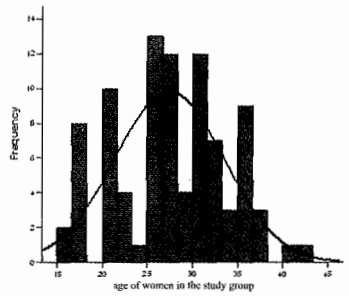

Fig 1. Histogram represented age of women in study group (mean 27.4±6.1 years)

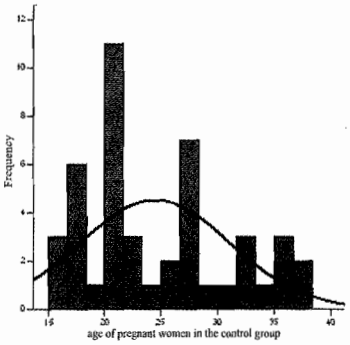

Fig 2. Histogram represented age of women in the control group (24.4±6.6 years).

2. Distribution of residence for pregnant women in study group:

All the pregnant women in the study group live in low socioeconomic areas in Khartoum state (figure 3).

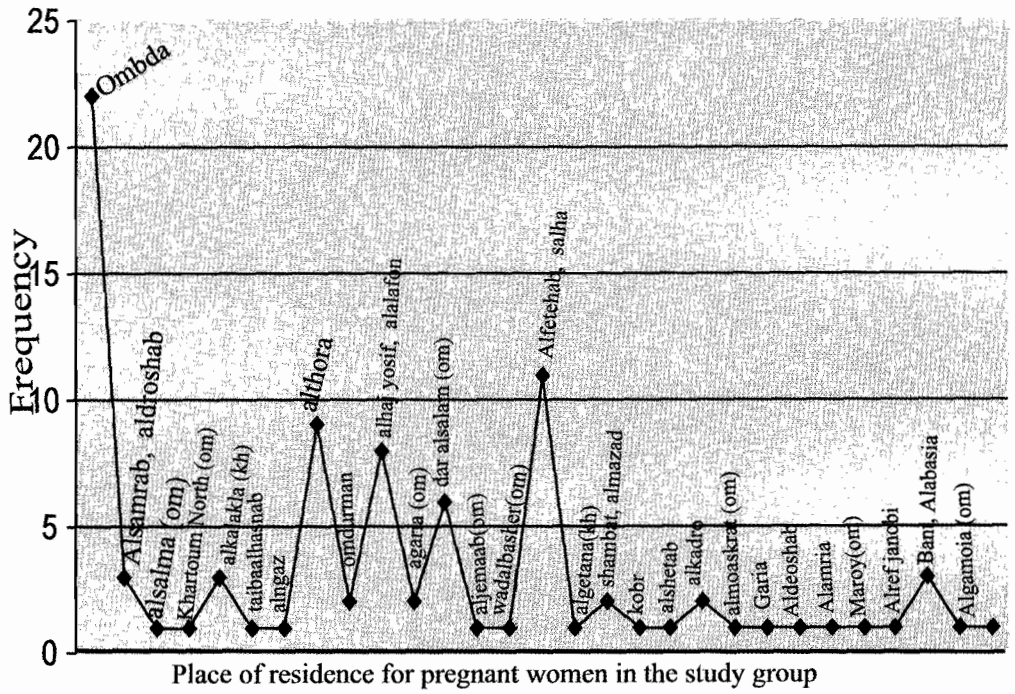

Fig 3. Distribution of residence for pregnant women in study group.

3.level of serum calcium:

The mean serum calcium of the study group was (8.38±1.04 mg %), while the mean serum calcium of the control group was (9.04±1.13mg %). There was a statistically significance difference between the two groups P= 0.001,

4. Drinking milk/having dairy products for the study group participants:

Sixty three (70%) in the study group used to drink milk about one liters /week; while 27(30%) don't drink milk at all. Moreover, 64(60%) of women in study group have dairy products namely cheese (quarter kilogram/week) and yoghurt (approximately one litre /week). Despite this data, the mean serum calcium was low compared to normotensive control.

5. Having calcium tab supplementation for the study group participants

We observed that 83 (92.22%) of the pregnant women with pregnancy-induced hypertension had never had calcium tab supplement.

Discussion

Pre-eclampsia; occurs in about 5 % to 10% of all pregnancies. Usually, there are three primary characteristics of this condition, including pregnancy-induced hypertension (PIH), protein in the urine, and oedema[13]. The exact cause of PIH has not been determined. There are many theories, but all that is known for sure is that its mediator originates in the placenta and is believed to be a woman's immunological "reaction" to the fetus and placenta[14,15].

Calcium is an important component in balanced diet. It is essential for the normal growth and maintenance of bones and teeth, and calcium requirements must be met throughout life[16].

During full-term pregnancy, the fetus takes approximately 30 g from the mother's calcium, at the expense of the mother's bones if calcium intake is insufficient. In addition, women who consume more calcium during pregnancy may have higher levels of calcium in their breast milk and babies born to women with higher calcium intake may have better bone mineralization and lower blood pressure in later life[17].

Our study has shown that the mean serum calcium of the study group was (8.38±1.04 mg/dl), while the mean serum calcium of the control group was (9.04±1.13mg/dl). There was a statistically significance difference between the two groups P= 0.001. This result matches previous data from epidemiological studies which suggests that an inverse relationship between calcium and incidence of pregnancy induced hypertension[18,19]. Our result is not in keeping with that of Trumbo PR et al[20] who reported that the relationship between calcium and risk of pregnancy-induced hypertension and preeclampsia is highly unlikely, inconsistent and inconclusive.

Socioeconomic status may be correlated with calcium intake. Low -income women of reproductive age were more likely to have less than the recommended dietary allowance for calcium. As seen in figure 3, all pregnant women with pregnancy-induced hypertension in this study live in places of low socioeconomic status. 70% of them use to take less than 250 ml milk/day and 60% had dairy products, but were complicated with hypertension.

The effects of dietary calcium on blood pressure regulation appear to be paradoxical, as increasing intracellular calcium increases vascular smooth muscle tone, peripheral vascular resistance, and blood pressure, while increasing dietary calcium exerts the opposite effect. The protective effect of calcium on blood pressure can be explained in part by the influence of calcitrophic hormones on intracellular calcium. 1, 25-dihydroxyvitamin D stimulates calcium influx in a variety of cells, including vascular smooth muscle cells. This effect is rapid, as it is mediated by vitamin D receptor rather than via a classical nuclear-receptor-mediated mechanism. As a consequence, 1,25-dihydroxyvitamin D exerts a repressor effect, serving to promote contraction and increase peripheral vascular resistance. Consequently, low calcium diets, which elicit a 1, 25-dihydroxyvitamin D response, would be expected to increase blood pressure, whereas high calcium diets, by virtue of suppressing 1,25-dihydroxyvitamin D levels, would be expected to reduce vascular smooth muscle cell intracellular calcium, peripheral vascular resistance and blood pressure[4].

Conclusion

Our study suggests that the low level of maternal total calcium may have a role in the development PIH. Therefore, calcium consumption in pregnancy should be encouraged, especially during the second and third trimester of pregnancy. The calcium supplement is recommended for women who live in places of low socioeconomic status as well as for women who prefer to skip milk and milk products due to personal preference.

Acknowledgement

We are grateful to the nursing staff and the labour ward of the Maternity Block at Omdurman Maternity Hospital, Khartoum Teaching Hospital, and Khartoum North Teaching Hospital in Khartoum State for their contribution in the data collection.

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Single lobe disease in endemic goitre

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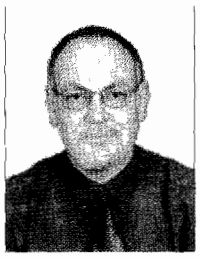

Abstract

Objectives: To describe the clinical, volumetric and cytological features of the contra lateral lobe in a series of patients with long standing unilateral endemic goitre.

Patients and methods: This study included 60 patients from the west of Sudan with clinically detectable and long standing unilateral simple endemic goitre that required surgery, with the simultaneous exploration of the contra lateral lobe.

Results: Out of 60 patients with unilateral goitre, 50 (83%) were found to have the disease on the ipsilateral lobe only (monolobar goitre).The contra lateral lobe in these 50 patients showed normal size with nodularity. 20 patients with monolobar disease had intra-operative fine needle aspiration cytology (FNAC), of which 16 patients showed normal thyroid tissue. All patients with monolobar disease had lobectomy. Post-operatively they continued to have normal blood levels of T3, T4 and TSH.

Conclusion: We report a series of patients with endemic goitre who had advanced forms of the disease that affect only one lobe in the presence of a structurally and functionally normal contra lateral lobe.

Keywords: endemic goitre, unilateral goitre, monolobar goiter.

Introduction

Endemic goitre is a very common thyroid disorder in Sudan. The prevalence of this disease may reach 86% in some regions of the west[1]. The usual presentation of this disease is bilateral involvement of the two lobes of the thyroid gland, often in an asymmetrical pattern[2]. In our hospital, we have noticed that some patients from endemic goitre areas in the west of Sudan to present with unilateral simple goitre that needed surgery and later on proved to express the disease on the ipsilateral lobe only (Figure 1a-c) .The contra lateral lobe in these patients was found to be disease-free. This is in contrast to the bilateral nodularity that characterizes endemic goitre (Figure1 d).

Our search in the literature had revealed deficiency both in the description of such an unusual type of endemic goitre and the possible causes underlying its development. The primary aim of our study is to describe a series of cases with this unusual form of the disease based on clinical, operative and cytological findings.

Patients and Methods

This is a hospital based study done during the period 2003-2007 in the University Charity and Teaching Hospital, Khartoum Sudan. The study included 60 patients from endemic goitre areas who presented with a long standing (6 years on average) unilateral goitre that required surgery, either because of compression symptoms or the presence of a significant cosmetic deformity (figure1).

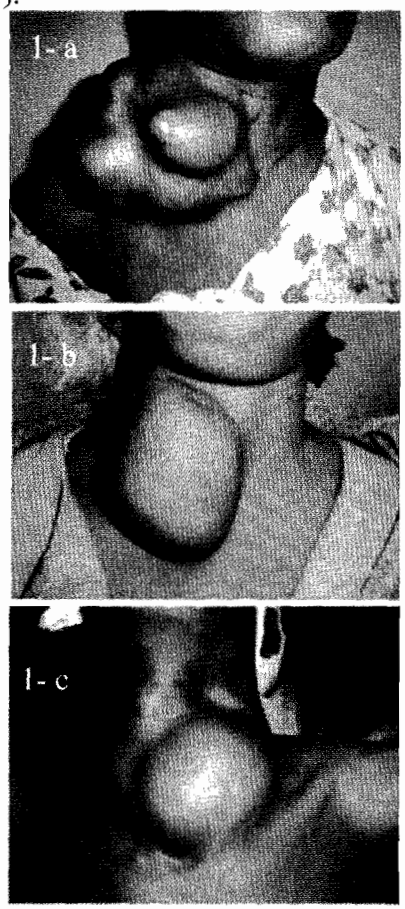

Fig 1: Pre-operative photograph of a patient with one-sided monolobar multinodular goiter causing tracheal compression

Clinical examination of the neck showed that the goitre was on one side of the midline. No swelling was detected neither by inspection nor by palpation on the contra lateral side (Goitre grade 0

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by WHO classification system)[3]. The medial border of the goitre together with the medial border of the sternocliedomastoid muscle on the opposite side and the level of the thyroid cartilage above were found to form an empty triangular space which we called **the empty triangle sign,** a term which we was introduced to indicate the absence of goitre on the contra lateral lobe (figure 2).

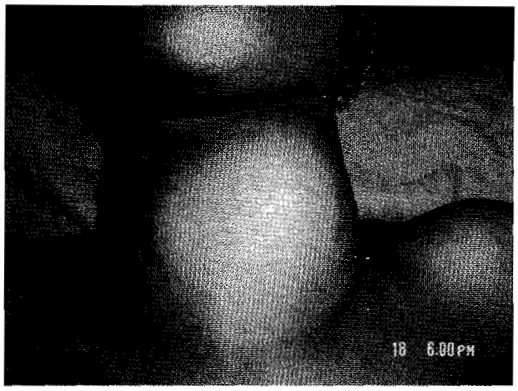

Fig 2: The empty triangle sign

Demographic data including age, sex, tribe, and residence, as well as the duration of goitre, symptoms indicative of hypo or hyperthyroidism, compressive symptoms, and previous treatment for the thyroid disease. The function of the gland was assessed with serum T3, T4 and TSH.

The surgical procedure carried out for the affected lobe was lobectomy. Regarding the contra lateral lobe, the plane between its anterior surface and the strap muscles was entered, the pretracheal fascia overlying its surface was carefully dissected, and the lobe was then mobilized and examined for nodularity. If the contra lateral lobe was initially found to be normal in the general appearance and texture, then its three linear dimensions were measured in millimeters using a rular (figure 3).

