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CONTENT

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the Association of Resident Doctors
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3. Scientific letters (Less than 600 words); one table or graph and not more than 5 references.
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Acknowledgments

In a separate section, acknowledge any financial support received or possible conflict of interest. This section may also be used to acknowledge substantial contributions to the research or the preparation of the manuscript made by the persons other than the authors.

References

Cite references in numerical order in the text, inn the superscript format. Do not use brackets. In the references section, references must be numbered consecutively in the order in which they are cited.

References should be according to the format set forth in the Uniform Requirements for Manuscripts Submitted to Biomedical Journals by the International Committee of Medical Journal Editors: (BMJ 1991; 302: 338-01 or N. Engl J. Med 1991; 324: 424-28).

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The following are sample references:

Standard journal article

List first authors:

Halpern SD, Ubel PA, Caplan AL. Solid organ transplantation in HIV-infected patients. N Engl J Med 2002; 347: 284-7.

More than six authors:

Rose ME, Huerbin MB, Melick J. et al. Regulation of interstitial excitatory amino acids concentrations after cortical contusion injury. Brain Res 200, 935: 40-6.

Books and other monographs:

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical Microbiology. 4th ed.

St Louis: Mosby; 2002.

Editor(s), Complier(s) as Author:

Gilstrap LC 3rd, Cunningham FG, Van Dorsten JP, editors. Operative obstetrics 2nd ed. New York: McGraw-Hill, 2002.

Chapter in a Book:

Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p.93-113.

Dissertation

Borkowski MM. Infant sleep and feeding: a telephone survey of Hispanic Americans [dissertations]. Mount Pleasantn(MI): Central Michigan University; 2002.

Worldwide Web (www)

Dushay J, Abrahamson MJ. Insulin Resistance and Type 2 Diabetes; A Comprehensive Review. Available at http://www.medscape.com/viewarticles/501 569 (accessed 20 July, 2007)

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LETTER FROM THE EDITOR

At the dawn of the year 2020 the world received reports of an outbreak of respiratory disease possibly of viral origin which gradually escalated to pandemic proportion. COVID-19 has changed the way we have lived, worked, related with one another and carried out our aspirations in the past months.

As a journal we have had to fend off these and other challenges to ensure the progress of our mandate to deliver carefully researched scientific content of proven excellence to you our esteemed readers. Hence, I welcome you to this edition of the Jos Journal of Medicine.

Special appreciation must go to members of the Editorial Team- the Publication committee and our greatly valued Editorial Advisors. Your patient, consistent and timely support continues to better our serve. My able Deputy Editor Dr Ifiok Umana held two portfolios in this tenure but showed extraordinary commitment to our production process still. You are highly commended sir!

We also highly appreciate the executive officers of the ARD JUTH chapter ably led by Dr. Steven Mawun Lukden have constantly supported and stood with us to ensure continuity for which we are deeply grateful. We pray that god prospers your endeavours even as you move on to higher pedestals of leadership.

Finally, we thank our esteemed authors and you, our readers, for your high regard of and interest in our journal which remains indexed in the African Journal Online (AJOL). Articles and other correspondences can be sent to us via the email; editorjjm@gmail.com.

Thank you as always for choosing the Jos Journal of Medicine, please enjoy the read!

Dr. Udoh, Phillips. A
+234 803 681 0771
phillipsudoh@gmail.com

CONTENT

AWARENESS, PERCEPTION AND PRACTICE ON COVID-19 AMONG NON-CLINICAL HEALTHCARE WORKERS IN PLATEAU STATE SPECIALIST HOSPITAL, JOS, NIGERIA.

Shehu M[1], Shehu H[2], Izang AM[3]

1. Department of Paediatrics, College of Medicine and Health Sciences, Bingham University/Bingham University Teaching Hospital Jos, Nigeria
2. Department of Surgery, College of Medicine and Health Sciences, Bingham University/Bingham University Teaching Hospital Jos, Nigeria
3. Department of Family medicine, Plateau State Specialist Hospital Jos, Nigeria

Corresponding Author- Maryam Shehu
Address: Department of Paediatrics, College of Medicine and Health Sciences, Bingham University/Bingham University Teaching Hospital, PMB 2238, Jos.
email Address: maryamshehu1405@gmail.com. Phone: +2348132951356

Abstract

Background: COVID-19 has evolved into a pandemic. Health Care workers (HCWs) are at increased risk of infection than the general public because their occupation requires them to be in contact with persons with the disease either directly or indirectly.

Objective: To determine COVID-19 knowledge, attitudes, and practice among non-clinical HCW in Plateau State Specialist Hospital(PSSH) Jos.

Design: Cross-sectional study.

Results: Only one-fifth (21%) of participants had university education, while more than one -third (33%) had only secondary school education. More than two-thirdof the knowledge questions were answered correctly by the non-clinical healthcare workers. The attitude of non-clinical workers was fair. Forty one percent reported that only the elderly and people with co-morbidities die from COVID-19.More than half of the participates wrongly believed that the virus cannot survive in hot weather. Of 99 participants, only 23 (23%) believed that the disease will be controlled successfully. However, more than 90% of the participates believed that they have a role to play in the fight against COVID-19. The overall practice of preventive measures among the participants was not good as less than half of the participants wore mask in the last one week to the hospital. More than one -third of them do not have a hand sanitizer and about a quarter of them do not cough or sneeze into a flexed elbow. Two of the practice measures were significantly associated with the level of education with X^2 and p values of 10.56 and 0.03, 12.20 and 0.02 respectively.

Conclusion: The study showed that the knowledge of non-clinical workers on COVID-19 in the hospital was good, however, the attitude and practice measures on COVID-19 was not good. Measures must be taken to educate the non-clinical HCW on the need to have good attitude and practice, to protect them from the high risk linked to their job and environment as HCW.

Keywords: Awareness, perception, practice, non-clinical, HCW, covid-19.

INTRODUCTION

The novel virus recently discovered in China was first named 2019 novel corona virus (2019 n-CoV) in December 2019. The name of the virus was later changed to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)when the genomics of the virus was sequenced,and it showed that shared has up to 79.5% resemblance with SARS-CoV that caused the pandemic in 2002-2003.[1-4]

COVID-19 evolved into a pandemic; the infection has spread to over 200 countries including Nigeria. Globally, as of August 16th, 2020, there have been more than21M confirmed cases of COVID-19, including over 700,000 deaths reported by WHO.[5]Health Care workers (HCWs) are at risk of infection because apart from the community acquired infection, their occupation gives them additional risk of being exposed to persons and environmental surfaces with the virus.[6-10]

SARS-CoV-2 is spread by droplet and contact, it is therefore recommended that we ensure social distancing, routine droplet barrier precautions, environmental hygiene, and overall sound infection prevention practice is indicated.[11]The factors that have been implicated for the transmission of the disease among HCWs include overcrowding, absence of isolation room facilities, environmental contamination. Furthermore, this has been complicated by inadequate awareness of infection prevention practices.[12]

In a hospital setting, there are clinical and non-clinical staff, the clinical staff come in contact with the patients to help in diagnosis, care and treatment while the non-clinicalstaff do interact with patients but do not actually provide medical care. The non-clinical staff provide services like medical billers, hospital executives, receptionists, and anyone who works behind the scenes at a hospital such as human resources, IT, biomedical technicians, administrative assistants, etc.[13]

The three main mode of transmission routes for the COVID-19 are: droplets transmission, contact transmission, and aerosol transmission. When a person infected with the disease coughs or sneezes, respiratory droplets are ingested by people in close proximity; contact transmission can occur when an individual touches a surface or object contaminated with the virus and subsequently touch their mouth, nose, or eyes, its being established that the virus can survive on objects or surfaces for 9 nine daysand aerosol transmission can occur when respiratory droplets mix with air, forming aerosols which can be inhaled leading to the disease.[14-17]

As at the time of writing this report, there is no approved treatment or vaccination against Covid-19. Therefore, good infection control measure is the main intervention to reduce the spread of the virus in both health care settings and the community.[18]Knowledge of a disease can help modify HCWs' behavior and practice towards infectious diseases like Covid-19.[19-20] Educating the HCW on how prevent the transmission of a highly infectious respiratory diseases like Covid-19 will play a major role in limiting the spread of the infection. This most important in under-developed countries like Nigeria, where our health care systems are not developed and lack the capacity to deal with outbreaks like this.[21]

The education of the non-clinical staff on Covid -19 in the early stage of the pandemic will affect their attitudes and behaviours and this is important to avoid occupational exposure. The aim of this study is to investigate the Knowledge, attitude and practice of non-clinical HCW in PSSH towards Covid-19.

RESULTS

The female to male ratio is 1:1.3, the age group of 41-50 years had the highest percentage of workers with 33%, while the least age group were workers who's aged were greater than 50 years with 10%.Table 1

Table 1: Demographic distribution of non- clinical staff in PSSH

Variable	***Frequency***	***Percentage***
Sex		
Male	51	51.5
Female	37	37.4
No response	11	11.1
Total	99	100.0
Age group		
<30	20	20.2
31-40	24	24.2
41-50	33	33.3
>50	10	10.1
No response	12	12.1
Total	99	100.0
Education		
Primary	9	9.1
Secondary	33	33.3
Diploma	32	32.3
B.Sc	21	21.2
Masters	2	2.0
No response	2	2.0
Total	99	100.0
Job in the hospital		
Admin/Acct	7	7.1
Physiotherapy/Lab	30	30.3
Transport/works/security	27	27.3
Attendants/radiology/records	35	35.4
Total	99	100.0

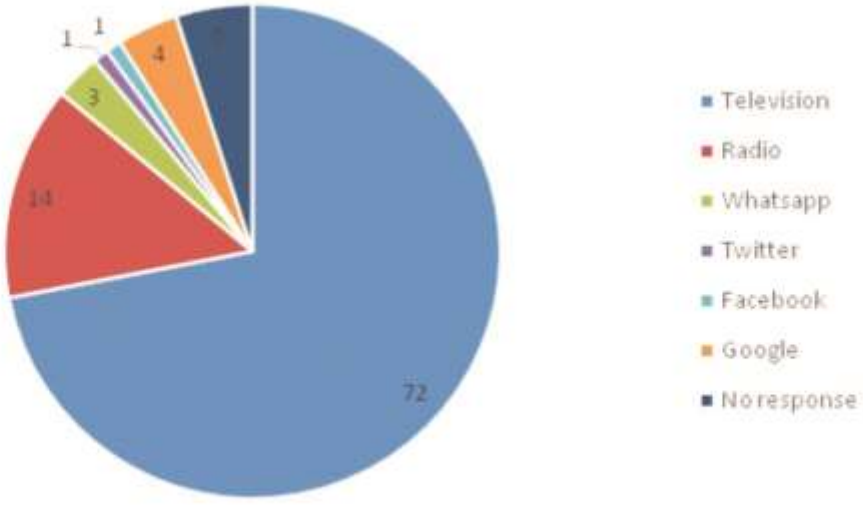

Figure 1. Source of information

The knowledge of the non-clinical HCW on COVID-19 disease being caused by a virus was good, with 87% getting the correct answer. Only 2% disagreed that COVID-19 is caused by a virus. More than 30% of the workers did not know if Chloroquine has been approved as the drug of treatment for COVID-19.Table 2
Table 2: Frequency of knowledge for non-clinical staff in PSSH.

Variables	I Agree	I don't know	I Disagree	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Q2	87(87.9)	10(10.1)	2(2.0)	99(100.0)
Q3	87(87.9)	7(7.1)	5(5.0)	99(100.0)
Q4	88(88.9)	9(9.1)	2(2.0)	99(100.0)
Q5	82(82.8)	11(11.1)	6(6.1)	99(100.0)
Q6	84(84.8)	15(15.2)	0(0.0)	99(100.0)
Q7	80(80.8)	15(15.2)	4(4.0)	99(100.0)
Q8	73(73.7)	24(24.3)	2(2.0)	99(100.0)
Q9	89(89.9)	9(9.1)	1(1.0)	99(100.0)
Q10	89(89.9)	9(9.1)	1(1.0)	99(100.0)
Q11	26(26.3)	35(35.3)	38(38.4)	99(100.0)
Q12	32(32.3)	21(21.3)	46(46.5)	99(100.0)
Q13	54(54.5)	28(28.3)	17(17.2)	99(100.0)

The attitude of the workers on the role they have to play in the control of the disease was good with 94% of them believing they have a role to play. However, the practice of the HCW was not good because 47% of the workers have not worn mask in the hospital in the last one week.Table 3

Table 3: Frequency of Attitude and practice for non-clinical Staff in PSSH

Variables	Yes	No	No response	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Q14	20(20.2)	79(79.8)	0(0.0)	99(100.0)
Q15	41(41.4)	57(57.6)	1(1.0)	99(100.0)
Q16	53(53.5)	45(45.5)	1(1.0)	99(100.0)
Q17	50(50.5)	48(48.5)	1(1.0)	99(100.0)
Q18	39(39.4)	10(10.1)	50(50.5)	99(100.0)
Q19	23(23.2)	68(68.7)	8(8.1)	99(100.0)
Q20	94(95.0)	3(3.0)	2(2.0)	99(100.0)
Q21	84(84.9)	2(2.0)	13(13.1)	99(100.0)
Q22	34(34.3)	61(61.7)	4(4.0)	99(100.0)
Q23	48(48.5)	47(47.5)	4(4.0)	99(100.0)
Q24	51(51.5)	33(33.3)	15(15.2)	99(100.0)
Q25	62(62.7)	33(33.3)	4(4.0)	99(100.0)
Q26	87(87.9)	9(9.1)	3(3.0)	99(100.0)
Q27	72(72.7)	25(25.3)	2(2.0)	99(100.0)

There was a significant association between the practice of avoiding crowded places and education, with χ^2 value of 10.6 and p value of 0.03. There was no significant association between the practice of wearing a mask to the hospital and level of education, χ^2 value of 0.97 and p value of 0.91. Table 4