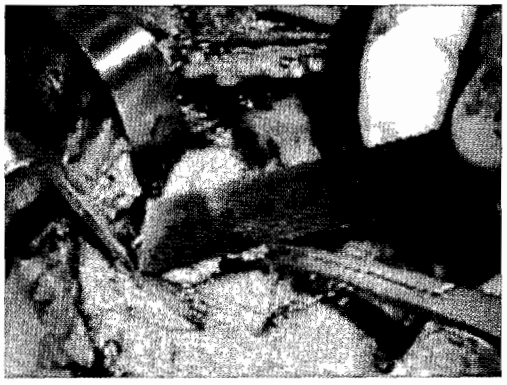

Fig 3: Measurement of the normal lobe

Patients whose contra lateral lobes were found to be nodular- regardless of their volumes or to show the mildest degrees of enlargement as compared to reference volumes were considered to have bilateral disease. For more accurate assessment of the contra lateral lobe, intraoperative fine needle aspiration [FNA] for cytology was performed. This was done on 20 patients whose contra lateral lobes were macroscopically normal. The test was done by repeated passages through the glandular tissue using a 24 gauge needle. The aspirate was spread on a glass slide, fixed with alcohol and sent for cytology.

The volume of each lobe was calculated in milliliters using an ellipsoid formula as follows:

Volume = c (CC x LM x AP)

Where CC is the craniocaudal dimension, LM is the lateromedial dimension and AP is the anteroposterior dimension. C represents a constant which equals 0.52 (or pi/6). The lobe volumes obtained were analyzed using the SPSS version 10.

The above formula which calculates the thyroid lobe volume from its ultrasonically measured three dimensions was found by many investigators to give volumes correlating well with the actual lobe volume and, therefore, was adopted in our calculations[4]. All resected lobes were subjected for histopathological examination. Serum T3, T4 and TSH levels were measured postoperatively at 3 months intervals for a period of 12 months.

Results

Out of the 60 patients 57 were females (F: M = 19:1), with an average age of 40 years (range 20-86). The mean duration of the goitre was 6 years. All patients studied were clinically euthyroid and their thyroid function tests were within the normal limits. 60% of patients had surgery because of the presence of pressure symptoms (tracheal compression), 27% because of the presence of significant cosmetic deformities and 13% because of both symptoms.

Out of 60 patients with unilateral goitres, 50(83%) patients had multinodular goitre that is confined to the enlarged lobe only (monolobar goitre). The remaining 10 patients did not meet the criteria of monolobar affection because 8(13%) patients had bilateral disease and 2(4%) patients to have huge benign adenoma.

Of the 20 patients who had FNA, 16 showed uniform follicular cells and colloid background consistent with normal thyroid tissue, two aspirates were unsatisfactory, one aspirate

showed abundant colloid with scanty follicular cells consistent with colloidal goiter and one aspirate showed degenerative follicular cells with haemosidren deposition consistent with a cystic lesion. At an earlier stage of our study, we relied on contra lateral lobe volumes corresponding to those of normal subjects in endemic goitre areas (14-16.5 ml) and the absence of modularity for the diagnosis of monolobar goitre, but later on we introduced cytology for more accurate diagnosis.

The majority of patients with monolobar affection (92%) were found to have a contralateral lobe volume in the range of 4-12 ml (figure4), corresponding to a whole thyroid volume of 10-26 ml. The mean lobe volume was nine ml. There was no apparent correlation between the volumes of the contra lateral lobe, the age of the patient, his/ her sex or the duration of the goitre.

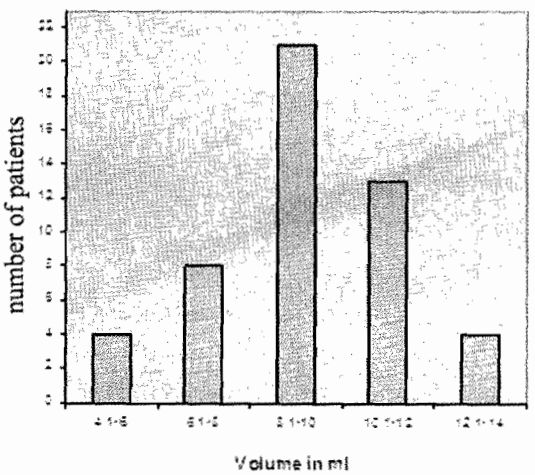

Figure 4: A graph showing the volume of the contra lateral lobe in 50 patients with monolobar goiter

An interesting intraoperative finding which was seen in the majority of patients with the monolobar disease and may indicate that the two lobes have different growth characteristics was the presence of a distinct and a well defined plane between the normal lobe and the isthmus when the later was found to be affected by the disease as well. Another important finding was the presence of a normally looking and well defined pretracheal fascia and loose aerolar tissue over the surface of these lobes. In other words, the whole contra lateral hemi thyroid compartment appeared normal.

Histopathological examination of the resected lobes had confirmed benign multinodular goitre in the 50 patients. Postoperatively all patients continued to have normal blood levels of T3,T4 and TSH, which were measured at intervals of 3 months for a duration of 12 months, indicating preserved function in the unaffected lobe.

Discussion

The female predominance in this study is in keeping with the fact that simple goitre is far more common in females[5]. Patients who were found to have small and/or solitary nodules on the contralateral lobe that do not characterize endemic multinodular goitre, for example simple cysts, were considered as patients with bilateral nodularity[6]. Multinodular endemic goitre is a multistage disease that has different clinical features corresponding to different pathological stages. In the pathophysiology of multinodular goitre, the thyroid gland first goes through a phase of global hyperplasia and then through a phase of colloid storage. Both these phases are accompanied with enlargement of the thyroid gland. Later on, active lobules form as a result of fluctuating stimulation by TSH. Hemorrhage and central necrosis will then ensue and necrotic lobules will coalesce to form nodules surrounded by scar tissue and sometimes calcification[7]. In other words nodularity develops in an already enlarged gland either because of hyperplasia or colloid accumulation as entailed by the natural history of the disease[8]. Since the disease is slowly developing and passes through different stages of enlargement with the ultimate formation of nodules, it is clear that the primary aim of FNA in our study is to pick up those cases with early stages of the disease.

Considering ethnic and geographical factors, there is a wide variation in the volume of the thyroid gland of normal subjects. Critical review of the literature has shown a range of volumes of 10-25 ml in non-endemic areas, and 30-35 ml in endemic goitre areas, corresponding to a single lobe volume of 4-11.5 ml and 14-16.5 ml respectively [9, 10, 11]. In our study, 92% of patients with monolobar goitre were found to have a contra-lateral lobe volume corresponding to that of normal subjects in non-endemic goitre areas.

Based on our findings, the confinement of the disease to one lobe only raises very interesting questions. Firstly, are there any differences in the genetic make-up of the two lobes of the thyroid gland that make the contra-lateral lobe refractory for the disease? Secondly, why should there be a delay in the appearance of the disease on the contra lateral lobe, especially that the disease has reached advanced forms on the affected side? We hope that further studies in this regard will answer these questions.

In the literature, there are some diseases reported to present in an asymmetrical pattern or to affect only one side of the body [12, 13]. The process of thyroid gland organogenesis and the molecular basis of its development are rather complex. Moreover, the genetic bases of thyroid developmental abnormalities are largely unknown, though mutations that take place in the regulatory genes are believed to be responsible for these developmental abnormalities[14].

To conclude, we describe a series of patients with endemic goitre who were found at the time of surgery to have a disease that affects only one lobe of the thyroid gland, and in the presence of structurally and functionally normal contra lateral lobe. On the face of the increasing number of patients presenting to us with this unusual form of endemic goitre, we think that it deserves further studies.

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Subcallosal Striations: the Role of FLAIR MR Imaging in Detecting these lesions in Patients with Multiple Sclerosis

Asem Al-Hiari* , Michel Kakish* , Abdelhamid Al-Odwan*, Mohammad Al-Etaiwi

Abstract

Objective: To evaluate the reliability of Fluid Attenuation Inversion Recovery (FLAIR) in detection of subcallosal striations in clinical Multiple sclerosis (MS) patients and determine its role as a good noninvasive tool for the diagnosis of this disease.

Material and Method: Forty patients with clinically proved MS were examined along with 40 control patients well matched for age who presented with other indications for MRI study. Two mm Sagittal FLAIR sequence was added to the routine MRI studies of the brain. The images were reviewed for the presence of subcallosal striations. The study was conducted at King Hussein Medical Centre, Amman-Jordan from January 2005 to July 2007.

Result: All the 40 patients with clinical MS had subcallosal striations. Of the 40 without MS only four had subcallosal striations. Subcallosal striations were highly associated ($P < .001$) with clinical MS.

Conclusions:

FLAIR is a reliable tool for detection of subcallosal striations in MS which are not seen on routine axial MR images. However, these striations later produce the ovoid lesions visible on routine MR imaging.

Keywords: Multiple sclerosis; Magnetic resonance imaging; Subcallosal Striations.

Introduction

Multiple sclerosis (MS) is an autoimmune inflammatory demyelinating disease of the central nervous system. The white matter lesions appear to be well-defined high water content lesions which involve the cerebrum, cerebellum, brain stem and spinal cord[1]. MS diagnosis is based on clinical criteria stating that patients should experience at least two attacks of neurological dysfunction, such as optic neuritis, transverse myelitis, double vision, or numbness of the leg, where signs or symptoms cannot be attributable to a single brain or nerve lesions[1-3]. MS lesions are characterized by heterogeneous pathologic features in MRI study, all resulting in increased water mobility and consequently increased T2 signal, hence T2 weighted images are traditionally used for diagnosis of MS and for monitoring its natural course and progression[1].

Pathologic studies have shown that small cortical and subcortical lesions are common in MS, although they may be under estimated on T2 weighted MR images [Fig 1], so the sagittal Fast fluid-attenuated inversion recovery (FLAIR) sequence was introduced to the routine brain MRI in an attempt to see more subtle lesions in MS patients.

FLAIR sequences produce heavily T2 weighted images with suppression of CSF signal and hence the water content lesions appear more clearly [Fig1, 2][2,4]. The sagittal plane is the optimal plane of imaging for the evaluation of MS. The two distinct advantages of sagittal imaging are direct visualization of the undersurface of the corpus callosum and decreased number of sections required to cover the brain from side to side[7].

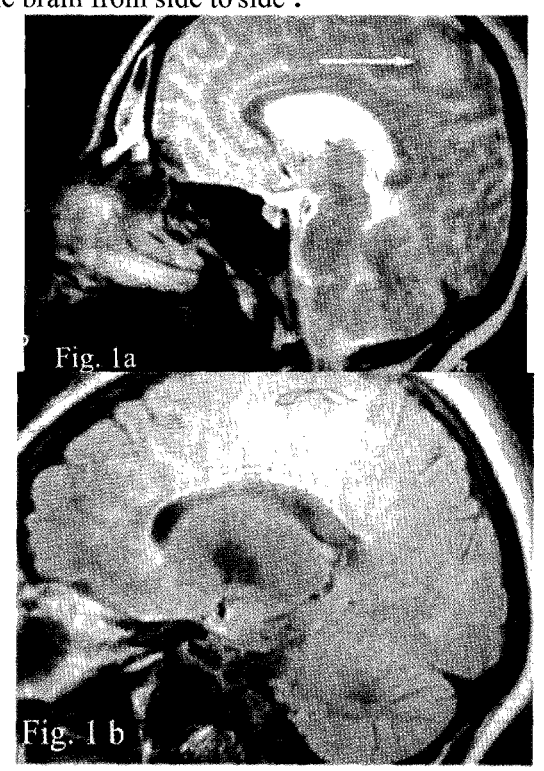

Fig 1: T2W and Fast FLAIR images obtained in 18-year-old woman with MS. **a.** The T2W images did not show the subcallosal striations, only a big MS plaque was noted (arrow). **b.** In the FLAIR images, subcallosal, linear, hyperintense lesions perpendicular to the ependyma are noted. They are most prominent in areas adjacent to the body of the lateral ventricles (arrow) the large deep white matter lesions are still noted (curved arrow).

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In our study, sagittal fast FLAIR technique was used to compare the prevalence of subcallosal striations in patients with clinical MS comparing with non MS patients.

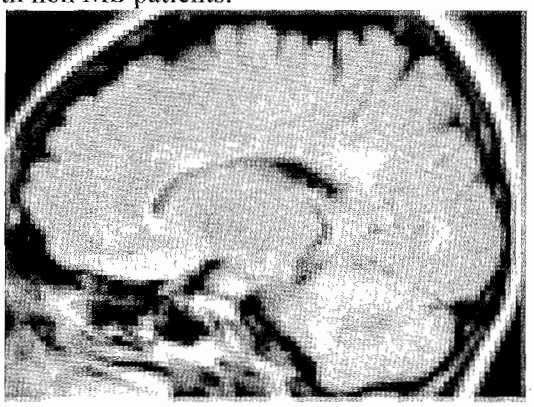

Fig 2. Fast FLAIR images in a 22-year-old woman show subtle subcallosal striations (arrow) adjacent to the body of the corpus callosum .This patient clinically had MS but had negative findings on conventional 5-mm-thick T2-weighted images

Material and method

This study was conducted at King Hussein Medical Centre, Amman-Jordan from January 2005 to July 2007. We studied 40 patients with clinically proved MS (21 women and 19 men).Their ages ranged between 16 and 60 years with a mean of 33 years. Additional 40 patients (25 women and 15 men with age group 19-68 mean 39 years) underwent MR imaging for indications other than MS.

All imaging was performed on the same scanner 3T (Trio; Siemens Medical Systems, Germany). Thin-section, sagittal, fast FLAIR imaging was added to the routine MR examinations of the brain. The routine MR imaging of the brain included: T1 weighted sagittal imaging, proton density and T2 weighted axial imaging. Potential pitfalls in the evaluation of subcallosal striations were found; including gray matter bridges that traverse the corona radiata white matter so we used only sagittal and parasagittal sections that included CSF in the lateral ventricle.

All studies were performed with a 256 x 256 matrix over a 20-cm field of view with 5-mm-thick sections and a 1-mm gap. The fast FLAIR parameters were FSE, 10,000/2,500/112 (TR msec/echo time msec/inversion time msec).

Image review was performed by two experienced radiologists who examined the hard copies side-by-side searching for the presence of lesions perpendicular to the corpus callosum (subcallosal striation).The observation was done without knowledge of age of the patients or the clinical presentation

Results

In our series of 80 patients, 40 have clinically proven MS, while the other 40 have other diseases. All the patients with MS had subcallosal striations. Of the patients without clinical MS only four (10%) had subcallosal striations with significant statistical difference between the two groups ($p < 0.001$).

Discussion

MS is a multifocal disease affecting the white matter of the central nervous system. It is diagnosed on the basis of its clinical course and presentation. It is an inflammatory autoimmune demyelinating disease that affects genetically susceptible individuals[2]. It manifests as recurrent attacks of focal neurologic disorders with a predilection for the brain, spinal cord, and optic nerves[1,7]. Tissue destruction and brain degeneration, which may be irreversible, appear to be an integral part of the MS disease process. The usual course of the attacks is to occur, remit, and re-occur randomly over many years[6,7].

Interferon β-1a is approved by Food and Drug Administration (FDA) for treatment of patients with MS. Early and accurate diagnosis of the disease is mandatory to initiate treatment in order to halt the disease progression[3].

Because of its high sensitivity and excellent gray-white matter resolution with the advantage of simultaneous imaging of spinal cord and orbits, MRI has virtually replaced all other imaging modalities including CT in the evaluation of white matter diseases[5].

There are two patterns of white matter changes which are relatively specific for MS: the ovoid lesions and the lesions on the undersurface of the corpus callosum. The finding of subcallosal striations is an earlier manifestation of the inner callosal–subcallosal and callosal–septal interface lesions. Given their perpendicular orientation to the ependymal tissue, subcallosal striations mostly represent some sort of perivenular inflammation[7,8]. Subcallosal striations are generally not visible on routine brain MRI (Sagittal T1 weighted axial proton-density weighted and Axial T2-weighted images) which reflects the great importance of the FLAIR sagittal images in MS suspected patients.

In our study the subcallosal striations were detected in the majority of MS patients (about 85%) using conventional MR imaging techniques while all the patients (100%) showed the lesions when using the FLAIR imaging [Fig 2-

5]. This data were consistent with those obtained by Marco et al[9] and Jeroen et al[10]. We noticed that the use of thin section FLAIR resulted in lowering of the partial volume averaging artifacts from unaffected normal tissues on the undersurface of the corpus callosum.

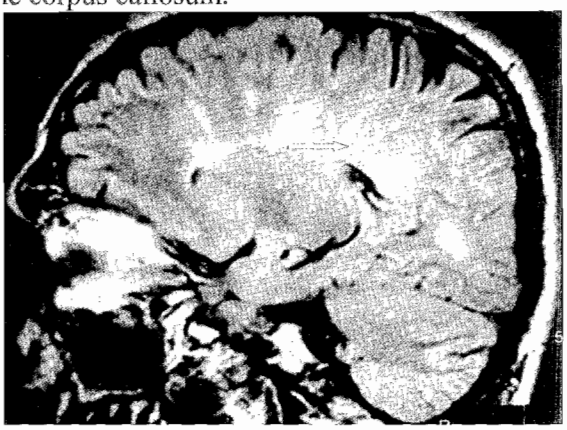

Fig 3. Fast FLAIR images obtained in a 40-year-old woman shows subcallosal striation (arrow).

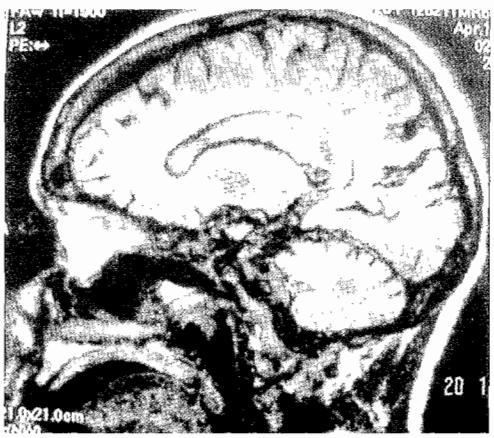

Fig 4. fast FLAIR images for a 33 years man with MS. a cluster of subcallosal striations noted around the corpus callosum.

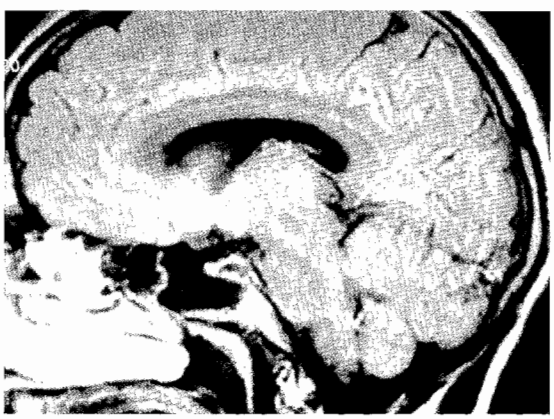

Fig 5: A fast FLAIR image for a 28 year female patient with chronic headache .the patients was investigated for MS and it was negative. The MRI did not show any evidence of subcallosal striations.

FLAIR imaging in patients with MS is not without problems! It has a relatively low sensitivity for detecting lesions in the posterior fossa and in the thoracic spinal cord. It also prolongs the examination time of the patient by 5-9 minutes.

Also the clinical overlap between early MS and acute disseminated encephalomyelitis (ADEM) may cause some difficulties in using the subcallosal striations sign as both conditions may result in perivenular demyelinating changes; it is likely that subcallosal striations might be noted in (ADEM) as well as MS[7,9].

As there may be an overlap between different varieties of demyelinating diseases, the subcallosal striations sign should not be confused with white matter ischemic changes, ependymitis granularis or gray matter bridges. In old patients with deep white matter ischemia, the gliosis found to be parallel to the ependyma rather than perpendicular to it[7]. On the other hand, in ependymitis granularis, the findings tend to be more globular and parallel to the frontal ependyma[6,7]. Gray matter bridges may be avoided by choosing the appropriate section for evaluation[7,9,11].

Conclusion

FLAIR is a sensitive way to detect subcallosal striations in MS which represent the early privenular demyelination that later progress to the ovoid lesions visible on routine MR imaging. This may have a good impact on early initiation of therapy in these patients. However, further evaluation and follow up may be necessary before the sign of subcallosal striations can be used to as definite diagnostic sign of MS

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The screening of multi-drug resistance (MDR) susceptibilities of *Staphylococcus aureus* and *Staphylococcus epidermidis* to methicillin and vancomycin in teaching hospitals in Nigeria

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Abstract

Background: In Nigeria, the widespread use of antibiotics had led to high levels of resistance among bacterial isolates from patients with nosocomial infections. This had led to prolonged hospital stay and antibiotic therapy, especially β-lactam antibiotics that predispose patients to acquisition of methicillin -resistant *Staph. aureus* (MRSA) and coagulase negative resistant staphylococci.

Objective: to evaluate the resistant pattern of multi-drug resistant strains of 80 clinical *Staph. aureus,* 22 environmental *Staph. aureus*, 30 clinical *Staph. epidermidis* and 12 environmental *Staph. epidermidis* to methicillin and vancomycin from teaching hospitals in Nigeria.

Material and Methods: The *Staphylococcus* species were identified and confirmed by gram-positive positive reaction, tested for mannitol salt fermentation and DNase production. The organisms were confirmed to be *Staph. aureus* and *Staph. epidermidis* by the tube coagulase test. The antibiotics susceptibility patterns were determined both by overnight broth-micro-dilution and agar disk diffusion methods.

Results: The isolates were resistant to ampicillin, followed by penicillin, tetracycline, erythromycin and gentamicin but to a lesser extent were sensitive to ciprofloxacin. All the multi-drug resistant (MDR) *Staphylococcus* species were 100% sensitive to vancomycin and methicillin with a minimum inhibition concentration (MIC) breakpoint $< 4\mu g/ml$ to vancomycin and MIC $< 5\mu g/ml$ to methicillin on Mueller Hinton agar supplemented with 2%NaCl.

Conclusion: The results indicated that methicillin and vancomycin are still very potent antibiotics against staphylococcal infections in Nigeria.

Key Words: MDR Staphylococcus, methicillin and vancomycin.

Introduction

In Nigeria, the widespread use of antibiotics had led to high levels of resistance among bacterial isolates from patients with nosocomial infections [19-20,15]. This had led to prolonged hospital stay and antibiotic therapy, especially β-lactam antibiotics that predispose patients to acquisition of methicillin -resistant *Staph. aureus* (MRSA) and coagulase negative resistant staphylococci. Methicillin resistant strains that emerged by late 1980s have become increasingly present as nosocomial pathogens. The medical community was again relieved when vancomycin a glycoprotein was discovered that added effective therapy to all strains of methicillin resistant *Staph. aureus*. Nevertheless vancomycin resistant strains of coagulase–negative staphylococci were also a cause of concern[16,7,14,18]. Added to these concerns were observations that vancomycin resistant enterococci isolates or epidemics in some U.S. hospitals were becoming increasingly prevalent in critical care units[5,4] and high level vancomycin resistance were experimentally transferred from Enterococcus faecalis to *Staph. aureus* in both in- vitro and in vivo- models[4,7]. Strains of *Staph. aureus* and gram negative organisms resistant to vancomycin and other antimicrobial agents including quinolones are endemic already in numerous hospitals and health care institutions leaving only a few effective and costly antimicrobials for the treatment of patients infected with these pathogens[8]. In Nigeria, there has been a recent increase in resistant to gentamicin and variable susceptibility to other non-ß-lactam antibiotics, namely tetracycline, trimethoprim, erythromycin and ciprofloxacin [1,22,24]. In this study we investigated both the broth-micro-dilution and agar disk diffusion methods on multi-drug resistant on both hospital environment and long term clinical isolates of *Staph. aureus* and *Staph. epidermidis* from some selected teaching hospitals in Nigeria to ascertain their level of resistance to methicillin and vancomycin.

Methods

Bacterial strains and selection of isolates for analysis: One hundred and forty four multi-drug resistant *Staph. aureus* and *Staph. epidermidis* from some selected teaching hospitals in Nigeria were obtained and examined for their antibiotics susceptibility profiles to methicillin and vancomycin. These isolates include 80 multi-drug resistant clinical *Staph. aureus* strains, 22 multi-drug resistant environmental *Staph. aureus* strains and 30 multi-drug resistant clinical *Staph. epidermidis* strains and 12 multi-drug resistant environmental *Staph. epidermidis* strains. The clinical isolates were obtained randomly from routine specimens from different infected sites

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(urine, wounds, and diarrheal stool) of prolonged hospitalized patients between May 2003 and October 2004. The environmental isolates were obtained from the teaching hospitals wards (air) by the suck-let sampler method. The teaching hospitals were; University of Benin Teaching Hospital (UBTH), Benin City, Edo State- Southern Region of Nigeria; Nnamdi Azikiwe Teaching Hospital (NAUTH), Nnewi, Anambra State – Eastern Region of Nigeria; Ahmadu Bello University Teaching Hospital (ABUTH), Zaria – Kaduna State – Northern Region of Nigeria and University College Hospital (UCH), Ibadan, Oyo State- Western Region of Nigeria.

Bacterial identification: All *Staph. aureus* and *Staph. epidermidis* strains were identified primarily by routine laboratory procedures [9] and confirmed to be *Staph. aureus* and *Staph. epidermidis* by gram-positive cocci morphology, catalase-positive reaction were tested for mannitol salt fermentation (Oxoid, Melbourne, Australia) and DNase production on agar plates (Oxoid CM321). Clumping factor was detected by using rabbit plasma. Organisms were confirmed to be *Staph. aureus* and *Staph. epidermidis* by the tube coagulase test

Antibiotic Sensitivity Testing: The antibiotics susceptibility patterns were determined both by overnight broth-micro-dilution and agar disk diffusion methods as recommended by Bauer et a[12] and National Committee for Clinical Laboratory Standard [17] using Oxoid- Mueller Hinton agar (Difco Laboratories, Detroit, Mich). The following antibiotics were used to screen for the resistance of the isolates; ampicillin (AM) 30µg, gentamicin (GN) 10µg, tetracycline (TE) 30µg, ciprofloxacin (CIP) 5µg, erythromycin (E) 10µg, Penicillin (PN) 30µg (Optun Laboratories Nig Ltd., Nigeria), methicillin 5µg (Bristol Meyers Squib) and vancomycin (VAN) 5µg (Mayne Pharma Warwickshire -UK). The inocula were prepared directly from an over night agar plate. Investigation of bactericidal activity were done by measuring the zone of inhibition with standard measuring procedures according to NCCLS,[17] after incubation at 30 - 350C for 24 hours. *Staphylococcus* strains that showed resistance to three or more classes of antibiotics were titled as 10 multi drug resistant (MDR), and were further preserved for other analyses. The fully sensitive strains of the organisms were discarded.