Table 4: Comparison of Practice and education for non-clinical staff in PSSH

Variable	Education							
	Primary	Secondary	Diploma	B.Sc	Masters	Total	X^2	p
Q22								
Yes	1(3.0)	17(51.5)	9(27.3)	6(18.2)	0(0.0)	33(100.0)	10.556	0.032
No	8(13.1)	13(21.3)	23(37.7)	15(24.6)	2(3.3)	61(100.0)		
Total	9(9.6)	30(31.9)	32(34.0)	21(22.3)	2(2.1)	94(100.0)		
Q23								
Yes	4(8.7)	17(37.0)	13(28.3)	11(23.9)	1(2.2)	46(100.0)	0.972	0.914
No	5(10.6)	14(29.8)	17(36.2)	10(21.3)	1(2.1)	47(100.0)		
Total	9(9.7)	31(33.3)	30.32.3)	21(22.6)	2(2.2)	93(100.0)		
Q24								
Yes	3(5.9)	19(37.3)	20(39.2)	9(17.6)	0(0.0)	51(100.0)	9.189	0.057
No	6(18.2)	8(24.2)	8(24.2)	9(27.3)	2(27.3)	33(100.0)		
Total	9(10.7)	27(32.1)	28(33.3)	18(21.4)	2(2.4)	84(100.0)		
Q25								
Yes	9(15.0)	14(23.3)	22(36.7)	13(21.7)	2(3.3)	60(100.0)	12.204	0.016
No	0(0.0)	17(51.5)	8(24.2)	8(24.2)	0(0.0)	33(100.0)		
Total	9(9.7)	31(33.3)	30(32.3)	21(22.6)	2(2.2)	93(100.0)		
Q26								
Yes	9(10.5)	24(27.9)	31(36.0)	20(23.3)	2(2.3)	86(100.0)	9.408	0.052
No	0(0.0)	7(77.8)	1(11.1)	1(11.1)	0(0.0)	9(100.0)		
Total	9(9.5)	31(32.6)	32(33.7)	21(22.1)	2(2.1)	95(100.0)		
Q27								
Yes	9(12.9)	18(25.7)	25(35.7)	16(22.9)	2(2.9)	70(100.0)	8.223	0.084
No	0(0.0)	13(52.0)	7(28.0)	5(20.0)	0(0.0)	25(100.0)		
Total	9(9.5)	31(32.6)	32(33.7)	21(22.1)	2(2.1)	95(100.0)		

DISCUSSION

The number of workers with master's degree among the non-clinical healthcare workers were the least cadre of workers, while more than one third of the workers had only secondary school education. This could be explained by the fact that some of the non-clinical HCW do not require special training to perform their task, they provide most of the unspecialized services required in the hospital.

The workers major source of information was from television, this is expected as the disease is a novel one that has taken the world by storm being a rapidly spreading and infectious disease. A lot of the information's generated about the disease were being made available on media screens so as to rapidly educate the public about the disease. Therefore, their knowledge on COVID-19 disease was good in some aspect, with more than two-third knowing the aetiolgical agent causing the disease, the city where it was first identified, the main clinical symptoms of the disease, its incubation period, the mode of spread of the disease and ways and methods of preventing the disease. However,

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COLORECTAL CARCINOMA IN AN 11-YEAR-OLD FEMALE: A CASE REPORT

Akpa PO (MBBS, FMCpath)[1,2*],Abaniwo SA (MBBS)[1]RichardKS(MBBS)[1]Shitta AH (MBBS, FWACS)[3] Jatau IA (MBBS)[3] Kwaghe BV (MBBS, FMCpath)[1]

Affiliations

[1]Department of Histopathology, Jos University Teaching Hospital, P.M.B 2076, Jos Plateau State, Nigeria.

[2]Department of Histopathology, University of Jos, P.M.B 2084, Jos Plateau State Nigeria.

[3]Department of Surgery, Jos University Teaching Hospital, P.M.B 2076, Jos Plateau State, Nigeria.

Correspondence: Akpa Philip Ojile, Department of Histopathology, Jos University Teaching Hospital, Jos plateau state Nigeria. P.M.B 2076. akpaphilip@yahoo.com. 07035128504

ABSTRACT

Introduction: Colorectal carcinoma is a leading cancer and cause of mortality in the adult population but occurs rarely in the pediatric population. The incidence of this tumour in the pediatric population is increasing worldwide. Diagnosis is often delayed in children, with majority of their tumours being poorly differentiated. The purpose of this case report is to document the rare occurrence of this tumour in a very young child and to increase its awareness in practicing doctors.

The Case: We present a case of an 11-year-old female child with a 2 month history of recurrent constipation, 3-day history of abdominal distension and pain and a 2-day history of bilious projectile vomiting. An abdominal ultrasound scan detected distended loops of bowel with an assessment of intestinal obstruction of unknown cause. Surgery was a mid-line laparotomy with segmental bowel resection of splenic flexure tumour and divided colostomy. Pathological examination revealed a 15cm length of large bowel segment with a circumferential constricting tumour in the mid portion of its length. Histological examination revealed a mucinous adenocarcinoma. Patient received adjuvant chemotherapy, had reversal of colostomy and is doing well 5 months postoperatively with no recurrence.

Conclusion: Pediatric colorectal carcinoma cases are challenging due to their tendency to be misdiagnosed in addition to other bad prognostic factors often encountered. A complete assessment is necessary in all patients who present with clinical features suggestive of this disease regardless of age.

Keywords: Colorectal carcinoma, Case report, pediatrics, Plateau state, child, mucinous, Jos, Nigeria

INTRODUCTION

Colorectal carcinoma is amongst the leading cancers in adults, but is rare in the pediatric population.[1-5]It accounts for about 9.4% of cancer diagnosis and 7.9% of total cancer deaths world-wide, however only an estimated 1% of colorectal carcinomas occur in patients less than 30 years.[2,4]Familial adenomatous polyposis and lynch syndrome are associated with a substantially higher percentage of colorectal carcinomas in children than in adults.[1,4,6]Its diagnosis is not usually suspected in the pediatric population even when they manifest symptoms that will immediately raise suspicion in an adult, hence diagnosis is often delayed.[1,3]Colorectal malignancies have a poorer prognosis in children when compared to that of adults owing to late diagnosis and more aggressive tumours diagnosed in this age group.[1,4,5]

There is a paucity of published detailed literature on pediatric colorectal carcinoma in Nigeria.Musa et al reported a case of rectal carcinoma in a 9-year-old male in 2007 at a tertiary health care center in south-western Nigeria. The patient had a six-month history of abdominal pain, recurrent distension, constipation, bloody stool and progressive weight loss with a positive family history of colorectal carcinoma.[7]The diagnosis was missed on four visits to different private health facilities and was finally

made on presentation to the tertiary health facility, at this point the bowel was obstructed and the tumour metastatic. The patient had laparotomy, with resection of the tumour which was a poorly differentiated adenocarcinoma on pathological examination. Post-operative recovery was poor due to poor pre-operative state and advanced disease. The patient died 35 days'post-surgery.[7] In a 30-year (1979-2008) review by Ibrahim et al at the University of Ilorin Teaching Hospital in north-centralNigeria,31.5% of their colorectal carcinoma casesoccurred in young patients (less than 40 years). The mean age at presentation was 31 years with the youngest patient being 16 years.[8] It occurred slightly more frequently in men, a majority occurred in the rectum and most cases presented in advanced stages with poor outcome.[8] We are presenting this case because of the rarity of this tumour in the index patients age group in addition to raising awareness and index of suspicion when assessing pediatric patients with suspicious gastro-intestinal symptoms.

THE CASE

History and symptoms

An 11-year-old female patient who presented with a 2-month history of recurrent constipation, a 3-day history of progressively increasing abdominal swelling and pain, with an associated 2-day history of biliousprojectile vomiting. There was no associated hematochezia and melena. No family history of colorectal malignancies.

Pre-operation findings

On examination the patient was pale and dehydrated with a pulse rate of 100 beats per min, respiratory rate of 30 cycles per min and temperature of 36.5°C. Abdomen was distended and moved with respiration, the abdominal girth was 64cm, at 12cm from the xiphisternum. There were observable peristaltic movements and borborygmi. The hernia orifices were intact, there were no palpable intra-abdominal organs or masses. Percussion notes were tympanitic, bowel sounds were hyperactive, with partially distended floating bowel loops. Digital rectal examination revealed an empty rectum, the procedure was tender and the gloved finger was stained with blood. There was no ascites.

Investigations done

Serum urea, creatinine and Electrolytes were within normal range, packed cell volume was 32%. **Abdominal ultrasound scan** revealed floating gaseously distended loops of bowel demonstrating to and fro peristalsis. The liver, spleen, gall bladder, pancreas, kidneys and urinary bladder appeared normal on ultrasound scan, there was no ascites. An assessment of Intestinal obstruction of unknown cause was made.

Intraoperative findings

Operation was performed after resuscitation and obtaining an informed consent from the patient's parents. Abdominal cavity was approached via a midline laparotomy incision. There were distended loops of small bowel and asplenic flexure nodule. A 15cm segment of intestine was resected. The resected segment extended from the distal transverse colon to the proximal descending colon with unaffected intestine flanking the tumour on both sides. A single enlarged lymph node was identified in the attached mesentery and there was no ascites. A Left sided divided colostomy was appliedand the abdominal cavity was closed in layers.

Pathology of specimen

On gross examination the specimen consisted of a segment of intestine that measured 15cm in length, with its mesenteric attachment and a single enlarged mesenteric lymph node. Cut open along its anti-mesenteric border revealed a circumferential constricting mass midway along the length of the bowel that narrows and completely occludes the segment of intestine. The constricted segment of bowel measured 3 cm in length and 1.5cm in wall thickness. The mucosa at the constricted portion was nodular while the mucosa adjacent to the mass on both sides appear roughened and hyperemic. Samples were taken from the constricted portion (mass), the enlarged lymph node, proximal resection margin and distal resection margin.

Figure 1. Resected segment of large intestine with a circumferential constricting mass (arrow) along its length.

Microscopy

Histological sections of the colonic mass showed infiltration of all layers of the intestinal wall by neoplastic epithelial cells. These neoplastic epithelial cells are a mixed population of moderately differentiated neoplastic acini and epithelial cell floating in pools of mucin. The epithelial cells lining the malignant glands exhibit nuclear pleomorphism and hyperchromasia, increased nucleo-cytoplasmic ratio and loss of polarity. The epithelial cells in the pools of mucin exhibit moderate atypia with some signet ring forms. Resection margins were free of tumour infiltration and lymph node showed sinus histiocytosis with no neoplastic cell infiltration. A diagnosis of **Mucinous adenocarcinoma** (pT3,N0, MX) (Dukes stage B) was made.

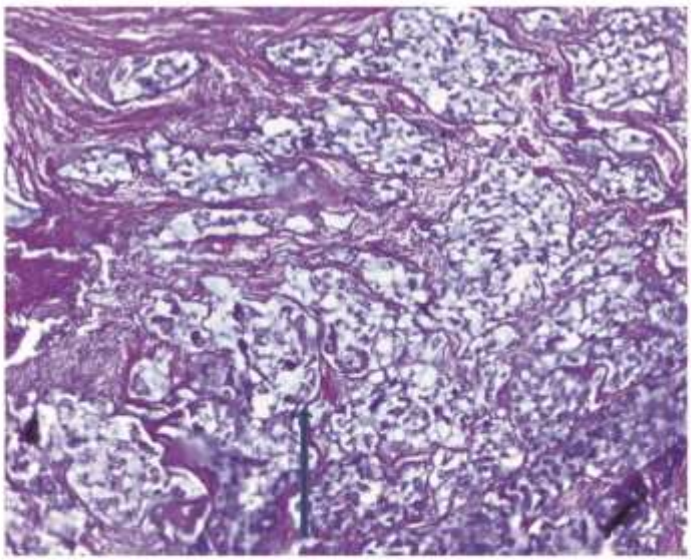

Figure 2. Photomicrograph (hematoxylin and eosin x 100 magnification) showing malignant epithelial cells floating in pools of mucin and dissecting through the intestinal wall

DISCUSSION

Colorectal carcinoma is a common tumour in the adult population peaking at about the age of 65 years, with a life time risk of five to six percent of developing this tumour.[1-6] Conversely it isa rare cancer in the pediatric population with an incidence of 1-2 cases per a million of population per year.[1-3,5] This tumour rarely occurs before the age of 20 years and accounts for less than 1% of neoplasia in the pediatric population.[1,3] The occurrence of colorectal carcinoma appears to be an absolute exception in the pre-pubertal age group with the incidence dropping drastically in patients below the age of 10 years.[2,4] The incidence of colorectal carcinoma in the developed countries of Europe and north America is higher than in underdeveloped countries of Africa and Asia.[3] The incidence in the young appears to be slowly growing worldwide.[9] A familial predisposition does not commonly lead to an increased risk of its occurrence in individuals before the age of 20 years.[1] The common age range of diagnosis of colorectal carcinoma when it occurs in children is in the second decade, commonly between 15-19 years.[4,5] Colorectal carcinoma in the pediatric age group shows a male predominance with a male to female ratio of 2:1.[4,5,6]

The index case is the youngest documented case of diagnosed colorectal carcinoma at the Jos University Teaching Hospital (JUTH) since reliable data documentation began in the 1980s. Previous reports from this institution show that colorectal carcinoma occurs relatively commonly in young patients, but nonewas as young as the index case. In a 1999 publication by Sule et al at the Jos University Teaching Hospital, 35 (23.6%) out of 149 cases of colorectal carcinoma occurred in patients 30 years and below, the mean age at diagnosis was 25(STD+/-6) years with a male to female ratio of 1.2:1. The rectum was the most common site and majority presented in advanced stages with poor outcome.[10]

The risk of developing colorectal carcinoma is higher in populations that have adopted the so-called western lifestyle which entails the consumption of alcohol, red meat and low fiber foods in association with a sedentary lifestyle, being obese and smoking cigarettes.[11,12] A majority of colorectal carcinomas occur sporadically, with the rest occurring in association with genetic susceptibility syndromes.[9] The percentage of colorectal carcinomas occurring in the setting of genetic susceptibility, ranges from between 5-30% of pediatric colorectal carcinoma cases, this percentage is higher than that seen in adults.[1,4,5,6,9] The genetic syndromes associated with colorectal carcinoma include hereditary non-polyposis colon cancer, familial adenomatous polyposis, hereditary mixed polyposis syndrome, Peutz-Jeghers syndrome and familial juvenile polyposis.[1,3-6] The Bethesda guidelines statethat patients diagnosed with colorectal carcinoma before the age of 50 should have genetic testing for susceptibility syndromes.[9] The index case has no known family history of colorectal carcinoma and genetic tests were not carried out to test for susceptibility syndromes.