Agar Dilution tests of methicillin and vancomycin: The minimum inhibition concentration (MIC) of methicillin (MET) 500mg (Bristol Meyers Squib Hampshire- England) and vancomycin (VAN) 500mg (Mayne Pharma Warwickshire -UK) was determined by agar dilution method, according to the guidelines of NCCLS. [17] Colonies of each strain from an over night growth were transferred to sterile saline. The suspension were adjusted to a 0.5 McFarland standard, diluted 1:10, and inoculated on Mueller Hinton agar (Difco Laboratories, Detroit, Mich) plates supplemented with 2% NaCl wt/vol. The plates were incubated at 30 - 350C for 24 hours.

Results

The comparative antibiotic susceptibility profiles of the 80 multi-drug resistant clinical *Staph. aureus*, 22 multi-drug resistant environmental *Staphylococcus aureus* and 30 multi-drug resistant clinical *Staph. epidermidis* and 12 multi-drug resistant environmental *Staph. epidermidis* were shown in Tables 3a to 3d. All the MDR isolates were sensitive to methicillin and vancomycin, but were resistant to ampicillin, followed by penicillin, tetracycline, erythromycin, gentamicin and ciprofloxacin. The results showed that both isolates were highly resistant to ampicillin and penicillin from all the teaching hospitals with resistant ranged of 40% to 71%. The isolates also had a resistant range of 00% to 17% to ciprofloxacin, although environmental *Staph. epidermidis* were 00% resistant to ciprofloxacin. Only *Staph. epidermidis* from UBTH as shown in Table 1 had a resistance of 17% to ciprofloxacin. The resistance pattern varied among the gentamicin, erythromycin and tetracycline as shown in Tables 3a to 3b. The minimum inhibitory concentration (MIC) range was 0.5µg/ml to 5µg/ml with a MIC break point of < 4µg/ml for both isolates as shown in Tables 3c and 3d. All the 144 MDR *Staph. aureus* and *Staph. epidermidis* were considered to be susceptible to methicillin and vancomycin according to published NCCLS guidelines. None of the isolates had a MIC > 5µg/ml

Discussion

The 144 MDR isolates in this report were described as sensitive isolates to methicillin and vancomycin. This contradicts other reports from Nigeria and some other African countries.[1, 15]. Since all the strains were sensitive to methicillin and vancomycin, the study therefore suggested that none of the strains contained vanA or mecA genes respectively. The rate of resistance continues to reduce from the earlier reports [15], the

Table3a: Percentage (%) Occurrence of multi drug Resistant *Staphylococcus* and coagulase negative *Staphylococcus* from some selected Teaching Hospitals in Nigeria to methicillin and vancomycin from clinical sources.

Region/Isolates	Percentage resistant							
	AM	PN	TE	E	CIP	GN	MET	VAN
Southern region								
S. aureus (N=28)	57%	50%	32%	21%	07%	14%	00%	00%
S. epidermidis (N=12)	50%	67%	42%	25%	17%	17%	00%	00%
Eastern Region								
S. aureus (N=20)	40%	60%	35%	30%	10%	20%	00%	00%
S. epidermidis (N=6)	67%	50%	33%	17%	00%	17%	00%	00%
NORTHERN REGION								
S .aureus (N=14)	64%	50%	43%	21%	14%	21%	00%	00%
S. epidermidis (N=7)	71%	57%	43%	15%	00%	00%	00%	00%
WESTERN REGION								
S. aureus (N=18)	67%	39%	67%	39%	17%	17%	00%	00%
S. epidermidis (N=5)	50%	67%	33%	16%	00%	17%	00%	00%

KEY: UBTH= University of Benin teaching Hospital (Southern Region), NAUTH = Nnamdi Azikiwe UniversityTeaching Hospital (Eastern Region), ABUTH= Ahmadu Bello University Teaching Hospital (Northern Region) and UCH= University Collge Hospital (Western Region).

Table3b: Percentage (%) Occurrence of multi drug Resistant *Staphylococcus* and coagulase negative *Staphylococcus* from some selected Teaching Hospitals in Nigeria to methicillin and vancomycin from environment

Isolates	Percentage Resistant							
	AM	PN	TE	E	CIP	GN	MET	VAN
S. aureus (N=22)	68%	81%	55%	23%	09%	18%	00%	00%
S. epidermidis (N=12)	42%	58%	75%	33%	00%	17%	00%	00%

Table 3c: Minimum Inhibitory Concentration (MIC) of *Staphylococcus aureus* and *Staphylococcus epidermidis* to methicillin from some selected teaching hospitals in Nigeria

Source/Isolates		Strains for which methicillin MIC (µg/ml) was tested											
		0.5µg	1µg	2µg	3µg	4µg	5µg	6µg	8µg	10µg	12µg	14µg	
Clinical/*S. aureus*	(N=80)	1	7	55	16	2	-	-	-	-	-	-	-
Environment/*S. aureus*	(N=22)	4	12	3	3	-	-	-	-	-	-	-	-
Clinical/*S. epidermidis*	(N=30)		2	9	12	6	1	-	-	-	-	-	-
Environment/*S. epidermidis*	(N=12)	1	2	6	1	1	1	-	-	-	-	-	-

Table 3d: Minimum Inhibitory Concentration (MIC) of *Staphylococcus aureus* and *Staphylococcus epidermidis* to Vancomycin from some selected teaching hospitals in Nigeria

Source/Isolates		Strains for which methicillin MIC (µg/ml) was tested									
		0.5µg	1µg	2µg	3µg	4µg	5µg	6µg	8µg	10µg	12µg
Clinical/ *S. aureus*	(N=80)		2	10	17	34	17	-	-	-	-	-
Environment/*S. aureus*	(N=22)		-	3	1	15	3	-	-	-	-	-
Clinical/*S. epidermidis*	(N=30)		1	2	5	19	3	-	-	-	-	-
Environment/ *S. epidermidis*	(N=12)	-	1	4	6	1	-	-	-	-	-	

isolates according to the present study were all sensitive to both methicillin and vancomycin. The current studies also found that methicillin, oxacillin and vancomycin were not at all among the commonly prescribed antibiotics in teaching hospital in Nigeria[25]. However, cloxacillin with similar mode of action was very rare in circulation as compared to commonly prescribed ampicillin, penicillin, aminoglycosides and quinolones[23].

Despite the fact that a MIC = 4μg/mL was defined as susceptible by NCCLS standards[17], it is still considered to be at the borderline of resistance. S. aureus strains that are methicillin or oxacillin resistant and have a MIC of vancomycin ≥4 μg/mL should be suspected for decreased susceptibility to vancomycin and should be considered for additional testing strategies because of the possible sub-population heterogeneity of S. aureus isolates with these MIC results [6,22]. Our results indicate that methicillin and vancomycin are still very potent antibiotics against *Staph. aureus* and *Staph. epidermidis* infections. According to Jan et al[10], strains of MRSA with reduced susceptibility to vancomycin were isolated in Japan in 1997 and have since been described in the United States, France, Hong Kong, China, and Korea. Their findings as well had no strains of vancomycin intermediate *Staph. aureus* despite having three sites in Japan, consistent with the suggestion that these strains are still relatively rare. The isolation of these strains in an area of high endemicity indicates the need for continuous surveillance of antibiotic resistance of *Staphylococcus* species and the rationalization of antibiotic in clinical set up.

Conclusion

The results indicated that methicillin and vancomycin are still very potent antibiotics against *Staph. aureus* and *Staph. epidermidis* infections. Therefore the cry of methicillin-resistant ***Staph. aureus*** (MRSA) that was first identified in the United Kingdom in 1961 11 and since then assumed increasing importance internationally as a cause of both nosocomial and community-acquired infections should not be the case in Nigeria for now.

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Presentation of Colorectal Cancer in Khartoum Teaching Hospital

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Abstract

Aims: To determine the age and gender distribution in Sudanese patients with colorectal cancer, as seen in Khartoum Teaching Hospital, and to study its emergency presentation.

Patients and Methods: This retrospective study was conducted in Khartoum Teaching Hospital (Sudan). Two hundred and seventy seven (277) patients who presented in the period 1st January 2000 to 31st December 2006 were included. Data were collected from their hospital records and analyzed using SPSS computer program.

Results: More than 100(34.5%) of the study population (n=277) were below the age of 40 years, and 17.3% were below 30 years. The male to female ratio was 1.5:1. Intestinal obstruction was the most common cause of emergency presentation of colorectal cancer (94%).

Conclusion: Colorectal cancer in this study was found in young age groups. Intestinal obstruction is the main mode of its emergency presentation.

Key words: Colorectal cancer, emergency presentation.

Introduction

Colorectal cancer is one of the common cancers and is the second cause of death worldwide[1]

Hereditary factors increase the risk of development of colorectal cancer; people with positive family history in the first degree relatives have two to three folds increased risk than the general population[2]. Hereditary nonpolyposis colorectal cancer (HNPCC) which is known as Lynch syndrome, is the most common genetic disorder predisposing to colorectal cancer[3].

Colorectal cancer presents usually with rectal bleeding[2] but massive bleeding is common in benign lesions rather than malignancies[4]. Tenismus is a common presenting symptom of low rectal cancer. Emergency room presentation is having a high perioperative mortality[5].

Objectives

Our objectives were to determine the age and gender distribution of patients with colorectal cancer presented to Khartoum Teaching Hospital and to study their emergency presentation.

Patients and Methods

This is a retrospective descriptive hospital based study. It included patients who presented with colorectal cancer to Khartoum Teaching Hospital as elective or emergency in the period from 1st January 2000 to 31st December 2006. Two hundred and seventy-seven patients were included in this study. Khartoum Teaching Hospital serves Khartoum State and also accepts patients referred from different states of the country.

Demographic data of all patients were obtained with their presenting symptoms particularly those of obstruction. Also, the positive physical signs with positive relevant results of investigations were recorded.

The data were fed to and computed by the Statistical Package for social Sciences (SPSS-11).

Results

The total number of patients included in this study was 277. Patients below the age of 20 years were 4.3% and those below the age of 30 years were 17.3%. The peak frequency was 24.2% at the age group (51- 60) followed by 19.5% at the age group 61- 70 (19.5%). Males were 167(60.3%) (Fig 1)

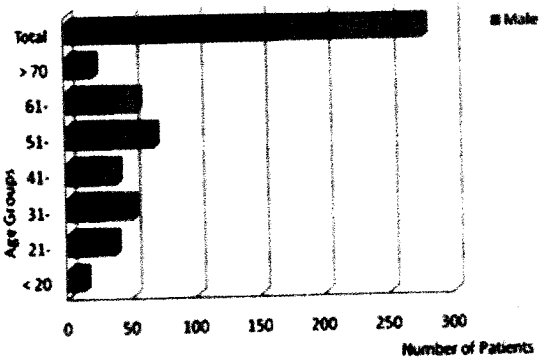

Fig 1. Age groups vs. Gender distribution in patients with colorectal cancer (n= 277).

Rectal cancer represented half of the study population followed by caecal (20%) then sigmoid cancer (14.5%). Left-sided colorectal cancer was seen in 73.6% patients (figure 2). Sixty-five percent of the patients presented as elective cases (figure 3). Out of the thirty five

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percent who presented in emergency situation 94% had intestinal obstruction

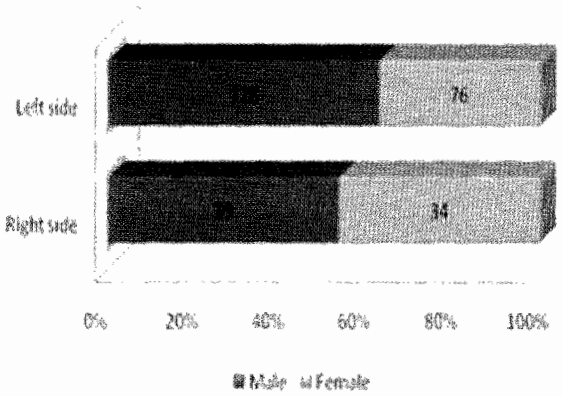

Fig 2. Site of the tumor vs. gender of patients with colorectal cancer (n=277).

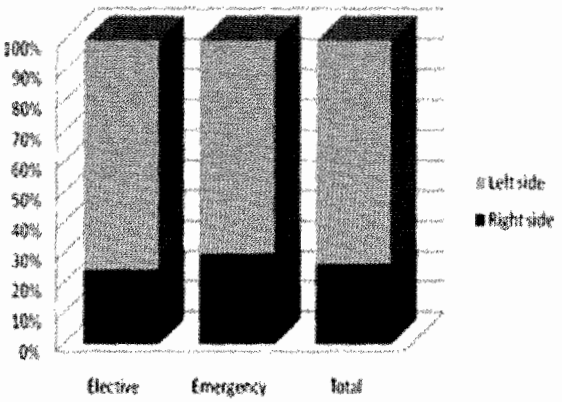

Fig 3. mode of presentation in relation to the side of colorectal cancer (n =277).

Discussion

The total number of patients was 277. In this study 17.4% of them were below the age of thirty which is similar to a study done in Soba University Hospital in Sudan in the period from July 1975 to December 1985. That study showed more than 16% of patients was below the age of 30; which reflects that, the incidence of colorectal cancer among young population is almost constant for the last three decades.