The clinical sign and symptoms of colorectal carcinoma are similar in children and adults.[1,3] These clinical manifestations can however be non-specificand easily lead to misdiagnosis in pediatric patients.[1-3,6,9] Features such as change in bowel habits, bleeding per rectum, abdominal pain, anemia and weight loss can be mistaken for features of irritable bowel syndrome, inflammatory bowel disease, hemorrhoids, gastroenteritis and eating disorders.[1,9] The presenting symptoms of the index case would immediately raise the suspicion of colorectal carcinoma in an adult but the diagnosis wasn't suspected until during surgery and later confirmed on histopathological examination.

Colorectal carcinomas occur more commonly in the proximal colon (ascending and transverse colon) in children while majority of adult tumours occur in the distal colon within 25cm of the anus.[4,5] Published literature on colorectal carcinoma in young patients in Nigeria have however showed a predominance of rectal tumours.[8,10] The index case occurred at the splenic flexure which is relatively proximal and in keeping with the site of occurrence in children.A majority of colorectal carcinomas in adults are moderately or well differentiated adenocarcinomas, in contrasta majority of child-hood colorectal adenocarcinomas are poorly differentiated.[1,3,5] Mucinous and signet ring adenocarcinomas occur twice more frequently in children than in adults.[1] While mucinous tumours make up only 5% of adult colorectal carcinomas, it accounts for greater than 50% of the pediatric colorectal carcinomas.[3,5,6] The index case is a

mucinous adenocarcinoma which is a poorly differentiated tumour.The detection of unique microsatellite instabilities in addition to the detectionof more aggressive and less chemo-sensitive colorectal tumours in children suggests there may be differences in the pathogenesis of these tumours compared to their counterparts in adults.[1,2]

The duration from onset of symptoms to diagnosis of colorectal carcinomasin children is usually long and ranges from 2 to 6 months.[1,2]Children and adolescents present with more advanced disease than their adult counterparts with about 60-80% of pediatric cases diagnosed in Dukes Stages C and D.[2-6]Vague symptoms, decreased awareness, and increased frequency of poorly differentiated types result in this advanced stages at presentation.[4,6]The index case was diagnosed in Dukes stage B which is relatively early with hope of long term survival or possible cure.

Complete surgical resection when possible is the most effective form of treatment and the only hope for cure or long term survival in pediatric colorectal carcinoma cases.[3,4]Most cases are however diagnosed late and no longer surgically resectable with locally advanced disease or metastasis.[1]In advanced disease adjuvant multi-agent chemotherapy based on a fluorouracil backbone with folinic acid, oxaliplatin, or irinotecan is commonly used.[3,4,5]The index case was completely surgically removed with tumour free resection margins. The single enlarged lymph node seen was also free of tumour cells. Patient received adjuvant chemotherapy using FOLFOX-4 regimen (oxiplatin, leucovorin and 5-fluorouracil). Colostomy was successfully reversed and patient is currently doing well 5months' post-surgery.

The 5 year survival rate for colorectal carcinoma in children is relatively lowwhen compared to adult survival rates, 5 year survival ranges from 5 to 28%.[1]Factors responsible for the poor outcomes include delay in diagnosis resulting in late stage disease, poor differentiation of the tumours and also limited experience of pediatric oncologists and surgeons.[2-5]A histological finding of mucinous histology, signet ring cell rate of greater than 10% and incomplete surgical resection are poor prognostic signs.[1]At presentation 60% of pediatric patients have luminal obstruction as opposed to 18% seen in adults, at surgery less than 40% of pediatric tumours can be completely resected as against 90% in adults. [6]The survival rates of pediatric colorectal carcinoma patients do not differ significantly between developed and developing countries.[4,5] The index case was detected in Dukes Stage B with a fair chance of long term survival, however the mucinous adenocarcinoma morphology is an indication for more aggressive treatment and patient monitoring.The carcino-embryonic antigen (CEA) measured at 1-month post-surgery was 2.32ng/ml which within the normal range and a good prognostic sign.

CONCLUSION

The management of pediatric colorectal carcinoma is challenging owing to its tendency to present late, the occurrence of aggressive tumours and relatively less experience among pediatric surgeons and oncologist in management of this disease. The index of suspicion should therefore be raised in assessing pediatric patients with suspicious gastro-intestinal symptoms in order to make early diagnosis and improve survival.

CONSENT

Is not applicable (no patient identifiers)

ETHICALAPPROVAL

Not applicable

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COMPETING INTERESTS

Authors of this article declare that there are no competing interests

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AN UNUSUAL FINDING: AORTIC DISSECTION IN A PATIENT WITH AIDS ON ANTIRETROVIRAL THERAPY. A CASE REPORT AND REVIEW OF LITERATURE

Shut G. Zi[1], Dashan Domshak[1], Amusa G. Adeniyi[1], Awunah D. D[2], Adeniran Blessing[2], Inanayi B. [2], Chollom Kenneth[2]
Cardiology Unit, Department of Internal Medicine, Jos University Teaching Hospital, P.M.B 2076, Jos, Nigeria.
Correspondence Ganiyu A. Amusa
E-mail drganiamusa@gmail.com

Abstract
The aorta is said to be dissecting when there is separation of the layers within the aortic wall. It is caused by a circumferential or less frequently, transverse tear of the intima. Even though aortic dissection is relatively uncommon, it is a catastrophic illness that requires early and accurate diagnosis and treatment for patient survival. Human immunodeficiency virus infection is an increasingly important cause of heart disease. Availability of treatment with highly active antiretroviral drugs has prolonged patient's life expectancy but has also increased the incidence of non-AIDS co-morbid conditions.

Many cardiovascular diseases have been described in HIV infected individuals, among which is aortic involvement which manifest as: aortitis, aneurysms and dissections. HIV infected individuals also suffer from vascular lesions such as large artery vasculopathy secondary to vasculitis and accelerated atherosclerosis of the coronary arteries. Accelerated atherosclerosis has been linked to patients on protease inhibitors used as part of Highly Active Antiretroviral Therapy (HAART) regimen and have also been implicated in a lipodystrophy syndrome. Aortic dissection has a wide range of clinical presentations.
To make the diagnosis of aortic dissection, a high index of suspicion is required, especially in patients with predisposing risk factors, e.g., hypertension, aneurysmal disease of the aorta, or a familial connective tissue disorder. Typically, the patient is a hypertensive male in his 60s, who presented with a history of abrupt onset of chest pain. We present a case of Aortic dissection in HIV patient on ART with background Hypertension.

CASE REPORT A 55-year-old civil servant who is a known RVD patient diagnosed 16 years ago and regular on HAART and diagnosed with hypertension 3 years ago on moduretic presenting with complains of sudden chest pain which was said to be sharp and associated with difficulty in breathing. Symptoms persisted for four days before he was admitted. He is obese with a BMI of 34. He was in respiratory distress, with a regularly irregular pulse and a wide pulse pressure.

Chest X-ray done revealed presence of cardiomegaly and widened mediastinum, ECG findings included sinus tachycardia with features of chamber enlargements and an Echocardiography revealed presence of aortic aneurysm alongside DCM with Pulmonary hypertension. He was initially managed as a case of hypertensive heart disease in failure precipitated by suspected Acute Coronary Syndrome. A CT angiography which was done confirmed a descending aortic aneurysm with presence of dissection. He was reviewed by Cardiothoracic Unit on that account. Unfortunately, surgery could not be done due to unavailability of needed surgical facilities.
He was placed on oral medications and discharged home after adequate counselling to be on regular clinic follow up.

Keywords Aortic dissection, HIV, ART, Hypertension

INTRODUCTION

The aorta is said to be dissecting when there is separation of the layers within the aortic wall. Propagation of dissection (proximally and distally) in the intimal layer of the aorta is brought about by tears secondary to blood entering the intima-media space.[1] The aortic wall is made up of the tunica intima, tunica media and tunica adventitia.

The tunica intima, which is the innermost layer, is thin, delicate, lined by the endothelium and is easily traumatized. The tunica media imparts strength to the aorta and consist of laminated but intertwining sheets of elastic tissue.[2] the aorta has its maximum allowable tensile strength because of the arrangement these sheets in a spiral fashion. The adventitia which is the outermost layer consist largely of collagen. The adventitia houses the vasa vasorum which supplies blood to the outer half of the aortic wall.

The adventitia of the aorta houses the nervivascularis, which is a bundle of nerve fibers that are involved in the production of pain whenever there is acute stretching of the aortic wall from a dissection.[3] the aorta is particularly prone to injury and disease from mechanical trauma because its wall is exposed to high pulsatile pressure and shear stress as a result of the water hammer effect. With aneurysmal dilatation, the aorta becomes more prone to rupture than any other vessel because of wall tension as governed by the Laplace law is intrinsically high. From results of autopsies conducted, aortic dissection evidence is found in 1-3% (about 1 in 350 cadavers).[4] Bacewicz et al reported a case of HIV and aortic dissection type lwhich the patient was successfully treated with surgical repair in Detroit Michigan.[5] Aliyu and co-workers reported a case of intramural aortic hematoma in an 11-year-old girl with Marfan's syndrome in Kano, Northwest Nigeria. Sule AZ et al reported a case series of infrarenal abdominal aortic aneurysm (without dissection) in Jos, Nigeria. Two cases of Aortic dissection were reported in Jos University Teaching Hospital in 2007 by Kumtap et al.[6] Aortic dissection is rare in individuals younger than 40years of age.

Ascending aortic dissection occurs most commonly in individuals between the ages of 50 and 60 while descending aortic dissections are more commonly encountered in older individuals with a peak at 60 to 70 years of age. The typical aortic dissection patient is a male in his sixth decade of life. Infection with Human immunodeficiency Virus is characterized by a chronic disease process with systemic multiorgan involvement. In the early years of the Acquired Immune Deficiency Syndrome (AIDS) epidemic, many patients suffered and died from serious opportunistic infection partly because of their compromised immune system.

The use of HAART in HIV patients has significantly reduced HIV-related infectious complications and improved their survival. This improvement, combined with the metabolic effects of antiretroviral treatment, has increased the risk of cardiovascular diseases. HIV patients share many cardiovascular risk factors with the general population, but they also have factors specific to their condition that include the HIV virus itself, HIV replication, chronic inflammation, and exposure to HAART.

In a significant number of patients, the immediate cause of death is cardiovascular complications. Cardiovascular disease spectrum that can be depicted at imaging include: dilated cardiomyopathy, embolism, pericardial effusion, pulmonary hypertension, endocarditis, vasculitis, coronary artery disease, aneurysm, atherosclerotic cardiovascular disease and cardiac tumors related to AIDS. With effective antiretroviral therapy, cardiovascular disease has gained prominence as a cause of mortality and morbidity HIV-infected persons.[2]

In the elderly population aortic dissection commonly presents with a history of chronic hypertension. When intervention is not rapid, mortality is very high. In HIV infected patients, aortic dissection is a very uncommon cardiovascular complication.

CASE DESCRIPTION

MS, a 55-year-old Ron man who presented with a two-day history of sudden chest pain and difficulty in breathing. Chest pain was retrosternal, sharp and radiates to the back and occasionally to the left shoulder. Difficulty in breathing was initially only present following moderate activity but worsened to occur at rest.

He had Paroxysmal Nocturnal Dyspnoea and orthopnea. There is associated history of diaphoresis. He had cough which also began two days prior to presentation and was productive of whitish sputum. There was no history of leg

swelling. He had history of intermittent claudication. He is a known hypertensive diagnosed 3 years ago, on tab moduretic. He was diagnosed to have Retroviral disease 16 years ago and has been regular on his HAART medications and follow up. He was said to have been rushed to a private clinic on account of symptoms where his systolic BP was found to be 80mmHg and DBP could not be ascertained, he was then referred here.

There is history of significant alcohol ingestion for about 20 years, during which he had an average weekly consumption of about 30 units. There is history of smoking within that period which estimated to be 3 pack years. He had no history of consumption of herbal medications. He is married in a monogamous setting with 2 children. There was no family history of hypertension, diabetes, heart disease or sudden death in the young. Physical Examination He was obese (weight: 96.7Kg, height: 1.68m, BMI: 34kg/m2). He was not pale, afebrile, anicteric, not dehydrated, acyanosed, with no significant peripheral lymphadenopathy, no pedal oedema.

His pulse rate was 108/min, regularly irregular and Heart rate was also 108/min with S1, S2, S4 and loud A2 heard. BP was 140/50mmHg, JVP was elevated. The Apex Beat was not localized due to thick anterior chest wall. His respiratory rate was 32 cycles per minute, percussion notes were resonant and breath sounds were vesicular in all lung fields with fine bi-basal crepitations. His abdomen was distended, soft, moves with respiration with no areas of tenderness. There was no palpable organomegaly, intra-abdominal masses or ascites. He was conscious and well oriented in time, place and person. He had no focal body weakness.