Ninety eight (35.4%) patients of our study were forty years or less, an incidence which is much higher than that mentioned in the literature[6]. Agrawal S et al recommended screening of African Americans at a younger age (45 rather than 50 years) as they were found to have a higher incidence of developing colorectal cancer at a younger age[7].

On the other hand the highest incidence was identified in the age group 51- 60 years (24.2%) which coincides with that reported by Walderon et al[5] but differ from David et al whose peak incidence was at 75 years[1].

In this study males (n=167) were more than females (n=110) a ratio of 1.5: 1 which is almost similar to that shown by others[4, 8]. On the other hand Guraya S Y & Eltinay O E showed a different male to female ratio (4: 1)[9].

In this study 204 (73.6%) patients were diagnosed as having left-sided colorectal cancer.

Keeping with literature[4], in our study the rectum was the most affected site (49.8%), followed by the caecum (20.2%) and sigmoid (14.4%). Nevertheless, a different report contrasts our findings[9].

In this study both genders showed more left-sided colorectal cancer but females had more right-sided colonic cancers than males (30.9% vs. 23.4%) and the contrary for the left-sided cancers which are more common in males (76.6% vs. 69.1%). Zbar et al reported a steady increase in both left and right-sided colonic tumours with no gender predilection[10]; our findings are in keeping with Wood S E et al findings[5].

Ninety-seven (35.0%) of our patients presented as an emergency; 92(94.8%) had acute or subacute intestinal obstruction. This percentage was higher than that shown elsewhere[1, 11,12]. This reflects that intestinal obstruction is the main emergency presentation of colorectal cancer in Sudanese patients and the first line medical providers may not be plainly frank to request rectal examination. Also, specialized surgical gastrointestinal tract service is not available in peripheral areas of the country.

Conclusions

In conclusion, colorectal cancer was found to affect Sudanese patients at younger age groups (35.4% were forty years or less) with a peak frequency at the sixth decade. Males were affected more than females and at younger age groups.

The most common emergency presentation was intestinal obstruction.

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Post Ejaculatory Effects of Sildenafil Citrate (Viagra) On Sexual Responses in Diabetic Neuropathic Men

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Abstract:

Background: Erectile dysfunctions in diabetes are important signs probably due to pelvic autonomic neuropathy with damage to the parasympathetic nervierigpetes. Direct evidence for a neuropathic etiology comes from studies that show structural changes in autonomic nerve fibers supplying the corpora cavernosa.

The present study deals with the post ejaculatory effects of sildenafil citrate (Viagra) administration on sexual dysfunctions associated with diabetic neuropathy/ erectile impotence prevailing in the male population.

Aim: To investigate whether sildenafil citrate administration maintains improved erectile functions in diabetic men with established autonomic neuropathy during post ejaculatory refractory phase (the phase of re-obtaining erection after ejaculation) after psychic and physical sexual stimulation. These findings may be of patho-physiological significance for the use of sildenafil citrate on the management of erectile dysfunctions in diabetic neuropathic men.

Methods: The study design consisted of a prospective cross-over, two period investigation (Pre and post ejaculation before and after the intake of 50 mg Viagra). Erectile/sexual functions including Libido, erection frquency, masturbation ability, pattern of ejaculation, and pattern of erection lost were noted during audiovisual sexual stimulation in 50 insulin dependent diabetes mellitus (IDDM) and in 50 non insulin dependent diabetes mellitus (NIDDM) patients with and without an objective evidence of neuropathy, having an age span in between 20 and 65 years and a duration of diabetes distributed over 1-25 years with their age matched non diabetic controls.

Results: Sildenafil treatment showed a significant improvement ($P<0.0005$ in some cases) in all the parameters during the first ejaculatory phase in both types of diabetic neuropathics and were found to be maintained (absolute) during post ejaculatory phase as well. However, this difference was found to be non significant in both types of diabetic patients without neuropathy and when compared with their respective control subjects during the first ejaculatory phase. A complete failure in the pattern of erotic responses in these subjects during the post ejaculatory phase was also observed since no erection/ejaculation could be observed during this phase.

Conclusion: These results suggest that sildenafil citrate is an effective and well-tolerated treatment for erectile/sexual dysfunction in patients with diabetic neuropathy and has a positive influence over the resumption of erections and sexual functions following post ejaculation in the presence of a continuous psycho-sexual stimulus and adds a new aspect of interest in the research area concerning the copulatory mechanism of male copulatory behaviour.

Key-Words: Diabetic neuropathy, Sildenafil citrate, Post ejaculatory sexual behavior

Introduction:

Erectile dysfunction is a common multifactorial complication of diabetes mellitus. Long term complications of diabetes mellitus include retinopathy, nephropathy and neuropathy. Direct evidence for a neuropathic etiology of diabetic erectile dysfunction comes from studies that show structural changes in autonomic nerve fibers supplying the corpora cavernosa[1]. Emission disturbances that occur in diabetes are associated with involvement of the sympathetic fibers that sub serve the seminal vesicles, vas deferens, and bladder[2]

Testicular anesthesia, presence of a neurogenic bladder, and delayed bulbocavernous reflex response latency are indirect evidence for a neuropathic etiology of the patient's complaints[3]. Failure of ejaculation secondary to emission disturbances due to sympathetic denervation of the vas deferens is another manifestation of autonomic neuropathy, usually seen in more advanced stages[4,5]. It is now established that sexual dysfunction is a common complication of diabetic autonomic neuropathy both in men and in women[6,7,8,9]. Despite the general agreement of previous investigators that the prevalence of impotence in diabetic men approximates 50 per cent, there is controversy surrounding the etiology of this problem, and the pathologic basis of diabetic autonomic neuropathy is still incompletely understood.

Numerious strategies have been tried to overcome this diabetic complication including improvin glycaemic control, drugs that influence penile rigidity, vacuum assisted devices to produce an erection-like state, operations to apply prostheses within the penis and psychological counseling.

One interesting new breakthrough in the treatment of erectile dysfunctions using oral drugs lies in the substance sildenafil citrate (*Viagra*™) seems to be a most promising discovery[10].

Sildenafil is a potent and selective inhibitor of the cyclic guanosine monophosphate (cGMP)-

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specific phosphodiesterase type 5 (PDE5), which is responsible for the degradation of cGMP in the corpus cavernosum[11,12].

Sildenafil has a peripheral site of action on erections. It potently enhances the relaxant effect of nitric oxide (NO) on this tissue. When the NO/cGMP pathway is activated, as occurs with sexual stimulation, inhibition of PDE5 by sildenafil results in increased corpus cavernosum levels of cGMP. Increased levels of cGMP are involved in smooth muscle relaxation, which in turn leads to penile erection. cGMP is converted back to guanosine monophosphate (GMP), a cGMP precursor, by the action of phosphodiesterase type 5 (PDE5). Sildenafil prevents the breakdown of cGMP thereby preventing premature detumescence. Furthermore, treatment with sildenafil is well tolerated and is associated with minimal adverse events that rarely cause discontinuation of the treatment[13].

The effectiveness of sildenafil in patients with various etiologies has been confirmed in a large fixed dose study where the 514 men had erectile dysfunction that was organic in 32%, psychogenic in 25% and mixed in 43%[14]. In a follow-up of 267 patients, there was a corellation between baseline sexual function and response to sildenafil, but even in patients with severe erectile dysfunction there is a 41% satisfaction rate[11]. There are also lower rates of satisfaction with sildenafil in patients with neurogenic cause of erectile dysfunction (diabetic neuropathy) than psychogenic or vasculogenic erectile dysfunction[15]. Recently, sildenafil has been shown to restore erections in temporary erectile dysfunction related to the need of semen collection for assisted reproductive techniques through its ability to to reduce post-ejaculatory refractory time in the presence of a continous erotic stimulus. This adds a new aspect of interest in the reseach area concerning the regulatory mechanisms of male copulatory behavior[16].

In the present investigation we have defined our main outcome measure whether sildenafil citrate's prolong ejaculatory latency and shorten refractory period is beneficial for the achievement of penile rigidity satisfactory penetration and sufficiently prolonged to enable sexual intercourse to be completed in diabetic neuropathic men.

Materials and Methods

This research was conducted in the department of physiology, faculty of Medicine, Umm-al-Qura university Makkah, during the academic year 2006-2007. Subjects were all resident of the city of Makkah and the surrounding vicinity, Saudi Arabia. For experimental purposes and for the studies of diabetic neuropathy, after getting the permission from the local ethical committee, 50 diabetic men both insulin dependent (IDDM) and non insulin dependent (NIDDM) with and without evidence of neuropathy and 50 age matched non diabetic male controls were selected. Every male aged between 20 to 65 years with duration of the onset of the disease to 1 to 25 years was included.

The presence of diabetic complications were assessed by a review of the medical record. Neuropathy was present if the records indicated absence of ankle jerk, decreased vibration sense or pin prick sensation in the feet or hands, or there was history of neuropathic pain, foot ulcer, or symptoms compatible with autonomic neuropathy (differential diagnosis) including postural hypotension, intermittent diarrhea especially nocturnally, epigastric fullness, bladder dysfunction, diminished sweating in the legs, gustatory sweating and hypoglycemic unawareness. The criteria for the presence of symptomatic autonomic neuropathy were two or more severe or three or more mild/moderate features.

Impotence was determined according to the method described previously[17]. Men were considered candidates for this study when they had complained of erectile dysfunction with diabetic neuropathy for 6 or more months. All candidates had normal results on magnetic resonance image studies of the hypothalamic pituitary axis as obtained by their medical records.

Diabetic treatment was recorded as diet alone, oral hypoglycemic agent or insulin. Inquiry was made of other drug therapy, angina pectoris, previous myocardial infarction or cardiac failure, intermittent claudication, thyroid dysfunction, previous sympathectomy or other abnormality that might predispose to organic impotence such as neurological disease or previous injury.

To assess the efficacy and safety of oral sildenafil citrate (Viagra™-Pfizer) in the treatment of erectile dysfunctions in IDDM/ NIDDM diabetic men with and without neuropathy and in age matched non diabetic controls, subjects home and clinical practice centers in the local vicinities, were randomized to receive sildenafil citrate (50 mg), but not more than once daily, for 12 months. Self-reported ability to achieve and maintain an erection for sexual intercourse according to the International Index of Erectile Function and adverse events were recorded according to the method described

previously[18]

The study design consisted of a prospective cross-over, two period investigation (Pre and Post Ejaculation after the intake of 50 mg Viagra). Erectile and sexual responses were assessed using simultaneous monitoring of Libido, Erection frequency (Angle of erection), Masturbation ability, Ejaculation pattern (Normal/Retrograde) and pattern of Erection lost (Gradual/Abrupt) during laboratory based audiovisual sexual stimulation with film before and after the sildenafil treatment in all the subjects according to the method described previously[17, 19].

The degree of erection to erotic film & fantasy distinguished between neuropathic & non neuropathic etiologies. The initial approach was tentative so that it was easy for the individuals to decline without embarrassment. If there was apparent willingness, a more definite request was made. The time to re-obtain erection after ejaculation (post ejaculatory refractory time) was measured with the stop-watch technique by asking the subject to keep self-stimulating immediately after ejaculation and concomitantly by keeping on watching a different audiovisual sexual stimulation. All the parameters were statistically analyzed using Student *t*-test. In all the instances probability ($p<0.05$) was regarded as statistically significant.

Results

The data for the assessment of libido (%), Erection frequency (Angle of erection), Masturbation ability, Ejaculation pattern (Normal/Retrograde) and pattern of Erection lost (Gradual/Abrupt) before and after the administration of the 50 mgs. of oral dose of sildenafil in 50 IDDM/ NIDDM diabetic men (with and without neuropathy) and in 50 age matched non diabetic control patients is shown in tables-1-5. Sildenafil treatment showed a significant improvement ($P<0.0005$ in some cases) in the pattern of all of the above mentioned parameters during the first ejaculatory phase in both types of diabetic neuropathics and were found to be maintained (absolute) during post-ejaculatory phase as well.

The pattern of libido in sildenafil treated IDDM/ NIDDM patients with neuropathy presented in table-1 was found to be about 100%, with a highly significant difference statistically ($P<0.0005$), when compared before the administration of viagra (almost 0%). This pattern of libido remained the same during the second ejaculation phase as well.

Erection frequency (degree) after the sildenafil treatment presented in (table-2) was found to be about 90^0, and maintained at the same level in the post ejaculatory phase from an untreated value of 45^0 with a highly significant difference statistically ($P<0.0005$).

Sildenafil treatment showed an *absolute* (90%) masturbation ability during the pre and post ejaculatory phases in IDDM/ NIDDM patients with neuropathy (table-3, $P<0.0005$), when compared with untrated subjects i.e. *impaired* (45%).

The pattern of ejaculation (table-4) in IDDM/ NIDDM neuropathics in both the pre and post-ejaculatory samples after the oral administration of 50 mgs. of sildenafil were found to be *normal* when compared before the administration of sildenafil citrate i.e. *retrograde* (Significant differerence).

Similarly the pattern of erection lost in the IDDM/ NIDDM patients with neuropathy in both the pre and post-ejaculatory samples after the oral administration of 50 mgs. of sildenafil citrate was found to be *gradual* when compared with the pattern obtained before the administration of sildenafil i.e. *gradual* (Significant differerence).

However, the difference in the pattern of all the above mentioned sexual parameters was found to be non significant in both types of diabetic patients without neuropathy and when compared with their respective control subjects during the first ejaculatory phase. A complete failure in the pattern of all the erotic responses in these subjects during the post ejaculatory phase was also observed since no erection/ejaculation could be achieved during this phase.

Discussion

The etiology of erectile impotence associated with diabetes mellitus has been reported to be neuropathic abnormality in the male genital organ and/or vascular change in the corpora cavernosa[9]. However assessment of the neuropathic factor has been impended by the lack of an objective laboratory test.

There have been previous reports in the literature that the prevalence of impotence in diabetic men is related to the presence of autonomic neuropathy [6, 8].

Current evidence indicates that erection may involve the activation of several separate mechanisms[20]. In addition to parasympathatically mediated arterial vasodilatation, there may also be active reduction of venous drainage and the active closure of intra cavernosal arterio-venous shunts[21]. None of the established methods of

Table 1. Changes in post-ejaculatory pattern of libido before and after oral administration of Sildenafil citrate (Viagra, 50mg dose) in insulin dependent (IDDM)/ non-insulin dependent (NIDDM) diabetic males (with and without neuropathy) and in age matched non-diabetic controls.

Subjects	Post-Ejaculatory Libido Before Viagra Administration		Post-Ejaculatory Libido After Viagra Administration	
	1st Ejaculation	2nd Ejaculation	1st Ejaculation	2nd Ejaculation
Iddm/Niddm Without Neuropathy N=50	Diminished (92%)	No Ejaculation	Complete (100%)	No Ejaculation
Iddm/Niddm With Neuropathy N=50	Absent* (0%)	No Ejaculation	Complete (100%)	Complete (100%)
Non-Diabetic Controls N=50	Complete (100%)	No Ejaculation	Complete (100%)	No Ejaculation

N-represents the total number of subjects examined.
IDDM/NIDDM (with and without neuropathy; 1st and 2nd ejaculation) values are compared before and after the oral administration of Viagra for t-test.
* = P< 0.0005

Table 2. Changes in post-ejaculatory pattern of erection frequency (degree) before and after oral administration of Sildenafil citrate (Viagra, 50mg dose) in insulin dependent (IDDM)/ non-insulin dependent (NIDDM) diabetic males (with and without neuropathy) and in age matched non-diabetic controls.

Subjects	Post-ejaculatory Erection frequency Before viagra administration		Post-ejaculatory Erection frequency After viagra administration	
	1st Ejaculation	2nd ejaculation	1st Ejaculation	2nd. ejaculation
Iddm/niddm without neuropathy N=50	Partial Failure of erection (88^0)	No ejaculation	Complete erection (90^0)	No ejaculation
Iddm/niddm with neuropathy N=50	Complete failure of erection* (45^0)	No ejaculation	Complete erection* (90^0)	Complete erection (900)
Non-diabetic controls N=50	Complete erection (90^0)	No ejaculation	Complete erection (90^0)	No ejaculation

N-represents the total number of subjects examined.
IDDM/NIDDM (with and without neuropathy; 1st and 2nd ejaculation) values are compared before and after the oral administration of Viagra for t-test.
* = P< 0.0005

Table 3. Changes in post-ejaculatory pattern of masturbation ability before and after oral administration of Sildenafil citrate (Viagra, 50mg dose) in insulin dependent (IDDM)/ non-insulin dependent (NIDDM) diabetic males (with and without neuropathy) and in age matched non-diabetic controls.

Subjects	Post-ejaculatory Masturbation ability Before viagra administration		Post-ejaculatory Masturbation ability After viagra administration	
	1st Ejaculation	2nd ejaculation	1st Ejaculation	2nd ejaculation
Iddm/niddm without neuropathy N=50	Partially Absolute (90%)	No ejaculation	Completely absolute (95%)	No ejaculation
Iddm/niddm with neuropathy N=50	Completely impaired* (45%)	No ejaculation	Completely* absolute (90%)	Completely absolute (90%)
Non-diabetic controls N=50	Completely absolute (95%)	No ejaculation	Completely absolute (95%)	No ejaculation

N-represents the total number of subjects examined.
IDDM/NIDDM (with and without neuropathy; 1st and 2nd ejaculation) values are compared before and after the oral administration of Viagra for t-test.
* = P< 0.0005

Table 4.Changes in post-ejaculatory-ejaculation pattern before and after oral administration of Sildenafil citrate (Viagra, 50mg dose) in insulin dependent (IDDM)/ non-insulin dependent (NIDDM) diabetic males (with and without neuropathy) and in age matched non-diabetic controls.

Subjects	Post-ejaculatory Ejaculation pattern Before viagra administration		Post-ejaculatory Ejaculation pattern After viagra administration	
	1st Ejaculation	2nd ejaculation	1st Ejaculation	2nd ejaculation
Iddm/niddm without neuropathy N=50	Almost Normal	No ejaculation	Completely normal	No ejaculation
Iddm/niddm with neuropathy N=50	Retrograde*	No ejaculation	Completely* normal	Completely normal
Non-diabetic controls N=50	Completely normal	No ejaculation	Completely normal	No ejaculation

N-represents the total number of subjects examined.
IDDM/NIDDM (with and without neuropathy; 1st and 2nd ejaculation) values are compared before and after the oral administration of Viagra for t-test.
* = Significantly different

Table 5. Changes in post-ejaculatory pattern of erection lost before and after oral administration of Sildenafil citrate (Viagra, 50mg dose) in insulin dependent (IDDM/ non-insulin dependent (NIDDM) diabetic males (with and without neuropathy) and in age matched non-diabetic controls.

Subjects	Post-ejaculatory Erection loss pattern Before viagra administration		Post-ejaculatory Erection loss pattern After viagra administration	
	1st ejaculation	2nd ejaculation	1st Ejaculation	2nd ejaculation
Iddm/niddm without neuropathy N=50	Gradual	No ejaculation	Gradual	No ejaculation
Iddm/niddm with neuropathy N=50	Abrupt*	No ejaculation	Gradual*	Gradual
Non-diabetic controls N=50	Gradual	No ejaculation	Gradual	No ejaculation

N-represents the total number of subjects examined.
IDDM/NIDDM (with and without neuropathy; 1st and 2nd ejaculation) values are compared before and after the oral administration of Viagra for t-test.
* = Significantly different

investigating penile dysfunction is wholly satisfactory.

Penile rigidity is the most important determinant of the quality of an erection. Based on published evidence it is suggested that a penile rigidity of >70% is adequate for sexual intercourse[22]. Because sildenafil is believed to exert its beneficial effects by inhibiting the phosphodiesterase type-V enzyme and, therefore, increasing the intracellular levels of cGMP in the corporal smooth muscle, it would not be expected to produce an erectile response when used in the absence of a drive on the nitric oxide-cGMP pathway. This drive can be provided by physiological mechanisms that can be initiated by visual or other forms of sexual stimulations. As such, sildenafil may be expected to enhance relaxation of the corpus cavernosal smooth muscle, which in turn increases blood flow into the cavernosal spaces, thus leading to increased intracavernosal pressure, a key factor in producing an erect penis[23].

More recently sildenafil has been reported to be used for the treatment of temporary erectile dysfunctions with assisted reproductive technologies showing a marked reduction of post ejaculatory refractory time. These results indicate that sildenafil treatment has a positive influence over the resumption of erections following ejaculation in the presence of a continuous erotic stimulus and has the potential to facilitate multiple instances of sexual intercourse in the presence of a continuous erotic stimulation[24, 25].

This study has been therefore further designed to determine if sildenafil citrate administered orally in single doses effectively improved penile erections and restores post-ejaculatory erectile and sexual responses in both IDDM/ NIDDM diabetics with erectile dysfunctions for which there was an established neuropathic cause, and to evaluate the efficacy and safety of sildenafil citrate in such patients.

Our results indicated that the pattern of libido, erection frequency, masturbation ability, pattern of ejaculation and the pattern of erection lost as a result of psycho-sexual stimulation in IDDM/ NIDDM patients with neuropathy after the oral administration of 50 mgs. of sildenafil citrate were found to be *absolute* (100% functional), when compared before the administration of Sildenafil citrate i.e. *impaired* (failure), and were found to be maintained (absolute) during post-ejaculatory phase as well.

However this difference was found to be non-significant in both types of diabetic patients without neuropathy after oral administration of sildenafil citrate and when compared with their respective control subjects.

These observations are consistant with the presence of both a domaminergic and a serotonergic control system, which normally exert a positive and inhibitory influence over the resumption of mating following ejaculation respectively. Since dopamine and serottonin do

not utilize cGMP as a second messenger[26,27], it is unlikely that sildenafil-induced reduction of the post ejaculatory refractory time is due to an interaction with central monoaminergic control pathways.

On the other hand, sildenafil-induced reduction of the post ejaculatory interval may be explained by its relatively long plasma half life (about 4 hours) and a consequant prolonged inhibition of intracavernosal PDE5[28,29].

Our results are in consistency with the above mentioned findings and proves that sildenafil citrate is an effective fist-line therapy for erectile dysfunction in diabetic men with impotence of neuropathic etiology. These results further explains, how to manage sexual disorders as part of diabetic care, and suggests rules for viagra's prescription in diabetic neuropathic patients and may prevent both stress and frustration for these couples in case a first intercourse is not successful.

In conclusion, even if further studies are needed to evaluate the effects of chronic sildenafil treatment on fertility capacity, our results indicate that sildenafil has the ability to reduce the post ejaculatory refractory time in the presence of a continuous psycho-sexual stimulus adds a new aspect of interest in the research area concerning the regulatory mechanisms of male copulatory behaviour.

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Clinical manifestation of Laryngeal Tuberculosis

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Abstract

Background: Prevalence of laryngeal tuberculosis is rising due to the increase in risk factors like HIV/AIDS. Any part of the larynx can be affected. Diagnosis depends on high index of suspicion.

Objectives: To evaluate the clinical manifestations due to localized laryngeal tuberculosis and their association with pulmonary TB.

Patients and Methods: This is a prospective study conducted in ENT Hospital- Khartoum, Sudan from September 2004 to November 2006. All tuberculous patients with laryngeal symptoms and those diagnosed histologically to have laryngeal tuberculosis were included.

Results: Eight patients were studied; they were five males and three females, with age range between 12-70 years (mean 41 years). Strider, dysphonia and dysphagia were the main complaints. Ulcers and nodules were the main findings in all parts of the larynx.

Conclusion: Diagnosis of pulmonary tuberculosis is not mandatory for the diagnosis of laryngeal tuberculosis. Cases are picked up in routine direct laryngoscopy and biopsy for prolonged dysphonia and / or those with known pulmonary tuberculosis who developed laryngeal symptoms

Introduction

Tuberculosis is still one of the most common granulomatous diseases of the larynx. In the past, it commonly followed pulmonary tuberculosis. Among the risk factors identified are the consumption of tobacco, alcohol, malnutrition, immunodeficiency and being homeless. The most common presenting symptom is hoarseness of voice, dysphagia or odynophagia, cough, weight loss, fever and night sweating. Laryngeal involvement affects the posterior portion of the true vocal cords, the arytenoid cartilages, and the intraarytenoid space. However, in the past 20 years, this pattern of involvement has changed, and most patients with laryngeal tuberculosis nowadays present without history of pulmonary tuberculosis[1-4]. A nodular, exophytic lesion or an area of mucosal ulceration, which can both be mistaken for carcinoma, perichondritis, nonspecific laryngitis, oedema, psudoepetheliomatosis hyperplasia or shrinking of epiglottis is often seen.

Prompt diagnosis depends on clinical suspicion, careful medical history and history of predisposing factors, together with laryngeal and chest examination. The characteristic findings on chest radiography are apical cavitations and infiltrations.

Recently, it has been reported that laryngeal involvement is more commonly caused by hematogenous or lymphatic spread of the organism[5].

Sputum examination for acid-alcohol fast bacilli, culture of mycobacterium tuberculosis in Lowenstein-Jenesen medium, ESR and direct laryngoscopy and biopsy are mandatory to prove the diagnosis.

Management is antituberculus chemotherapy according to the WHO regimen in the country.

Objectives

- To evaluate the clinical manifestation of laryngeal tuberculosis, its laryngoscopic characteristics and to identify its relation with pulmonary tuberculosis in Sudanese patients seen in the largest ENT Hospital in Sudan.

Patients and methods

This is a prospective study carried out in ENT Khartoum Hospital in the period between September 2004 and November 2006.

All tuberculous patients with laryngeal symptoms and those who were diagnosed histologically to have laryngeal tuberculosis were included in the study. Name, age and sex together with symptoms and signs, indirect laryngoscopy findings and investigations were also included. It was also noted whether the patient was presented first to ENT or referred from other specialties. The current or past antituberculous medication, the histopathological results of the direct laryngoscopy biopsies were also included.

Results

Eight patients were confirmed to suffer of laryngeal tuberculosis in this study. Five males and three females, Age ranged between 12 and 70 years (mean age 41 years).

Age distribution: 0-20 years was one (12.5%), 21 – 30 years were two (25.5%), 31- 50years also two (25.5%), and more than 50 years were three (37.5%) patients.

The main complaints were: Stridor in four (50%), dysphonia in all (100%). Dysphagia and odynophagia in four (50%) patients. Throat pain in two(25%), otalgia in two(25%) , fever in five (65.5%) and weight loss in two(25%) patients but no cervical lymphadenopathy was detected in any patients.