He had a Chest X-ray done which showed features of cardiomegaly, unfolded aorta, widened mediastinum and bilateral pulmonary infiltrates. He had an ECG done which showed sinus rhythm, rate 100/min, LAD LAE, RAE, LVH and RVH. An Assessment of Ischaemic Heart Disease in failure in a known hypertensive and RVD was made. The following investigations were requested: Echo, cardiac enzymes, troponin T, I, CK MB, Fasting Lipid Profile, E/U/Cr uric acids, LFT. Abdominal USS, Urinalysis, FBC + ESR, HbsAg, Anti-HCV. He was placed on tabs Telmisartan 40mg daily, Tabs spironolactone 25mg daily, Tabs metoprolol 50mg daily, tabs clopidogrel 75mg daily, IV furosemide 80mg am, 40mg pm, tab rosuvastatin 40mg daily.

He was then admitted into the male medical ward. however. patient declined admission on financial grounds despite adequate counselling on the gravity of medical condition and need for admission. He was allowed to go home on tabs furosemide 80mg twice daily and other prescribed medications. He was to return in clinic in a week time with results of requested investigations for review. He presented two days later at the Accident and Emergency due to worsening difficulty in breathing and chest pain and also had two episodes of vomiting. Pulse rate was now 84/min and regular.

He was assessed to have hypertensive disease in failure (NYHA III) precipitated by Acute Coronary Syndrome, chest infection and poor drug compliance with background RVD on HAART. He was admitted and placed on outlined anti-failure and antithrombotic medications alongside IV Augmentin. Random blood glucose done was 8.9mmol/L other investigations available included PCV 38%. The next day following admission, the cardiology team was invited to review and co-manage the patient. The cardiology unit carried out an Echocardiography which revealed Hypertensive Dilated Cardiomyopathy with pulmonary hypertension and aortic aneurysm.

He was placed on Telmisartan tablets while lisinopril was discontinued.

Two days later, a CT angiography was requested which was carried out and results confirmed presence of a Debakey 1 aortic aneurysm with presence of dissection.

Laboratory Parameter and Reference Range

Parameter	Result	Reference Range
Total Protein	75	62-80g/L
Total Albumin	43	
Total Bilirubin	8.6	3.4-17umol/L
Alkaline Phosphatase	39	21-92 IU/L
Alanine Transaminase	47	Up to 40 IU/L
Aspartate Transaminase	140	Up to 40 IU/L
Packed Cell Volume	40.1	56-54
Total White Blood Cell Count	10	2-8.2 x 10^ 9/L
Neutrophils	70%	
Lymphocytes	20%	
Monocytes	3%	
Eosinophil	7%	
Platelets	180	100-400 x 10^ 9/L
Erythrocyte Sedimentation Rate	40	<27(age/2)mm/hour
HBsAg	Non-reactive	Non-reactive
Anti HCV	Non-reactive	Non-reactive
Fasting Blood Sugar	6.4mmol/L	3.5-5.6mmol/L

Parameter	17/11/19	23/11/19	Reference Range
Na	138	142	134-145 mmol/L
K	3.9	3.1	3.5-5.5 mmol/L
CL		123	96-106 mmol/L
HCO3	27	27	21-31 mmol/L
Urea	11.8	4.1	2.5-6.6 mmol/L
Creatinine	177	84	72-122 mmol/L
Uric Acid	770	552	120-420 mmol/L

Following the diagnosis, oral nitrates were discontinued and patient was now placed on bisoprolol tablets. The Cardiothoracic Unit was invited to review.

After evaluating the patient, they continued the ongoing oral medications and due to unavailability of facilities for a Bentall Procedure, discharged the patient from their point of view. Patient was eventually discharged by Cardiology team on oral medications and placed on routine clinic checkup.

DISCUSSION

With the further spread of AIDS worldwide and a dramatic increase in life expectancy of HIV infected patients treated with effective antiviral regimens, an increasing number of patients live with the illness but more than 10% experience cardiovascular manifestations [7].

Before the era of HAART, cardiac manifestations in HIV patients mainly included pancreatitis, cardiomyopathy and pulmonary hypertension leading to heart failure, conduction system, abnormalities, and neoplastic infiltration [8]. In the post-HAART era, acute coronary events by far outnumber all other cardiovascular complications of HIV [7]. Cardiovascular prevention is required in more than one-half of HIV-infected/treated patients for HAART to be reliably effective [7]. As

the prognosis for HIV patients continues to improve, this rate is likely to increase.

This increase has been attributed to ageing along with a resulting increase in risk factors such as hypertension and diabetes, as well as HAART regimens that include stavudine or protease inhibitors (PIs). All medications in this latter class have a reported association with hyperlipidemia, hyperglycemia, and truncal obesity.[9] Atherosclerotic cardiovascular disease has become more frequent with the use of HAART. Studies indicate that new generation PIs such as darunavir/ritonavir[10] and atazanavir/ritonavir[11] are relatively less likely to lead to dyslipidemia.

The integrase inhibitor raltegravir and CCR5 receptor antagonist inhibitor maraviroc have a better lipid and glycemic profile than older PIs and thymidine analogues[12]. In addition, HIV has been found to directly affect vascular biology, resulting in an increased risk of cardiovascular disease compared to uninfected persons[13]. The current patient had received antiretroviral therapy for 16 years (combination regimen is unknown) he developed hypertension (3years ago). The exact cause in this patient is unknown.

The origins of aortic dissection in the current patient appear to be multi-factorial and related to high blood pressure, HIV infection, as well as to the adverse reactions to antiretroviral drugs. Hypertension prevalence in HIV disease was estimated to be 20-25% before the era of HAART but is now up to 74% in patients with HAART-related metabolic syndrome.[14] Lipodystrophy, hypertension and metabolic disorders especially elevated fasting triglycerides are currently thought to be induced by protease inhibitors according to recent reports.[8]

In the current patient, hypertension may have been associated with adverse reactions to antiretroviral therapy and may have been the most significant cause of aortic dissection. Prompt diagnosis and treatment is required in the medical emergency aortic dissection in order to curb morbidity and mortality. A high degree of caution is required for its successful diagnosis as presenting symptoms are so variable that dissection may be overlooked in up to 39% of cases.[15]

Because of the advantage of rapid advances in noninvasive imaging technology that has facilitated the early diagnosis of aortic dissection, it should be considered a differential diagnosis of any patient presenting with chest, abdominal and back pain. Aortic dissection may involve the ascending aorta alone, the descending aorta alone, the descending thoracic and abdominal aorta, or the entire aorta. It is serious because it may rupture, causing life-threatening internal bleeding. Death risk in aortic aneurysm depends on the extent of the dissection with the risk highest in those with dissections of the ascending aorta.

Emergency surgery is the best modality for patients with type-A dissection while optimal medical therapy is appropriate for patients with an uncomplicated type B dissection. The medical treatment of an aortic dissection includes aggressive control of heart rate and blood pressure while the aorta heals. An adequate beta blockade is the cornerstone of medical therapy. Selected patients with aortic dissection type 1 and HIV infection are candidates for surgical repair. One study indicates that perioperative mortality and morbidity rates are high in HIV patients undergoing abdominal aortic surgery.[16]

Major cardiac surgeries do not negatively affect the course of HIV infection and HIV infection itself do not seem to increase perioperative mortality and morbidity.[17] Once the acute dissection has healed, adequate control of blood pressure may eliminate the need for surgery. Patients who survive acute aortic dissection need long-term medical therapy with beta-blockers and appropriate serial imaging follow-up. Once aortic dissection is picked, lifelong monitoring is required because a previously dissected aorta may enlarge and rupture. Because of the nature of the viral infection and the possible mode of viral transmission, many surgeons remain reluctant to perform invasive procedures on patients with HIV infection. Presently, there are no definitive or specific treatment guidelines from different surgical societies regarding surgical treatment of HIV infected patients. The current patient with aortic dissection type 1 did not undergo emergency surgical repair but he received long-term medical therapy with beta-blockers and follow-up.

As the epidemic progresses and new treatments help increase the long-term survival of AIDS patients, cardiovascular complications will become more common. Even though there is now effective treatment for HIV infection with a combination of antiretroviral medications, cardiovascular diseases are still a challenge for

persons infected with HIV.

CONCLUSION

Aortic dissection patients have a high risk of an adverse outcome and need to be managed aggressively in hospital and over the long term with frequent follow-ups. [18]

Future advances in this vein include early detection and optimal treatment of aortic dissection in HIV-infected patients.

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ACUTE STROKE ONSET TO PRESENTATION AND COMPUTED TOMOGRAPHY IN A TERTIARY HOSPITAL, NORTH CENTRAL NIGERIA

Taiwo Yetunde F. (MBBS, FWACS)[1], **Igoh Emmanuel O. (MBBS,FWACS)[1], Gabkwet Anthony E.**(MBBCh,FWACS)[1], **Danjem Samuel M.** (MBBCh,FMCR)[1], **Salaam Abdul J.** (MBBCh,FMCR)[1], **Ani Charles C.** (MBBS,FWACS)[1], **Pam Steven D.** (MBBCh,FWACS)[1], **Akut Daniel** (MBBS,FWACS)[2]

Department(s) and institution(s)

1. Department of Radiology, Faculty of Clinical Sciences, College of Health Sciences. University of Jos / Jos University teaching Hospital.

2. Department of Radiology, Federal Medical Centre, Keffi Nasarawa State, Nigeria.

Corresponding Author: Taiwo Yetunde F. (MBBS, FWACS) Department of Radiology, Faculty of Clinical Sciences, College of Health Sciences. University of Jos / Jos University teaching Hospital. Plateau State, Nigeria. +2348034724264 Email- yetuexj@yahoo.com

ABSTRACT

Background: The burden of stroke is immense. Timely presentation and interventional treatment options have shown promising outcomes in acute stroke patients. This is a luxury that the developing world is yet to see being practiced routinely. Patients need to present early enough for targeted treatment to be instituted, this however, is yet to be achieved in many parts of the developing world.

Objective: To study the duration from acute stroke onset to presentation to the hospital and the time it takes patients to get a brain Computed Tomography (CT) scan with a view to relating it with patient outcome.

Methods: This study was conducted between April 2014 and September 2015 on acute stroke patients that presented at the emergency unit and had CT within one week of ictus. Duration from acute stroke onset to presentationat the hospital and duration from ictus to performing CT scan were noted, this was related with the modified Rankin scale(mRS) assessment outcome. Collected data were analyzed with Statistical Package for Social Sciences (SPSS) version 20.0 and statistical level of significance was set at P 0.05.

Results: One hundred and fifty-three acute stroke patients were observed. Only 2 patients presented less than 3 hours from onset of stroke and no patient had a CT at less than 3 hours from ictus. The relationship between sex of the patient andduration from stroke onset to presentation and duration to CT were significant, while relationship between type of stroke and patient mRS outcome assessment were not significant in both categories of duration.

Conclusion: Majority of acute stroke patients present rather late to the hospital. A lot still needs to be done to improve public education about acute stroke care and the importance of early presentation.

Key Words: Computed Tomography, Modified Rankin Scale, Acute, Stroke, Interventional

INTRODUCTION

Despite advances made in stroke care in more advanced parts of the world, what is obtainable in Nigeria is still sub-optimal with many limiting factors that include prehospital constraints, financial constraints and lack of infrastructure. The 2005 update of the heart disease and stroke statistics update says 700,000 patients have stroke every year and 167,000 die each year with many suffering major disabilityThe use of thrombolytic agents such as intravenous(IV) recombinant tissue plasminogen activator (rt-PA) in acute ischemic stroke is time bound as it hasto be given within 3 hours of stroke onset. Earlier administration of IV rt-PA after stroke onset has been associated with better functional recovery.Studies have tried to look into how quickly patients arrive at the hospital following stroke onset. More advanced parts of the world have better health care systems and we see shorter duration of presentation to the hospital hence thrombolytic therapy can be instituted in patients that are eligible. However, in the less developed world, patients do not have access to good health care, public enlightenment about stroke is still very poor and leaves much to be desired.

This study will be a background for sensitizing health institutions and the public in our setting on quick presentation to the hospital for early evaluation and CT scan to be done since only then can targeted interventional treatmentsbe instituted so the functional recovery of the patients can be better.

Our study aimed to determine the duration from stroke onset to presenting to the hospital and also the timing to having a brain CT with a view to relating it to the type of stroke and also to patient's clinical outcome.

MATERIALS AND METHOD

This study was prospectively conducted at Jos University Teaching Hospital from April 2014 to September 2015. Approval was obtained from the Research and Ethical Committee of the institution with reference number (JUTH/DCS/ADM/127/XIX/5905 21st March 2014). Written informed consent was obtained from all the subjects or their legal representatives.

Subjects aged 18 years with acute stroke history of less than seven days were included in the study. Patients presenting with a repeat stroke or patients having causes of focal neurologic deficit other than stroke or stroke-like syndromes after CT had been done were excluded.

Subjects who met the inclusion criteria were recruited consecutively by the lead author.

All scans were done using a made in USA Four (4) slice General Electric (Bright speed) series CT scanner year 2006/07, model number XG001G-JS-001-GAN using the standard protocol for head scan.

Information about the time of onset of symptoms and presentation to the hospital was gotten from the patients folder as reviewed by the on-call neurologist while the time between onset of symptoms and carrying out the CT scan was extrapolated using CT console record showingthe exact time and date the CT was done.

A follow up of each patient's case note was done to get the 30-day outcome. The outcome was defined using the modified Rankin scale (mRS), a functional outcome assessment scale used to assess disabilitywith scores ranging between 0to 6, where 0; No symptom at all, 1; No significant disability despite symptoms; able to carry out all usual duties and activities, 2; Slight disability; unable to carry out all previous activities, but able to look after own affairs without assistance, 3; Moderate disability, requiring some help, but able to walk without assistance, 4; Moderately severe disability; unable to walk without assistance unable to attend to own bodily needs without assistance, 5;Severe disability; bedridden, incontinent and requiring constant nursing care and attention and 6; Dead.We defined good outcomes as mRS score of 0 through 3.

Frequency distribution and percentages for duration (in hours) were done. Likewise, the mean and standard deviation of these durations were measured. Chi-square for categorical values and correlations were used as appropriate. The collected data were analyzed with Statistical Package for Social Sciences (SPSS) version 20.0 (Microsoft® Inc. Chicago, Illinois, USA. 2011). The statistical level of significance was set at P 0.05.