Indirect laryngoscopy findings and the involved sites: True vocal cords in Three (37.5%) patients. False vocal cords involvement in two (25%), epiglottis in three (37.5%), aryepigolotic folds in two (25%) and the posterior commissure was involved in two (25%) patients.

Macroscopic appearance: Ulceration in one (12.5%), nodular lesion in two (25%) oedema in four(50%)and hyperemia in two(25%) patients

Referred pattern:

Four (50%) patients presented first to ENT department, and the other four were referred from chest physicians.

Investigations:

CXR: Three (37.5%) patients had apical and/or central lung cavitations

ESR: was >100mm in four (50%) patients

Sputum: was positive for acid alcohol fast bacilli in four (50%) patients.

Biopsy: Histopathologic examination of biopsied tissue reveals tubercles consisting of a homogenous caseous center, a periphery of pale epithelial cells containing one or more Langhan giant cells, and an outer zone of lymphocytes was positive in all (100%) patients.

Discussion:

Although laryngeal tuberculosis is not frequent, it still occurs with an increasing incidence of pulmonary tuberculosis. In this study gender distribution is in agreement with others[6]. Children are exceptionally affected (one patient) indicating the rarity of the disease in children that goes with the fact that only 6 cases were reported worldwide during 1960-1995[7].

In the past the main presenting symptoms were constitutional symptoms such as fever, night sweats and weight loss, but in this study the fever presented in five(65.5%), loss of weight in two(25%) patients and no patient complained of night sweating.

Also in the past the interarytenoid region was the commonest site affected in nodular and ulcerative type, in our study the true vocal cords are the commonest affected site but the macroscopic finding is of generalized edema with irregular edges resembling mostly non specific inflammatory conditions. The posterior commissure involvement was found in only two (25%) cases.

None of the patients presented with cervical lymphadenopathy. Only four (50%) patients have active pulmonary TB which will support the current concept that haematogenous and lymphatic spread. Positive Mantoux and sputum were found in only 50.0% of patients suggesting that these are not mandatory to confirm the diagnosis.

Two of our patients had severe stridor that necessitated tracheostomy. 50.0% of our patients had no symptoms or signs related to pulmonary tuberculosis and diagnosis was made up following direct laryngoscpy and biopsy for routine prolonged dysphonia. None of our patients who had been biopsied had a concurrent malignancy.

Conclusion and Recommendation

Advanced cavitatory pulmonary tuberculosis does not seem to be common in our patients. Thus painful dysphagia in patients presenting with hoarseness should raise the suspicion of tuberculosis. We must remain faithful to the golden rule that every patient with prolonged dysphonia should be scoped and biopsied. Nodular or ulcerative lesions of the posterior commissure are no longer mandatory to diagnose tuberculus laryngitis which does not necessarily follow primary pulmonary tuberculosis.

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Review Article: Coronary Revascularization

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Abstract:

Coronary revascularization with prospects to improve both quality and duration of life is rapidly expanding and one of the most frequently used procedures in modern medical practice. Coronary artery by pass graft (CABG) is the most rewarding procedure for high risk patients with stable coronary syndrome (those with significant left main coronary artery disease (LMCA), LV dysfunction, three vessel disease (3VD) and those with proximal lesions of the left anterior descending artery (LAD) with percutaneous coronary intervention (PCI) using drug eluting stent [DES] as an alternative procedure. The current SYNRAX study is comparing CABG and DES in such groups of patients.

PCI is a life saving procedure in patients with acute ST elevation myocardial infarction (STEMI).

In other subsets of patients both procedures may be equally effective to improve the patient's symptoms, with PCI being less invasive and readily available.

There is a recent interest in hybrid procedures in multi vessel disease with minimally invasive surgery for the LAD and PCI for other lesions.

The rapid developments in PCI, CABG and adjuvant medications make any recommendations and guidelines on the move and alert the practicing clinicians to maintain a breast of current literature and to perceive the change.

Key words: Coronary artery bypass graft (CABG), percutaneous coronary intervention (PCI)

Historic Background

The methods currently involved in coronary revascularization are coronary bypass grafting surgery and catheter based modalities. The first selective coronary angiography was done by Sones in 1959[1]. Pre-shaped selective right and left coronary catheter was introduced in 1967[2]. Coronary artery bypass graft (CABG) was first used in 1964. The use of internal mammary artery (IMA) graft was pioneered in 1967[3, 4].

After more than a decade of CABG, percutaneous coronary intervention (PCI) was first performed[5]. The advent of PCI may have blunted the growth of CABG and it out numbers CABG by a factor of 2-4[5-7].

Overview of CABG and PCI

CABG is one of the most frequently performed operations. Grafts are either arterial or venous conduits. Arterial conduit is commonly taken from the left internal mammary artery (LIMA), it appears to have immunity from hyperplasia and less liability for atherosclerosis which is usually formed in the venous conduits[6, 7]. The arterial grafts are mainly for the left coronary system preferably to the left anterior descending (LAD) or the diagonal[7] where as the venous conduits, which are commonly taken from the saphenous vein are carried out for the distal branches on the right or left coronary tree.

Renewed interest in coronary bypass grafting without cardiopulmonary bypass i.e. the off pump coronary bypass on a beating heart is gaining encouragement in order to avoid blood transfusion, economically to reduce the cost and avoid the damaging neurological effect of cardiopulmonary bypass in the elderly. It is also attractive and has encouraging preliminary results in patients with heavily calcified aorta, for multi-vessel grafting and for those with diffuse atherosclerosis[8, 9].

Recent advances include minimally invasive surgery for grafting LIMA to the LAD, e.g. minimally invasive direct coronary artery bypass [MINCAB] and totally endoscopic coronary artery bypass (TECAB)[10, 11].

PCI was initially advocated for symptomatic relief in patients with stable angina who had single vessel disease and favorable lesion morphology. The original ACC/AHA criteria had grouped the lesions as A, B and C with higher successful rates and low complications in group A (Tab 1). The original procedure was by means of balloon angioplasty (PTCA) which achieved good results in about 70% of the cases with two major problems, acute closure[due to dissection or acute thrombosis] and the late restenosis. Stents which were originally introduced as bail out procedure for acute closure following balloon angioplasty with very good results, have now become a default catheter based strategy for revascularization[12], as they also lessened the rate of repeat revascularization due to late restenosis but still in stent restenosis (ISR) (which is almost in all cases due to neo-intimal proliferation within the axial stent length) is a limiting problem for liberal usage of PCI[13]. The development of drug eluted stents (DES) had achieved more better results regarding ISR but revealed the major problem associated with stents i.e. the late in stent thrombosis (IST) (especially after the

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discontinuation of clopidogrel treatment), which is fatal in about 50% of cases. This problem is a cross road point in the use of stents and currently it is an area of intensive research, with bio tents under focus and reflects the struggle to overcome the challenges and keep PCI on the move [14, 15].

The practice of interventional cardiology has changed radically during the last 10 years with more inclination towards PCI procedures following the wide spread use of stents, the introduction of the new platelet inhibitors (GPIIb/IIIa) and the development of other devices like Rot ablator and atherectomy[16].

A real break thorough was the inclusion of ST elevation MI (STEMI), for which PCI is a life saving procedure and of proven prognostic value. It may be done as a primary (direct) angioplasty following acute myocardial infarction, where it had been found to be associated with high patency rate of the infarct related vessel compared with thrombolysis and significant reduction in total and hemorrhagic stroke, with shorter length of hospital stay and reduced cost. It may also be done as a rescue procedure for failed thrombolysis, as adjuvant therapy to thrombolysis (facilitated) or as strategy in the sub acute period (2-7days) in patients who didn't receive thrombolysis[17-19].

Summary of indication for revascularization:

Depending on the clinical data; the patient's general condition and co- morbidities, symptoms, LV dysfunction and the angiographic data; the number and type of vessels involved and the characteristics of the lesion (table 1) plus the logistics, patient preference and the local resources and experience, the following guide lines for both prognostic and symptomatic revascularization were established (table 2) [20].

1- Regardless of the severity of the symptoms, patients with significant left main CAD, patients with LV dysfunction, patients with three vessel disease and those with proximal left anterior descending artery (LAD) may benefit from revascularization from a prognostic point of view[21].
2- Symptomatic patients with single or two vessel disease despite optimal medical therapy.
3- Patients with moderate to severe ischemic symptoms who are dissatisfied with medical therapy.
4- The role of revascularization in patients whose dominant clinical picture is heart failure without severe angina is less well defined, but should be considered in patients who also have evidence of severe ischemia

The choice between PTCA and CABG:

1- Single vessel disease:

The result of the trials which compared PTCA and CABG revealed that both are highly effective in preventing symptoms, but they did not change the mortality. However, the cost in long term is high with PTCA due to a relatively higher rate of re-interventions. In spite of that, if the lesion is suitable, PCI is generally preferred over bypass surgery[22, 23].

2- Multi-vessel disease:

Many trials[24] had shown that CABG is initially associated with greater improvement in angina. Repeat revascularizations are more frequent after PTCA, although the use of stents may reduce the need for that.

Provided that the LV function is preserved with multi-vessel disease (with suitable lesions), PCI is reasonable as initial procedure.

Patients with left ventricular dysfunction and multi-vessel disease the advantage of CABG over PCI is complete revascularization.

a) In patients with borderline (mild) LV dysfunction (EF% >40-<50%) and single vessel disease PCI may provide adequate revascularization.

3- Patient with diabetes mellitus:

In ARTS trial; one year mortality in diabetics who received PCI and stenting was double of those under going CABG[25]. In general revascularization strategy for diabetic patient should be based on the number of vessel diseased, type of lesion, the caliper of the distal vessel, the presence or absences of LV dysfunction and the related technical factors.

4- The great enthusiasm in drug eluted stents had led to creeping up of PCI over CABG in complex subsets of patients e.g. patients with multi-vessel or LMCA disease. The SYNTAX trail was designed to compare the results of DES and CABG in such type of patients and had divided them into three groups, those who are eligible for both treatment options are randomized between them while patients who are eligible for only one treatment option were enrolled in the registry tracked for it. The trial is in progress but the growing up problem of in stent thrombosis may throw shades on it.
5- There is a recent interest in Hybrid procedures for multi-vessel disease involving the proximal LAD with minimally invasive surgery to graft LIMA to the LAD and PCI to other lesions.

Adjunct medications for PCI

Dual anti-platelet therapy with aspirin and clopidogrel is the default strategy for patients going for PCI (CREDO trial). Usually the patient will be already on aspirin which is recommended to continue for life while clopidogrel is initiated pre procedural (at least 2hrs with a high loading dose) but the duration of treatment is under research. Initially it was started for 3 months but with the problem of late ISR (especially with DES), it has been extended to one year which is the current policy

Unfractionated heparin (UFH) is the default drug during PCI, while glycoprotein (GPIIb/ IIIa) receptors antagonists are recommended in high risk NSTE-ACS (Tab2). Recently, Has and REPLACE-2 trials concluded that the direct thrombin inhibitor bivalirudin is as effective as the combination of heparin and GP 11b and 111a inhibitors in preventing ischaemic complications but has a lower risk for major bleeding[20,26-28].

Conclusion

The current guidelines are in favor of CABG to improve symptoms and prognosis in patients with poor prognostic markers i.e. patients with LMCA, 3VD involving proximal LAD, LV dysfunction and diabetics with PCI as an alternative while for other subtypes of patients PCI may be a reasonable initial procedure. The problem of acute closure following PCI was largely solved by the use of stents but the problems of late in stent restenosis or thrombosis are still awaiting new developments in stent technology. The surgical trends are in favor of off pump and mini invasive surgery while hybrid procedures are promising new comers..

The rapid developments in PCI and CABG, as well as adjunct medications have generated the need for large randomized clinical trails comparing the different treatment options in different subsets of patients and validating the value of the new devices and techniques and led to the integration of the medical practice, research and industry which became a leading area for evidence bases medicine [EBM] and made the revascularization issue on the move which mandate the need for regular revision and updating of these guidelines.

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Case Report: Neonatal Multiple Hepatic Haemangiomas:- A rare presentation

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Abstract

Hepatic haemangiomas are vascular malformations that rarely affect infants. They have no characteristic presentation. Clinical diagnosis is difficult and various imaging techniques may be required. Different modalities of treatment were tried but in vain. When ruptured, the out come is grave. They remain a challenge to pediatric surgeons. We are presenting our experience with one infant who presented with a ruptured hepatic haemangioma

Key words: Hepatic haemangioma, neonates

Case Report

History: A five days old neonate, outcome of normal spontaneous vaginal delivery, presented with excessive crying, vomiting and right inguino-scrotal swelling for two days associated with low grade fever and slight abdominal distention. There was no constipation, however, the mother noticed recurrent inguinal swelling since birth and a trial of manual reduction was performed at a hospital six hours prior to his presentation.

General examination: revealed a very ill, irritable, tachypnic [RR: 64/m], pale and febrile [T39c] neonate, with no jaundice or cyanosis. His pulse was 140 beats/m. Cardiovascular and Chest examination revealed no abnormalities. Abdomen was distended, tympanic, soft, with absent bowel sound, no palpable organs or masses, and normal per rectum examination.

Local examination: showed swollen, hot, tense, and tender right inguino-scrotal region with bluish discoloration of the skin over it [Fig 1]. The testicle cannot be felt separately. Fluctuation and transillumination tests were negative.