RESULTS

One hundred and fifty-three acute stroke patients comprising of 75(49%) females. Age range of 18-90 years with mean age±standard deviation(SD) of

57.97±14.21 years. One hundred and nine (71.2%) had ischemic stroke while 44(28.8%) were hemorrhagic stroke patients.

The mean duration from onset of symptoms to presentation at the hospital was 52.7±46.4 hrs. Minimum and maximum duration before presentation to the hospital post stroke were 1 and 144 hours respectively. Only 2 patients (1.3%) presented less than 3 hours post ictus while57 patients making up 37.3% presented after two days from onset of acute stroke symptoms (table I).

Table I: Distribution of Patients By Duration(hours) Between Onset of Symptoms and Presentation To The Hospital

Time	Frequency(f)	Percentage (%)	Mean±SD.
< 3 hours	2	1.3	52.7±46.4 hrs.
3 - 6 hours	17	11.1	
7 - 12 hours	27	17.6	
13 - 24 hours	27	17.6	
25 - 48 hours	23	15.0	
> 2 days	57	37.3	

(Total = 153) SD= Standard Deviation

No patient presented less 3 hours between onset of symptom and CT scan. Minimum and maximum duration post ictus before CT scan were 5 and 168 hours respectively. More than half of the patients(52.3%) presented for CT scan after 2 days. Mean presentation time between onset of symptoms and CT scan was 69.3±49.0 hours (Table II).

Table II: Distribution of patients by duration(hours) between onset of symptoms and CT scan

Time	Frequency	Percentage (%)	Mean±SD.
< 3 hours	0	0.0	69.3±49.0 hrs.
3 - 6 hours	2	1.3	
7 - 12 hours	11	7.2	
13 - 24 hours	30	19.6	
25 - 48 hours	30	19.6	
> 2 days	80	52.3	

(Total = 153) SD= Standard Deviation

More female patients (49.3%) presented less than 24 hours from onset of symptom. On the other hand, more male patients (43.6%) presented ˃2 days from the onset of symptom. This was statistically significant (*P*=0.017) (Table III).

Table III: Relationship between sex distribution and time between onset of symptoms and presentation to the hospital

Time	Sex			Chi-square	*P*value
	Male N (%)	Females N (%)	Total N (%)		
< 24 hours	21(26.9)	37(49.3)	58(37.9)	8.165	0.017
24 - 48 hours	23(29.5)	15(20.0)	38(24.8)		
> 2 days	34(43.6)	23(30.7)	57(37.3)		

P = 0.017 N=Number %=Percentage

There was no significant relationship between the type of stroke and the duration between onset of symptoms and presentation. However, more ischemic stroke patients presented less than 24 hours from onset of symptom (P=0.446) (Table IV).

Table IV: Relationship between type of stroke andtime between onset of symptoms and presentation to the hospital

Time	Types of stroke			Chi-square	*P*value
	Ischemic N (%)	Hemorrhagic N (%)	Total N (%)		
< 24 hours	43(39.4)	15(34.1)	58(37.9)	1.615	0.446
24 - 48 hours	24(22.0)	14(31.8)	38(24.8)		
> 2 days	42(38.5)	15(34.1)	57(37.3)		
Total	109(71.2)	44(28.8)	153(100)		

P = 0.446 N=Number %=Percentage

The relationship between clinical outcome and time from stroke onset to presentation wasnot statistically significant (P=0.480)(Table V).

Table V: Relationship between outcome assessment and time between onset of symptoms and presentation

Time	Outcome			Chi-square	*P*value
	Favorable N (%)	Unfavorable N (%)	Total N (%)		
< 24 hours	15(42.9)	43(36.4)	58(37.9)	1.467	0.480
24 - 48 hours	6(17.1)	32(27.1)	38(24.8)		
> 2 days	14(40.0)	43(36.4)	57(37.3)		

P = 0.480 N= Number (%)=Percentage

Favorable outcome mRS 0-3, Unfavorable outcome mRS 4-6

Majority (64.1%) of the male patients presented 2 days post ictus for CT scan. Similarly, of the female patients that presented for CT scan, 40.0% presented 2 days after onset of stroke symptoms. More females than males had CT at less than 24 hours post stroke. There was a statistically significant difference between sex and time to CT scan (P=0.001) (Table VI).

Table VI: Sex distribution of patients by time between onset of symptoms and CT scan

Time	Sex			Chi-square	*P* value
	Male N (%)	Females N (%)	Total N (%)		
< 24 hours	9(11.5)	28(37.3)	37(24.2)	14.815	0.001
24 - 48 hours	19(24.4)	17(22.7)	36(23.5)		
> 2 days	50(64.1)	30(40.0)	80(52.3)		

P = 0.001 N= Number (%)=Percentage

The relationship between the type of stroke and duration from onset of symptoms and CT scan was not significant (*P*=0.078) as more patients were seen to present for CT scan more than 2 days post stroke insult. (Table VII)

Table VII: Relationship between type of stroke and time between onset of symptoms and CT scan

Time	Types of stroke			Chi-square	*P*-value
	Ischemic N (%)	Hemorrhagic N (%)	TotalN (%)		
< 24 hours	25(22.9)	12(27.3)	37(24.2)	5.102	0.078
24 - 48 hours	31(28.4)	5(11.4)	36(23.5)		
> 2 days	53(48.6)	27(61.4)	80(52.3)		

P =0.078 N= Number (%)=Percentage

A non-significant relationship was seen between patient mRS outcome and the time between onset of stroke symptoms and CT scan. (*P*=0.725) (Table VIII).

Table VIII: Relationship between outcome assessment and time between onset of symptoms and CT scan

Time	Outcome mRS			Chi-square	*P* value
	Favorable N (%)	Unfavorable N (%)	TotalN (%)		
< 24 hours	8(22.9)	29(24.6)	37(24.2)	0.643	0.725
24 - 48 hours	10(28.6)	26(22.0)	36(23.5)		
> 2 days	17(48.6)	63(53.4)	80(52.3)		

P =0.725 N= Number (%)=Percentage

Favorable outcome mRS 0-3, Unfavorable outcome mRS 4-6

DISCUSSION

Timely diagnosis of patients with acute stroke is key to instituting the correct treatment option if a favourable patient outcome is to be obtained. Most patients on our study were observed to have had their CT scan done at more than 2days after stroke onset which is what is obtainable in most developing countries and in many parts of Nigeria. The mean duration from stroke onset to presentation in JUTH was 52.7 hours and the mean duration from stroke onset to getting the brain CT scan was 69.3 hours, this is similar to what was observed in the study by Ogbole et al in Ibadan where the mean time to CT scan was 70 hours.This however differs from other climes where median time to presentation could be as low as 2 - 3.5 hours.A study carried out in our centeryears before the CT was installed found that more than 50% of acute stroke patients presented to the hospital after 3 hours but before 24 hours.Our study however, revealed that the earliest patient presented to the hospital at1 hour post stroke and only 2(1.3%)patients presented in <3hours, 11.1% in 3-6hoursand majority(37.3%)presented more than 2days post stroke.This is in sharp contrast to what is seen in more advances cities where between 48% and 77% of patients present much earlier to the hospital.A study found 21% of patients presented in 1 hour, 52% in 4 hours and 76% in 24 hours.

Even though 2 patients presented to the hospital at less than 3 hours post ictus, none of the patients had a CT within the 3-hour window. The earliest duration from ictus to CT scan was 5hours, only 2(1.3%) of the patients had CT in the time range 3-6hours with majority (52.3%) having CT at more than 2 days post ictus. This contrasts with other studies in more advanced parts of the world where 35.5% of patients had CT in within 3 hours and 53%

in less than 6 hours.In more developed parts of the world where a lot is being done to access good health care within the shortest possible time, patients present much earlier to the hospital in addition to the quick response to emergency cases. Studies reviewing the time taken for suspected acute stroke patients to get a brain CT from the moment they present at the emergency department have been carried out in more advanced countries with a view to making it as short as possible.Kalnins et al. attempted to achieve quality improvements in stroke care geared towards shortening"Stroke Code"to CT. "Stroke Code"wasdefined as a multistep process that involves many people from multiple departments who must perform assigned roles in a highly coordinated way to consistently achieve minimal times.Theirstudy showed duration from presentation to CT was shortened from over 20 minutes to less than 14 minutes.This is commendable, as patients get tailored treatment much sooner compared to a situation where an acute ischemic stroke patient that could benefit from thrombolytic treatment doesn't get this life saving treatment because of delays that include presenting late to the hospital, administrative bottlenecks within the hospital and financial constraints to getting a CT done. Some patients may even present to the hospital in the subacute or chronic stage of stroke when the window period for thrombolytic therapy has already elapsed. American stroke association recommendsthat acute ischemic stroke patients have recombinant tissue plasminogen activator (rt-PA) administered within 3 hours and no later than 4.5 hours of stroke onset. This is still a far cry from what is obtainable in our center and in most parts of Nigeria. Studies have however found that patients have shown significant functional recovery following rt-PA treatment in acute ischemic stroke.

This study found more females present to the hospital earlier than males, this is at variance with other studies done in Nigeria and other parts of the wold.This may reflect a better health seeking attitude by women due to education and better financial status in this part of Nigeria. Women are known to play key roles in the family in some cultures and as such receive better care and attention from family members.

The type of stroke did not relate significantly with the time of presentation to the hospital nor to the duration before CT was done, this is at variance with other studies where patients with hemorrhagic stroke present much earlier.This may be because in this environment, many factors come into play in determining how soon patients present. A poor knowledge of the disease condition and the essence of urgency is not understood bymajority of the population. There is also delay in decision making on how to handle these patients since finances play a major role in the ability to access health care in Nigeria. Majority of the population pay for health services out of their pockets and poverty is prominent in this environment. Patients and their relatives may resort to alternative medical treatment which is prominent and viewed to be a much cheaperoption in this part of the world. Worthy of note is the fact that not all patients that present to the hospitalget a CT due to lack of money to pay for the CT.The causes of delays in the hospital range from infrastructural decay to lack of steady power supply, break down of hospital equipments and lack of urgency in the attitude to work by hospital staff.

The relationship between patient clinical assessment outcome and duration from stroke onset to presentation to the hospital or duration before CT were not significant. This may be because of delay in presentation and hence delay in starting appropriate care. None of the ischemic stroke patients in this study got rt-PA and the hemorrhagic stroke patients were managed without any intracranial surgical intervention.

Our shortcomings in this study include the possibility of getting inaccurate timings due to the inability to tell exactly when the symptoms started in patients found to have a stroke upon waking up in the morning or poor knowledge of the patients clinical condition by a relative who wasn't present at the onset of stroke but called upon to take charge of patient care.

A better understanding of the factors leading to delayed presentation to the hospital is a necessity if early presentation is to be achieved. The need for public enlightenment about acute stroke is further revealed by our study. More hospitals must be equipped with modern imaging modalities in the diagnosis of acute stroke such as CT and Magnetic Resonance Imaging(MRI) to make accessibility much easier and faster for patients from the rural areas. Equipping hospitals with "Stroke Units" and retraining of health workers on the reduction of

delays in the diagnosis and institution of early treatment options will further add to the care of stroke patients in Nigeria. Making health care accessible for all citizens will form a basis for improved care in the nation.

CONCLUSION

Our study has shown that majority of patients do not present to the hospital early. Much more needs to be done for patients to present early and CT scan to be done within the shortest possible time for interventional treatments to be considered. Measures geared toward shortening the duration of stroke onset to presentation and having CT should be seriously put in place.

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MALARIA IN PREGNANCY: PREGNANT WOMEN'S SATISFACTION WITH QUALITY OF SERVICES IN PUBLIC AND PRIVATE HEALTH FACILITIES IN IBADAN

Oluwaseun Oladapo Akinyemi,[a] (ooakinyemi@comui.edu.ng, seunakinyemi@hotmail.com)
Eugenia Nneka Emelieze[a] (gniagnius@gmail.com)
Oluwatomi Owopetu[b] (oluwatomifunbi@gmail.com)

[a] Department of Health Policy and Management, College of Medicine, University of Ibadan, Ibadan, Nigeria
[b] Department of Community Medicine, University College Hospital, Ibadan, Nigeria

Corresponding Author: Dr Oluwaseun O. Akinyemi
Department of Health Policy and Management, College of Medicine, University of Ibadan, Ibadan, Nigeria+234 803 502 0136

ABSTRACT

Introduction

Effective treatment is a vital strategy in malaria control and management. This study assessed the satisfaction of pregnant women to malaria in pregnancy (MIP) care and also compared the quality of MIPservices in private and public healthcare facilities in Ibadan, Southwest Nigeria.

Methodology

This was a comparative cross-sectional study using mixed methods. A semi-structured interviewer-administered questionnaire was used to obtain information on satisfaction with malaria in pregnancy services from 320 pregnant women selected by simple random sampling from those attending antenatal clinics in private and public sectors. Also, with the aid of an interview guide, key informant interviews were conducted with purposively-selected healthcare providers to assess the management of MIP. A checklist was similarly used to assess the health facilities. Predictors of respondents' satisfaction were assessed using the Chi-Square test and binary logistic regression. All analyses were performed at a statistical significance level of $\alpha_{0.05}$.

Results

The pregnant women were aged 17 to 44 years with a mean age of 29.5 ± 4.8 years. About two-thirds of the women were graduates. Respondents' mean gestational age, gravidity and median parity was 6.6 ± 1.8 months, 2.0 ± 1.2, and 2.0 (range 1.0–9.0), respectively. Most educated women preferred the private health facilities. However, about 62.5% of the women were not satisfied with the overall maternal care services inboth the public and private health facilities. Respondents in the private health facilities (40.0%)were more satisfied than those in the public health facilities (35.0%). The overall respondents' satisfaction with malaria care in pregnancy was poor. Multiple logistic regression revealed that the Independent predictors of respondent's overall satisfaction were level of facility (AOR=6.4, 95%CI=1.7, 24.0) and parity (AOR=2.7, 95% CI=140.5.13. Qualitative findings show high awareness and familiarity as well as adherence to the malaria control policy among health workers in both private and public health sectors. Observational checklists revealed better facilities and services in private facilities compared to public health infrastructures.

Conclusion

The private healthcare facilities were rated as providing better services and satisfaction than the public facilities for malaria care among pregnant women. Government needs to put in more effort in improving services in public healthcare facilities.

Keywords: Antenatal care, Satisfaction with healthcare services, Malaria in pregnancy, Congenital malaria, Private health facility, Public health facility

Introduction

Malaria is transmitted through the bites of Anopheles mosquitoes, but less known to many in various communities is that it can also be spread to children during pregnancy as well as before and/or during childbirth. Malaria contracted at this time is called congenital malaria and is a cause of infant death and low birth weight. [1-3] A child dies every minute from malaria in Africa where it is estimated that 9 out of 10 malaria deaths occur.[4] In 2013, there were 528,000 deaths from malaria and about 78% of these were in children under 5 years of age[5]. Governments of malaria-endemic countries contributed 28% of total funding (US $ 900 million) in 2017, a figure unchanged from 2016. Two-thirds of domestically sourced funds were invested in malaria control activities carried out by national malaria programs (NMPs), with the remaining share estimated as the cost of patient care.[4]

Of the estimated 50 million pregnancies that occur each year globally, approximately 25 million is thought to occur in developing countries. Pregnant women and children are thought to be the most vulnerable to malaria. Whereas several initiatives have been implemented over the years to control malaria in pregnancy, none of these has succeeded in its entirety. Without any intervention, malaria would cause 10, 000 of these women and 200, 000 of their infant's death as a result of malaria infection and severe malarial anemia.[5]

In malaria-endemic areas like Nigeria, the World Health Organization (WHO) recommends targeting high-risk groups such as pregnant women and young children with chemoprevention strategies. Approximately 15 million pregnant women remain vulnerable due to limited access to preventive treatments for malaria.[5] More so, the WHO recommends intermittent preventive treatment in pregnancy (IPTp) with the antimalarial drug sulfadoxine-pyrimethamine. Among the 33 African countries that reported on IPTp coverage levels in 2017, an estimated 22% of eligible pregnant women received the recommended 3 or more doses of IPTp, compared with 17% in 2015 and 0% in 2010.[4]

In Nigeria, antenatal care (ANC) utilization rate is still low. About 61% of pregnant women visited a skilled provider at least once during their pregnancy compared with the documented average of 79% for all lower-middle-income countries.[6] ANC enables effective management of pre-natal morbidities and may enablefacility delivery and postpartum care, thereby improving maternal and new-born health outcomes.[7-9] In Nigeria, 41% of women who utilized skilled ANC did not deliver in a healthcare facility. [7-10] Studies suggest that dissatisfaction with the ANC experience may partly explain this low level of facility delivery by ANC users. Policies to maximize patient satisfaction at ANC visits may translate into sustained ANC use throughout the pregnancy and increased rates of health facility delivery. The role of health facility and staff characteristics in general outpatients' satisfaction with care is well documented. These include facility infrastructure and amenities availability (equipment, drugs, comfortable waiting area), interpersonal interactions of staff and providers (e.g. courtesy, empathy), providers' technical performance, care logistics and the absence of financial barriers to care.[11-14]

Healthcare can be provided through public and private providers. Public healthcare is usually provided by the government through national healthcare systems.[15] Private sector healthcare delivery in low- and middle-income countries is sometimes argued to be more efficient, accountable, and sustainable than public sector delivery.[14-16] Conversely, the public sector is often regarded as providing more equitable and evidence-based care. [15] This study, therefore, investigated the quality of malaria in pregnancy care received at different private and public health facilities in Ibadan, Nigeria.

Methods

Study Design

This is a comparative cross-sectional study using mixed methods carried out in public and private facilities in Ibadan using questionnaires, interview guides, and a checklist to assess the quality of Malaria in Pregnancy (MIP) services in Nigeria.

Study Area

The study was conducted in Ibadan, Oyo State. Ibadan is the ancient capital of Oyo State, Southwest Nigeria with a landmass of 27,249 square kilometers and a population of about 5.5 million according to the National Population census of 2006. Oyo State has 33 local government areas (LGAs) with Ibadan being the capital and the

administrative headquarters of the state. Ibadan is an industrial city and a center for trade and farming, producing cocoa, palm oil, yams, cassava, corn, and fruits. The inhabitants are mainly Yoruba. Forty-nine percent of the total population is female. Of this, 51 percent are in their reproductive ages.[17] Ibadan has 240 public maternal health care facilities out of which 231 (96%) are primary healthcare facilities, 7(2.92%) are secondary facilities and 2 (0.83%) are tertiary maternal health care facilities.[18]

Study Population and Sampling Technique

The study population was conducted among patients and health care providers in private and public health facilities. They were selected as care recipients and care providers respectively.Three hundred and twenty pregnant women participated in the questionnaire survey.

Both public and private health facilities were selected purposively. Three primary and one secondary facilities were sampled to represent private facilities while for the public facilities, 14 primary and one secondary facilities were sampled. The public facilities included one facility each from tertiary, secondary, and primary levels. The private facilities included one urban, suburban, and rural locations respectively. These facilities were chosen by balloting from the prior selection. The pregnant women were selected using simple random sampling from those attending antenatal clinics. Total sampling was done for all available health care providers such as doctors, nurses, pharmacists.Pregnant women coming for ANC visits as well as healthcare workers were included in the study. However, individuals that were too ill to participate in the study were excluded.

Data collection tool

The instrument for data collection was the SERVQUAL Model questionnaire. The questionnaire had sections that covered Sociodemographic characteristics and then the domains of quality and satisfaction: Expectations, Perceptions, Responsiveness, and Empathy.

The SERVQUAL Model questionnaire has the following dimensions:1) Tangibles-physical facilities, equipment, the appearance of personnel and communication materials.2) Reliability-the ability of the service provider to perform the promised service responsibly and accurately.3) Responsiveness-the willingness of employees to help and provide prompt service to customers.4) Assurance-the knowledge, courtesy, and competence of employees and their ability to inspire trust and confidence in the customer towards the service provider.5) Empathy-the caring, individualized, and personalized attention provided to customers.The SERVQUAL scale contained 22 pairs of items spanning across five dimensions coveringkey issues of service quality.

It comprises two sets of similar statements: the first is acustomer expectations measure (E) and the second is a measure of customers' perceptions as tothe actual service delivered by the provider (P).

The instrument measures the quality as thedifference between expectations and perceptions (E-P). A five-point Likert scale was used tomeasure the patients' expectations and perceptions of service quality.

Key Informant Interviews (KIIs) to appraise and compare the adequacy of the facility structure for the management of malaria in pregnancy in private and public health sectors in Oyo state were done using interview guides. The tools were pretested outside the study area in two facilities one public, and the other private and ambiguous questions were refined.

Data Analysis

Data were analyzed using SPSS version 10 and results presented using appropriate frequency and summary measures, charts, and graphs. Patient satisfaction was computed as the difference between a patient's perception and expectation about the available healthcare services under each dimension assessed.Qualitative data were analyzed with the aid of NVIVO version 10 using a thematic framework approach.

Ethical considerations

Ethical approval was obtained from the Oyo State Ministry of Health Research Ethics Review Committee before the commencement of the study. Written informed consent was obtained from each respondent.

Confidentiality

All forms of personal identifiers such as names were not used; rather, numerical codes were used as identifiers. Also, data from the study were used for researchpurposes only. The data were stored in a password-secured folder on one of the researchers' computer.

Results

A. Quantitative results

The respondents were between the ages of 17 to 44 years and their mean age was 29.5± 4.8 years. Most of the women were highly educated, as about two-thirds of them were graduates or postgraduates. Most of the women were Yoruba (88.8%) as shown in Table 1. About 36.3% of the women were skilled professionals. Of the 320 women interviewed, 160 respondents (50.0%) attended a public healthcare facility while the remaining 160 respondents (50.0%) attended a private healthcare facility as seen in Table 2. Twenty-one respondents (6.6%) were in their first trimester. Moreover, 106 respondents(33.1%)were in their second trimester. while 193 respondents(60.3%) were in their third trimester. One hundred and forty-four respondents (45.0%)were primigravidae while the remaining 176 respondents(55.0%) were multigravida as seen in Table 2 Also, 35.0% were traders, 19.4% were artisans while 9.4% were unemployed.

Nearly three-quarters of the respondents with lower educational levels (i.e. primary and secondary) attended a public healthcare facility while more than half of respondents with higher educational levels (i.e. graduate and post-graduate) patronized private healthcare facilities. Most respondents aged 35 years and above preferred the private health facilities while those aged 24 years and below preferred the public facilities.

Most of the respondents (62.5%) were not satisfied with the overall maternal healthcare services. However, further analysis of the service quality scale revealed that most respondents were satisfied with the five domains. About 52.5%, 60.0%, 62.2%, 67.5%, 64.1% of the respondents were satisfied with the tangible, reliability, responsiveness, assurance, and empathy dimensions, respectively.

Table 1: Socio-demographic Characteristics of Respondents

Socio-demographic Characteristics	Frequency	Percentage (%)
Age (years)		
≤ 24	55	17.2
25-29	103	32.2
30-34	108	33.8
≥35	54	16.9
Mean	**29.5 ±4.8**	
Level of education		
Lower	111	34.7
Higher	209	65.3
Ethnicity		
Yoruba	284	88.8
Igbo	21	6.6
Others	15	4.7
Marital status		
Never married	5	1.6
Currently married	312	97.5
Widowed	2	0.6
Divorced	1	0.3
Type of Marriage		
Monogamy	299	93.4
Polygamy	21	6.6
Religion		
Christianity	167	52.2
Islam	153	47.8
Occupation		
Professionals	116	36.3
Traders	112	35.0
Artisan	62	19.4
Unemployed	30	9.4
Average Monthly Income (₦)		
< ₦20,000	110	34.4
₦ 20,000 – ₦50,000	146	45.6
>₦ 50,000	64	20.0

Lower Education = Primary and Secondary. Higher Education = Graduate and Post-graduate

Table 2: Clinical Characteristics of Respondents

Clinical Characteristics	Frequency (n)	Percentage (%)
Type of facility		
Public	160	50.0
Private	160	50.0
Level of facility		
Primary	15	4.7
Secondary	305	95.3
Gestational age		
1st Trimester	21	6.6
2nd Trimester	106	33.1
3rd Trimester	193	60.3
Mean±SD	6.6 ±1.8	
Gravidity		
Primigravida	144	45.0
Multigravida	176	55.0
Mean±SD	2.0±1.2	
Parity		
Nulliparous	126	39.4
Primiparous	83	25.9
Multiparous	111	34.7
Mean±SD	1.2±1.3	

Women receiving healthcare in private health facilities had a greater proportion of satisfied respondents (40.0%) than their counterparts using public health facilities (35.0%). Respondents who received health services in primary health facilities (80.0%) recorded greater satisfaction than their counterparts (35.4%) who patronized secondary health facilities ($p<0.05$). Women in their third trimester were the most satisfied among their counterparts (42.5%), while respondents in their first trimester were the least satisfied (28.6%). Moreover, multiparous respondents were the most satisfied of their group (45.9%) and primiparous respondents (27.7%) the least ($p<0.05$) (See Table 3).

Table 3: Association Between Overall Satisfaction and Socio-demographic Characteristics

Variables	Overall Satisfaction		X^2	df	P-value
	No	Yes			
Age (years)					
≤ 24	35 (63.6)	20 (36.4)			
25-29	60 (58.3)	43 (41.7)	3.09	3	0.378
30-34	74 (68.5)	34 (31.5)			
≥ 35	31 (57.4)	23 (42.6)			
Level of education					
Lower	68 (61.3)	43 (38.7)	0.11	1	0.739
Higher	132 (63.2)	77 (36.8)			
Ethnicity					
Yoruba	181 (63.7)	103 (36.3)			
Igbo	12 (57.1)	9 (42.9)	2.05	2	0.360
Others	7 (46.7)	8 (53.3)			
Type of Marriage					
Monogamy	185 (61.9)	114 (38.1)	0.76	1	0.382
Polygamy	15 (71.4)	6 (28.6)			
Religion					
Christianity	114 (68.3)	53 (31.7)	4.95	1	0.026*
Islam	86 (56.2)	67 (43.8)			
Occupation					
Professional	83 (71.6)	33 (28.4)			
Traders	57 (50.9)	55 (49.1)	12.03	3	0.007*
Artisan	38 (61.3)	24 (38.7)			
Unemployed	22 (73.3)	8 (26.7)			
Average Monthly Income (₦)					
< 20,000	66 (60.0)	44 (40.0)			
20,000 – 50,000	92 (63.0)	54 (37.0)	0.58	2	0.750
> 50,000	42 (65.6)	22 (34.4)			

* = statistical significance ($p<0.05$)

In Table 4, participants receiving healthcare in private health facilities had a greater proportion of satisfied respondents (40.0%) than their counterparts using public health facilities (35.0%). Respondents who received health services in primary health facilities (80.0%) recorded greater satisfaction than their counterparts (35.4%) who patronized secondary health facilities ($p<0.05$). Women in their third trimester were the most satisfied among their counterparts (42.5%), while respondents in their first trimester were the least satisfied (28.6%). Moreover, multiparous respondents were the most satisfied of their group (45.9%) and primiparous respondents (27.7%) the least ($p<0.05$).There was no significant association between age, level of education, ethnicity, type of marriage, religion, and monthly income with the respondent's satisfaction with the tangible, reliability ($p<0.05$) responsiveness ($p<0.05$) and empathy satisfaction dimensions($p<0.05$)

Table 4: Association between the Overall Satisfactions with the Clinical Characteristics

Variables	Overall Satisfaction		X^2	df	P-value
	No	Yes			
Types of facility					
Public	104 (65.0)	56 (35.0)	0.85	1	0.356
Private	96 (60.0)	64 (40.0)			
Level of facility					
Primary	3 (20.0)	12 (80.0)	12.13	1	0.000*
Secondary	197 (64.6)	108 (35.4)			
Gestational Age (months)					
1st Trimester	15 (71.4)	6 (28.6)			
2nd Trimester	74 (69.8)	32 (30.2)	5.18	2	0.075
3rd Trimester	111 (57.5)	82 (42.5)			
Parity					
Nullipara	80 (63.5)	46 (36.5)			
Primipara	60 (72.3)	23 (27.7)	6.83	2	0.033*
Multipara	60 (54.1)	51 (45.9)			
Gravidity					
Primigravida	89 (61.8)	55 (38.2)	0.05	1	0.816
Multigravida	111 (63.1)	65 (36.9)			

* = statistical significance ($p<0.05$)

Regression analysis of overall satisfaction of respondents to healthcare services in their various centers showed, after adjusting for confounding, that respondents who used primary health care facilities (AOR=6.4, 95% CI=1.71,23.99) were 6 times more likely to be satisfied with services received than their counterparts patronizing secondary healthcare centers ($p<0.05$), while multiparous respondents (AOR=2.7, 95% CI=1.40, 5.13) were about 3 times more likely to be satisfied than primiparous women ($p<0.05$). See details in Table 5.