Investigations: Hb 8.8 g/dl, TWBCs: 9.800. Urine analysis, blood urea, serum creatinine, sodium and potassium were normal. Erect X-ray film of the abdomen showed moderately distended small and large bowel loops with no air fluid levels.

Diagnosis and Management: Differential diagnosis of strangulated right inguinal hernia with sepsis, haematocele and testicular torsion was made. Nasogastric tube and urethral catheter were inserted and the patient was put on IV Ringer's lactate, metronidazole, ceftrixone and preoperative oxygen mask. One pint of cross matched blood was prepared. His parents were informed and consented for emergency surgery.

Operative procedure and findings: Under well monitored general anesthesia. Through right transverse inguinal incision with good haemostasis using bipolar diathermy, the subcutaneous tissue, and spermatic cord were found black together with the anterior abdominal muscles [Fig 2].

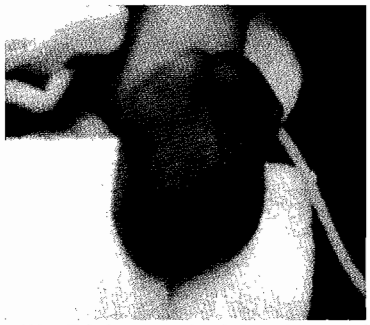

Fig. (1): Right Inguinal Region and scrotum show colour changes.

Fig.(2) Right transverse Inguinal Incision, showing Subcutaneous and spermatic cord stained bluish to black.

There was black altered blood in the right inguinal region as well as in the right scrotum. The cord was delivered out and the altered blood was evacuated. The cord was examined and process vaginalis was found to be patent It was opened and the testicle was found intact and viable.

There was a gush of altered blood from the internal inguinal ring. The right inguinal region was covered with sterile gauze and the decision of exploratory laparotomy through a right supra-umbilical transverse incision was

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made. The anterior abdominal wall and the peritoneum were found bluish. There were large clots filling the Morison`s pouch and right para-colic gutter, with a lot of altered blood [Fig 3a and b].

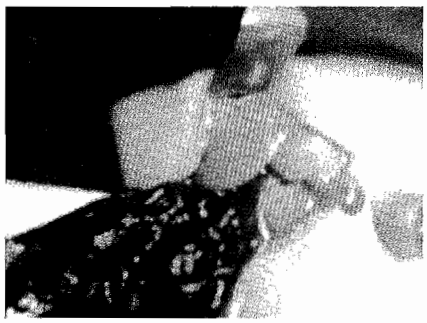

Fig. (3a) Huge Clot in Morrison's Pouch.

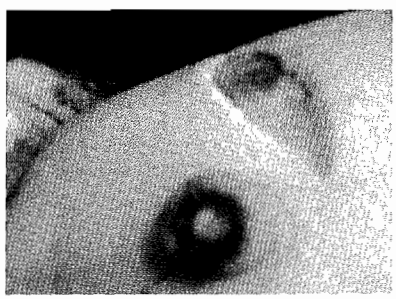

Fig. (3 b) Anterior Abdominal Wall muscles show some color change

The entire bowel was found distended but intact with no evidence of strangulation. The clots were evacuated. Formal laparotomy revealed multiple hepatic haemangiomas, on the inferior surface of the liver, one with active bleeding [Fig 4 a&b].

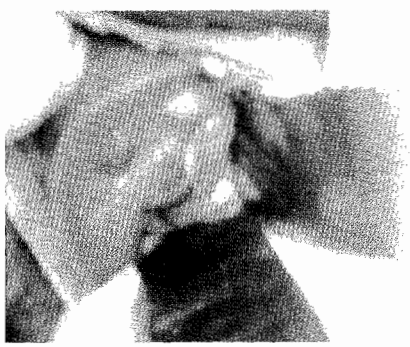

Fig. (4-a) Multiple Liver haemangiomas.

Fig. (4-b) Multiple Liver haemangiomas.

Packing of the site of the active bleeding was done successfully stopped the bleeding. Biopsy of one peripheral lesion was taken after haemostatic suture over the biopsied site, which arrested the bleeding. Again the peritoneal cavity was washed with warm saline, sucked and mobbed dry. The laparotomy and right inguinal incisions were closed in layers after ligation of the patent process vaginalis with vicryl 3/0.

The recovery was uneventful. He was admitted to the nursery, where he was transfused with blood again. His pulse, oxygen saturation, respiratory rate and urine output remained unchanged. Three hour later he suddenly collapsed and arrested. Immediate CPR was performed and the patient had uneventful recovery. Unfortunately, two hour later he had another arrest from which he could not be revived.

Discussion

Hepatic haemangiomas are vascular malformations that rarely affect infants. Out of 25 cases of haemangiomas in infancy during 10 years period Enjolras O, et al found only three patients to have hepatic hemangiomas[1]. They have protean presentation and may be associated with high morbidity and mortality in affected infants despite their histologically benign nature. Clinical manifestations range from asymptomatic self-limiting lesions, symptomatic hepatomegaly, congestive heart failure associated with high-volume vascular shunting and increased pulmonary vascular tone, abdominal compartment syndrome, anaemia, consumptive coagulopathy to sudden death [2-4]. Because of the complex nature of these lesions and their variable angioarchitecture and a spectrum of angiographic findings[5], multiple imaging techniques were required for precise diagnosis[6]. Although there is variation in imaging features of infantile haemangiomas, MRI remains the technique of choice in most patients[7]. Ultrasonography is no longer used for discovering haemangiomas, and

liver scintigraphy does not always show the shape of these tumours[8].

The natural history of the disease as well as the treatment options is confusing. The treatment options include conservative management, medication (steroids and interferons), radiological options (irradiation and selective embolization), and surgical intervention (ligations of feeding vessels, tumor excision)[4, 9-11]. Surgical intervention should be considered only on symptomatic lesions, progressively growing haemangiomas or those tumors which show high risk of bleeding[8] However, there is no supportive evidence to favor any of the above mentioned modalities of treatment[2]. Of the radiological treatment, intra-arterial embolization was found to be a valuable method for treating symptomatic cavernous liver haemangiomas in newborns, however, its role in multifocal ones is questionable [12-14].

Ruptured haemangiomas ranged in size from 3.0 to 25.0 cm, and many were located on the inferior surface of the liver. It is a rare complication and when it occurs the outcome is gloomy with over 70% reported mortality. Our patient was not an exception [4, 15, 16]. There fore, surgical resection of ruptured haemangiomas is recommended in low risk patients, while those with high risk may benefit from transcatheter hepatic arterial embolization[14].

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Case Report: Seminoma in Androgen Insensitivity Syndrome

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Introduction

Androgen insensitivity Syndrome (AIS) (testicular feminization syndrome) is a rare X-linked recessive condition. These patients characteristically have a 46 XY Karyotype and present with a spectrum of phenotypic abnormalities. AIS may be complete (CAIS), that is phenotypically normal women with adequate breast development normal external genitalia, vagina of variable depth, absent uterus, and coarse or absent pubic hair and axillary hair. They are male karyotype with negative sex chromatin.

Partial Androgen Insensitivity Syndrome (PAIS), phenotype range from mildly virilized female with external genitalia (clitorimegaly) to mildly undervirilized male external genitalia (hyopspadius or diminished penile size).

The gonad (undescended) testes may be intraabdominal, inguinal or labial. Malignant transformation of the testis is rare[1].

Here we present a case of a young lady with seminoma arising in CAIS

Case Report

A 30- years old unmarried woman presented to our unit Where?? complaining of primary amenorrhea and abdominal mass for two months. On examination the patient looked feminine, height of 164cm and weight of 57kg, the breasts were well developed but with sparse pubic and axillary hair. On abdominal examination there was a mass about 15 week's pregnancy, firm, slightly mobile, mainly on the right side. On vaginal examination the vulva was circumcised, short blind vagina about 4-5 cm long, uterus and cervix were not felt.

Abdominal ultrasound showed a right sided solid mass with whorled apereance,about 10X12X15cm, uterus is not seen, no ascites, early right hydronephrosis. Renal function was normal.

Laparotomy revealed right sided solid tumor 10X12X15cm with minimal intestinal adhesion, attached by a pedicle to the posterior abdominal wall

There was a small mass (gonad) attached to posterior abdominal wall, there was no uterus, pouch of Douglas was empty but there was no evidence of intraabdominal metastasis. The tumour and biopsies from the small mass (gonad) were sent for histopathology.

Histopathology reported seminoma and normal testis on the other side.

Discussion

The first medical report on AIS was published in 1953 by JM Morris an American Gynecologist. Androgen Insensitivity Syndrome AIS or Testicular Feminization Syndrome (TFS) also known as Morris Syndrome is a rare syndrome characterized by primary amenorrhea, 46XY karyotype, female phenotype and presence of testes rather than ovaries[1]. The incidence of AIS or TFS was reported as 1:20000[2] to 1:62000[3]. It accounts for approximately 10% of cases of primary amenorrhea, ranking third after gonadal dysgenesis and congenital absence of the vagina[4].

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Table: Result of hormonal analysis

	Result	Normal ranges
5.9mlu/l	FSH	F(2-48) M(2-14)
37 mlu/l	LH	F (1.5-12) M (1-15)
Luteal (2-20) 14 nmol/l	6.0 nmol/l Testosterone	Progesterone F (0.35-3.5) M (9-37)

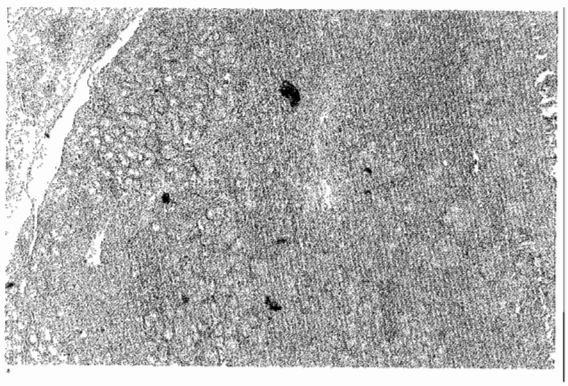

Fig 1: Histopathology of the mass showing seminoma

AIS is a disorder of androgen receptor function and represent the most common detectable cause of male pseudohermaphroditism[5]. The pathogenesis of CAIS involves a defective androgen receptor (AR) gene and end organ insensitivity to androgen, but that of PAIS involves a decrease number or qualitative defect of the AR gene[6]. The human AR gene has been mapped to chromosome Xq11-12[7]. It is a large protein of at least 910 amino acids.

At present more than 100 mutations at the androgen receptor AR gene were reported[8]. The probable explanation of the syndrome is the absence of the cytosol androgen b (binding protein receptor that is normally present in the androgen sensitive tissue). Affected individuals have normal testes with normal production of testosterone and normal conversion of dihydrotestosterone (DHT) which differentiate this condition from 5 alpha-reductase deficiency. Despite normal levels of androgen synthesis the typical post receptor events that mediate the effects of hormones on tissues do not occur. This result in undervirilization of the external genitalia, absence of pubic hair and axillary hair, lack of acne and absence of voice changes at puberty. Because the testes produce normal amounts of Mullerian inhibitory factor (MIF), affected individuals do not have fallopian tubes, uterus or a proximal (upper) vagina, absence of Wolfian duct derivatives (epidydemis,vas deferens seminal vesicles and absence of prostate) but they have well developed breast[9] as a result of conversion of testosterone to ostradiol. Testes are bilaterally retained either in the abdominal 50-70%, in inguinal region 20% or located both in the abdomen on one side and in the inguinal region on the other side 10-30%, and occasionally the testes may be even in the retro peritoneum[10].

In AIS bilateral undescended testes carry a high risk for malignancy, the best evidence suggests that women with CAIS or PAIS retaining their testes after puberty have 25% chance of developing benign tumors, and a 4-9% chance of malignancy[11]. The risk of gonadal malignancy increases with age[10]. Typically patients older than 30 years are at great risk[12] reaching 33% in patients older than 50 years[13].

Our patient was 30 years therefore is at high risk of developing malignancy. The patient was circumcised. Circumcision is a bad habit widely practiced in Sudan. Such operation may change the normal anatomy of the external genitalia producing some confusion in diagnosing abnormalities of external genitalia.

Testicular tumors seen in this syndrome are hamartomas, germ cell tumors (seminoma) and sex cord tumors, Sertoli cell tumors and leydig cell tumours[10].

Orchidectomy is recommended to avoid malignant changes within the intraabdominal testis, but the surgery deferred because such malignancy is quite uncommon before puberty delaying surgery until after puberty allows endogenous estrogen to stimulate development of secondary sex characteristics in the patient.

Testicular biopsy can be taken as soon as the syndrome is diagnosed and finding of in situ seminoma indicates immediate orchidectomy. After orchidectomy estrogen replacement therapy should be started to initiate puberty, maintain feminization and avoid osteoporosis. Progesterone is not needed because there is no uterus. Vaginal length may be sufficiently short to require dilatation.

Most women are satisfied with their psychosexual development, sexual function and satisfied with having been raised as females[11].

Our conclusion is that patients with CAIS should undergo post-puberty gonadectomy because of an increase risk of malignant transformation of the testes seen after puberty. Early testicular biopsy can be offered if CAIS is diagnosed early.

Attention to psychological consideration in such patients is important. The nature of the disease should be discussed clearly and the problem of primary amenorrhea and infertility explained and that they can have a normal sexual satisfaction.

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