Table 5 Binary Logistic Regression of Factors Associated Overall Satisfaction with Maternal Healthcare Service

Variables	AOR	95% CI (AOR)		P-value
		Lower	Upper	
Religion				
Christianity	0.69	0.43	1.13	0.139
Islam (Ref.)	1			
Occupation				
Professional	0.90	0.36	2.29	0.827
Traders	2.19	0.87	5.52	0.095
Artisan	1.55	0.58	4.14	0.381
Unemployed (Ref.)	1			
Level of facility				
Primary	6.41	1.71	23.99	0.006*
Secondary (Ref.)	1			
Parity				
Nullipara	1.77	0.94	3.36	0.079
Primipara (Ref.)	1			
Multipara	2.68	1.40	5.13	0.003*

* = statistical significance ($p<0.05$)

After adjusting for confounding, the regression analysis of the tangible satisfaction of respondents tohealthcare services showed that women who were traders (AOR=2.5, 95% CI=1.06,5.90) had two times higher odds of having tangible satisfaction compared to other occupations. Moreover, respondents who patronized primary healthcare centres (AOR=5.5, 95% CI= 1.20,5.53) had five times higher odds of gaining tangible satisfaction than their counterparts attending secondary health facilities. Adjusting for confounding in the regression analysis of reliability satisfaction of healthcare services by respondents' multiparous women (AOR= 2.1, 95% CI =1.13,3.80) were two times more likely to have reliability satisfaction than their nulliparous and primiparous co-respondents. Attendees of the primary health facilities were 4.6 times more likely than those in the secondary health facilities to be satisfied with the reliability satisfaction dimension (AOR=4.6, 95% CI=0.99, 21.05). Concerning the analysis of responsiveness satisfaction to healthcare service after adjusting for confounding, respondents in their 2nd trimester (AOR = 2.9, 95% CI =1.10, 8.11) and those in their 3rd trimester (AOR= 3.6, 95% CI = 1.32, 9.73 were both 2 times and 3 times more likely to have responsiveness satisfaction than those in their first trimester. Furthermore, multiparous women (AOR =2.4, 95% CI=1.24, 4.58) were two times more likely to express responsiveness satisfaction than their nulliparous and primiparous counterparts.

A. Qualitative results

Nineteen KIIs were conducted among 5 doctors, 12 nurses, 1 Community Health Officer (CHO), and 1 Community Health Extension Workers (CHEW). Of the 19 healthcare workers, 6 were males while 13 were females. Fifteen were from private health while 4 were from the public health facilities. All the doctors were males while 11 out of the 12 nurses sampled were females (Table 6).

Table 6: Socio-demographic characteristics of the Key Informant Interview Participants (N = 19)

Healthcare Workers	Sex		Health Facility		Total
	Male	Female	Private	Public	
Medical Doctors	5	0	4	1	5
Nurses	1	11	0	12	12
CHO	0	1	0	1	1
CHEW	0	1	0	1	1
Total	**6**	**13**	**4**	**15**	**19**

CHO = Community Health Officer. CHEW = Community Health Extension Worker

Most of the respondents were aware of the malaria control policy. The majority of the respondents were conversant with the malaria control policy. There was no difference in the awareness and familiarity with the malaria control policy between health workers in the private and public facilities. This is illustrated by the following quotes:

> *··· They are policies given by WHO, we are given, we have a booklet, a handbook on malaria treatment but it is almost everybody that must have known the policy··· at least I have the idea* (Nurse, Public).
>
> *Malaria control policies are strategies that are put in place to bring down the scourge of* malaria··· (Doctor, Private).

Control of malaria during pregnancy

Respondents described different ways of preventing and treating malaria during pregnancy. Most respondents suggested the use of chemotherapy for prophylaxis and prevention using insecticide-treated nets.

> *··· We give them prophylaxis and active anti-malaria, depending on the patient, maybe every week, then if they come with malaria and they breakdown and we do some test and they are tested of malaria we give them combination therapy* (Doctor, Private).
>
> *We run a test, using Rapid kit for malaria*

and then give them the necessary tablet most especially, we use ACT (Doctor, Private).

We are using mosquito nets, and we are encouraging the people to use the mosquito nets, and to avoid stagnant water and to be cutting their bush around the house, then they should use door nets (CHO. Public).

We give LLINs for the pregnant mother that come to book for the first time, and after 16 weeks of gestational age, we give them the SP (Sulfadoxine-pyrimethamine). for *prevention of malaria, 4 weeks interval we still give them the second one, and 4-week interval we give them the third one. And we counsel them to net all the windows and doors at home, and to make sure we counsel them on environmental sanitation, and they should clear bush around the house, drain the gutters, removal of broken bottles and damaged tires. To prevent stagnant water from producing mosquito* (Nurse. Public).

Drugs Available for Malaria Treatment

Respondents described the various drugs available *in their health facilities for the treatment of malaria, mostly artemisinin-based* medication. Both oral and intramural routes are used.

I give them quinine, Fansidar® and combination therapy (*Doctor, Private*)

We give them artemether-lumefantrine given to us (by government). If we don't *have the one given by the government, we ask them to go and buy it (Nurse, Public).*

··· *Arthermeter lumefantrine and artemether injection (Doctor, Private)*

··· *Coartem*® . ACT (artemisinin-based combination therapy) and SP (Sulfadoxine-*pyrimethamine) (Nurse, Public)*

Measures taken when Rapid Diagnostic Tests is negative

Most respondents complied with the malaria treatment guidelines by stating that a pregnant woman that tests negative with RDT does not imply that she is free from malaria. Some healthcare workers sampled suggested that the pregnant woman still goes for further laboratory tests like the microscopic test for malaria and a Widal test for typhoid fever. Others suggested that they will continue with prophylaxis whether the women test negative or positive to RDT. Some responses are shown below:

Well, I just ··· give them prophylaxis (Doctor, Private)

We still give them (malaria treatment). treat them for 5, 6, 7 months with SP (Sulfadoxine-pyrimethamine) (*Doctor, Private*)

If the test is negative, then I will, if and she complains and it is related to malaria, maybe she has a body temperature and another complain, we will refer the patient to have widal test, whether she has typhoid (CHEW. Public)

··· *It depends on other complaints, it* may not be malaria. so you know. supposing pregnant women are complaining about headaches. we will treat her based on what she is complaining of. sometimes we can tell them to go and do microscopy test outside (*Nurse, Public*)

··· *At times, the RDT may be negative and the person still have malaria, we won't say because she's negative, we won't treat her and at the time, we need to be very careful with the use of RDT, at times the RDT may have expired, so it will be given you the wrong result (Nurse, Public)*

Checklist results

Using the checklist, a comparison of the available and functional basic amenities revealed that private health facilities had better surroundings, waiting areas, toilets facilities than the public facilities.All the health facilities studied had stethoscopes and sphygmomanometer. All the private health facilities sampled had refrigerators for the storage of drugs compared with their counterparts in the public health facilities. Most of the private and public health facilities sampled had written guidelines for the treatment of malaria in pregnancy. Also, the private health facilities had more personal protective equipment, disinfectants, and sterilization equipment compared with the public health facilities. Besides. more private health facilities had laboratories within their premises and available drugs compared to public health facilities. These findings are shown in Figures 1 and 2.

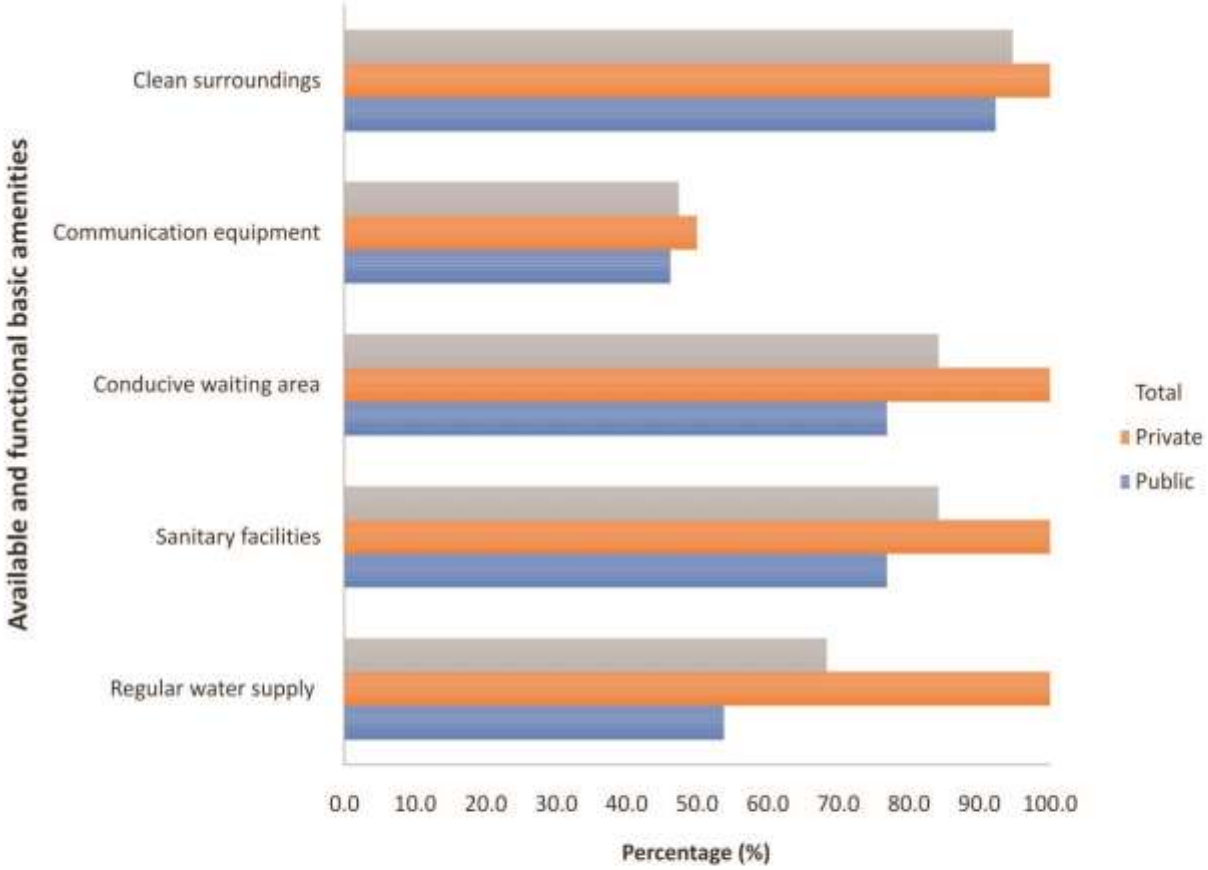

Figure 1: Comparison of available and functional basic amenities between public and private facilities

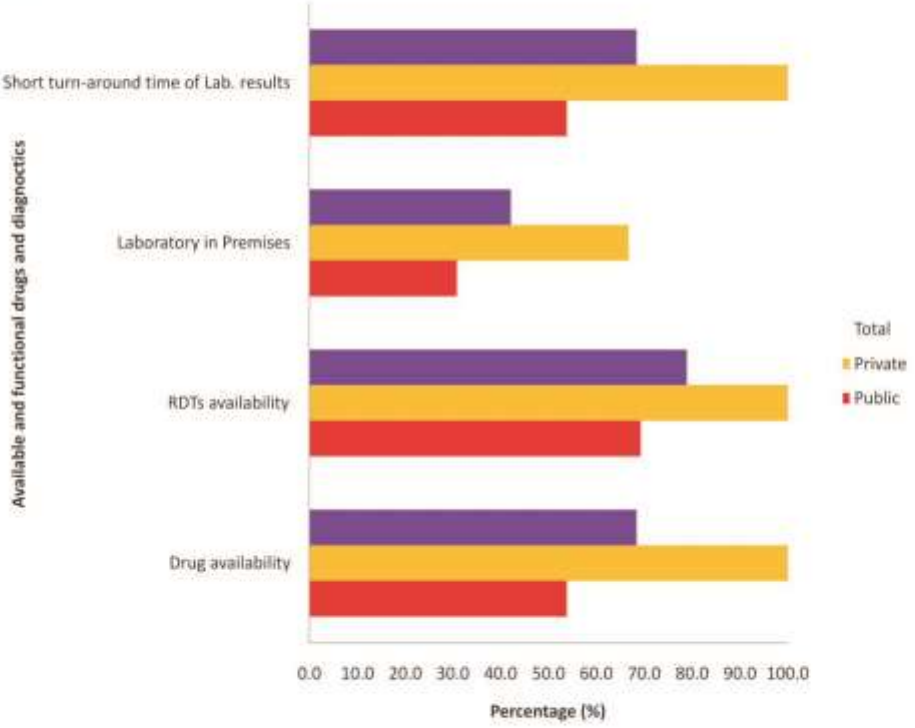

Figure 2: Comparison of available and functional malaria drugs and diagnostics between facilities

Discussion

This comparative cross-sectional study was conducted among pregnant women in private and public healthcare facilities as well as healthcare providers in selected health care facilities in Ibadan, Nigeria. This study's questionnaire respondents were women of the reproductive age group. In a similar study in Ilorin, Nigeria, women attending antenatal care services in four selected private health were aged between15– 45 years.[19] Compared to this study's respondents, a lower mean age of 25.2± 5.1 years was found among women attending antenatal care clinics in a Cameroonian study. [20] The present study revealed that a small proportion of the respondents were in their first trimester. Similar observations were made in Nigeria,[21-23] Cameroon, [20] Ethiopia[24-25] Myanmar, [26] and Malawi.[27] Late booking for antenatal care may be due to poverty, ignorance, or misconception of the essence and appropriate time for commencement of antenatal care.[22,28]The majority of the respondents were graduates. This finding agrees with the report of Bello and colleagues[29] from a study done among women attending antenatal care in Ibadan, Nigeria. However, some studies [20, 30, 31] revealed that a low level of education among pregnant women might be the reason for the late initiation of antenatal care. This finding suggests that an improvement in maternal literacy and empowerment is an important panacea for maternal mortality in developing countries.[28] This is also in line with the report of some authors among pregnant women in public and private health facilities in Northern Ethiopia and Sudan, respectively.[32,33] The majority of the respondents in both health sectors were not satisfied with the malaria in pregnancy services received in both the private and public health facilities. In contrast to this finding, most women were satisfied with the antenatal care services received in private health facilities in Ilorin. [19] Similarly, most of the pregnant women in a health facility in South Western Ethiopia were satisfied with the ANC services they received.[34] Furthermore, authors[20, 30] from Kenya Namibia and Cameroon revealed that the majority of the pregnant women were satisfied with the antenatal care services they received. The present study also revealed that nearly all the pregnant women attending antenatal care services in a secondary and tertiary health facility in Ibadan, Nigeria were satisfied with the healthcare services they received. [23,9] Aplausible reason for the overall low level of satisfaction expressed by pregnant women in this study may be because patient satisfaction was computed as the difference between a patient's perception and expectation about the available healthcare services. Hence, respondents expected higher quality healthcare services from the public hospitals which are funded by the governmentthan the private hospital that is funded by individuals.

Also, the pregnant women attending private health facilities seem more satisfied with the malariaservices received than those attending the public health facilities. This finding is consistent with the result of a cross-sectional comparative study which reported that pregnant women in private health facilities in Lagos, Nigeria were more satisfied with the antenatal care services they received than those in the public health facilities.[14] The result of this study also agrees with findings from several studies that assessed general patients' satisfaction for healthcare services received in private and public health facilities in Nigeria,[25] Ghana,[36] Thailand,[37] Pakistan,[38] Bangladeshi,[39] Iran,[40] Poland[41] and Sudan,[33] Conversely, a systematic review of the comparative performance of private and public health care systems in developing countries argued that although, the private healthcare sector had better timeliness and hospitality to patients but they often violate medical standards of practice and had poor patient outcomes.[15]

However, this study, like any other cross-sectional study, has some limitations in that causal inferences cannot be made.

Conclusion

Respondents were not satisfied with the overall maternal healthcare services in the sampled health facilities. They however were more satisfied with the services of the private health facilities. The private health facilities had a more adequate structure for the management of malaria in pregnancy than the public facilities. It appeared that the private facilities provided better services and satisfaction than the public facilities. The government needs to put in more effort in improving services in public facilities.

Conflict of interest

The authors declare there are no conflicts of interest.

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LEFT VENTRICULAR NONCOMPACTION IN NIGERIAN CHILDREN: CASE SERIES AND REVIEW OF LITERATURE

Iember T Ajanaku[1], Amina O Jibril[2]

[1]Paediatric Cardiology Unit, Department of Paediatrics, University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria

[2]Neonatology Unit, Department of Paediatrics, University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria

Abstract

Left ventricular noncompaction (LVNC) is an uncommon cardiomyopathy characterized by multiple prominent trabeculations in the ventricular wall, deep intratrabecular recesses which communicate directly with the left ventricular cavity, and thin compacted layer of myocardium, caused by in utero arrest of normal myocardial compaction. The clinical presentation and course may be benign or may manifest more aggressively with impaired left ventricular function, arrhythmias, and embolism, resulting in poor outcomes. Diagnosis requires a high index of suspicion and is established primarily by echocardiograph; treatment is symptomatic, determined by the mode of presentation and the presence or absence of complications. This case series describes clinical and echocardiographic features in twelve (12) children with LVNC at a tertiary hospital in Gwagwalada, Nigeria.

Keywords: left ventricular cardiomyopathy, children, ventricular dysfunction, echocardiography

INTRODUCTION

Left ventricular noncompaction (LVNC) is an uncommon cardiomyopathy which is increasingly being reported in all age groups.[1] It is characterized by multiple prominent trabeculations in the ventricular wall, deep intratrabecular recesses which communicate directly with the left ventricular cavity, and thin compacted layer of myocardium,[2] resulting from an intrauterine arrest of normal myocardial compaction during embryogenesis.[3] LVNC can present as an isolated form, or in association with other cardiomyopathies, congenital heart diseases, and complex syndromes which affect the heart.[4-9]

LVNC may remain asymptomatic for years, or may present with symptoms of congestive cardiac failure (CCF) and left ventricular (LV) systolic and/or diastolic dysfunction, arrhythmias, thromboembolic events, and sudden death, at any age.[9,10] Cardiac imaging is required to make a diagnosis of LVNC,[11] using echocardiography[12] and/or cardiac magnetic resonance (CMR).[13]

This case series describes clinical and echocardiographic features in twelve (12) children with LVNC who presented to the Paediatric Cardiology Unit of the Department of Paediatrics, University of Abuja Teaching Hospital (UATH), Gwagwalada, Nigeria, between April 2014 and December 2019.

CASE SUMMARIES

Twelve paediatric age patients were diagnosed with LVNC between April 2014 and December 2019. Clinical information on the patients' demographics, clinical presentation, other relevant investigations, and follow up status was extracted from their medical records. Echocardiographic data was retrieved from the database of the University of Abuja Teaching Hospital non-invasive cardiac laboratory and reviewed. Transthoracic Echocardiography (TTE) was performed for all 12 patients using a GE Vivid e portable ultrasound machine. None had cardiac magnetic resonance imaging, due to its non-availability at our centre.

A diagnosis of LVNC was established in the presence of these criteria: (1) the presence of multiple echocardiographic trabeculations, (2) multiple deep intertrabecular recesses communicating with the ventricular cavity, as demonstrated by color Doppler imaging and the recesses demonstrated in the apical or midventricular areas of both the inferior and lateral walls, and (3) a 2-layered structure of the endocardium with a noncompacted-to-compacted ratio greater than 1.4 in children (N:C > 1.4).[10,14]

The patients ranged in age from 5 months to 17 years, 8 were adolescents. Seven were males and 5 females, male to female ratio 1.4:1.

Table I summarises the clinical presentation and follow up status of the patients. Two patients were asymptomatic and referred for screening. Another was referred following insertion of a Glenn shunt for congenitally corrected transposition of the great arteries (CCTGA), while awaiting definitive surgery. Eight patients presented with symptoms of congestive cardiac failure. Only 6 patients (50%) were regular with follow up visits, while 2 died within 1 and 2 years post-diagnosis, respectively.

Table II shows findings from echocardiography and other investigations. All 12 patients had N:C > 2.0, range 2.1 to 4.7, although N:C > 1.4 was applied for diagnosis.[13] LV dysfunction of varying severity was present in 8 patients. Of these, 5 had both systolic and diastolic dysfunction, 1 had systolic dysfunction, while 2 had diastolic dysfunction. All 8 had dilated cardiac chambers and valvular regurgitation.

Three patients had isolated LVNC, while other cardiomyopathies were diagnosed in 3, with dilated cardiomyopathy (DCM) and HIV-associated cardiomyopathy diagnosed in 2 and 1, respectively. Congenital heart defects were present in 3: aortic stenosis (AS) secondary to bicuspid aortic valve in 1, AS secondary to dysplastic aortic valve in another, and congenitally corrected transposition of the great arteries in the 3rd. And 2 had features consistent with acute rheumatic fever (ARF).

The patients who were symptomatic and in congestive cardiac failure received antifailure medication which included beta blockers, ACE inhibitors, diuretics, and digoxin, as well as low dose aspirin, as indicated. In addition, those with acute rheumatic fever were treated with anti-inflammatory medication (aspirin and prednisolone as indicated) and antibiotics, and commenced on secondary prophylaxis with intramuscular benzathine penicillin G.

Table 1: Demographic data, clinical features, Ross score, and follow up status of children with LVNC

Serial number	Age at diagnosis	Gender	Presenting symptoms	Ross class (Modified Ross score[15])	Follow up/ outcome
1	13 years	Male	Recurrent palpitations, cough, oedema	IV	Lost to follow up after 1year
2	12 years	Female	Fever, abdominal pain, cough, vomiting, bilateral knee swelling	III	Irregular, deceased in 2nd year of follow up
3	14 years	Male	Cough, fast breathing, chest pain, fever, history of sore throat	IV	Regular over 3 years
4	5 months	Male	Referred for screening for m ultiple congenital anomalies (macroglossia, omphalocoele major)	I	Returned to referring centre, lost to follow up
5	8 years	Male	Weight loss, fever, cough, fast breathing	IV	Regular over 3 years
6	18 months	Female	Follow up post -Glenn shunt insertion in CCTGA	I	Lost to follow up after 6 months
7	4 years	Male	Fast breathing, easy fatigability, precordial bulge	II	Regular over 3 years.
8	11 years	Male	Cough, fast breathing, oedema	IV	Regular over 2 years
9	14 years	Female	Cough, fast breathing, oedema	IV	Regular over 1 year
10	12 years	Female	Weight loss, fever, cough, fast breathing, oedema	IV	Irregular, deceased within 1 year
11	7 years	Female	Cough, fast breathing, oedema	III	Irregular over 1 year
12	17 years	Male	Incidental finding of cardiac murmur	I	Regular over 6 months

CCTGA indicates congenitally corrected transposition of the great arteries; LVNC, left ventricular noncompaction cardiomyopathy

Table II: Noncompacted to compacted ratio, systolic and diastolic function, other abnormal echocardiographic abnormalities, and significant findings from other investigations of children with LVNC

Serial number	N/C ratio	Systolic function	Diastolic function	Other abnormal echo findings {Additional diagnosis}	Significant findings from other investigations
1	3.5:1	Impaired (EF=23%)	Impaired (E/A=6.0)	Dilated LA and LV, MR, TR, PR {DCM}	CXR-cardiomegaly with b iventricular configuration and obliteration of cardiophrenic and costophrenic angles
2	2.8:1	Normal (EF=66%)	Impaired (E/A=3.14)	Dilated LA and LV, prolapsed AML, MR, AR, PR {ARF}	ECG-LAE, LVH; CXR-cardiomegaly; elevated ESR ; leucocytosis, lymphocytosis, anaemia; elevated ASO titre ; *Streptococcus* spp isolated from pharynx
3	3.7:1	Impaired (EF=46%)	Normal (E/A=1.7)	Dilated LA and LV, thickened MV, poor coaptation and prolapse of AML, ruptured chordae tendinae, MR, TR, AR, PR {ARF}	ECG-Prolonged PR interval, RV conduction delay ; CXR-cardiomegaly with biventricular configuration: elevated ASO titre
4	4.1:1	Normal (EF=65%)	Normal (E/A=1.5)	Nil	Nil
5	4.7:1	Impaired (EF=39%)	Impaired (E/A=2.96)	Dilated RA, LA, RV and LV, bicuspid aortic valve, aortic stenosis, MR, TR, PR, RV dysf unction (TAPSE=13.4mm), pericardial effusion {Congenital AS}	Nil

6	2.1:1	Normal (EF=57%)	Normal (E/A=1.2)	Ventriculoarterial and arterioventricular discordance, ventricular inversion, dilated RA and RV, large VSD, secundum ASD, stenosed MPA, MR, TR, spongy RV myocardium, good functioning Glenn conduit {CCTGA with Glenn shunt}	Nil
7	2.3:1	Normal (EF=60%)	Impaired (E/A=2.2)	Dilated LA, LV hypertrophy, dysplastic aortic valve with valvular, subvalvular and supravalvular stenosis, dilated ascending aorta and transverse arch, dilated coronaries , AR {Congenital AS}	Nil
8	2.8:1	Impaired (EF=30%)	Impaired (E/A=5.2)	Dilated LA and LV, hypokinetic septal and lateral wall motion, MR {DCM}	Nil
9	2.5:1	Impaired (EF=14%)	Impaired (E/A=2.4)	Dilated LA and LV, MR, TR {DCM}	Nil
10	2.7:1	Impaired (EF=42%)	Impaired (E/A=2.1)	Dilated LA and LV, MR, TR {HIV cardiomyopathy}	Positive for HIV antibodies
11	2.8:1	Normal (EF=68%)	Normal (E/A=1.8)	Dilated LA and LV , MR	Nil
12	2.1:1	Normal (EF=67%)	Normal (E/A=1.7)	Nil	Nil

AML indicates anterior mitral leaflet; AR, aortic regurgitation; ARF, acute rheumatic fever; AS, aortic stenosis; ASD, atrial septal defect; ASO titre, antistreptolysin O titre; CCTGA, congenitally corrected transposition of the great arteries; CXR, chest radiograph; DCM, dilated cardiomyopathy; E/A, ratio of peak velocity blood flow in early diastole to peak velocity flow in late diastole; ECG, electrocardiogram; EF, ejection fraction; ESR, erythrocyte sedimentation rate; LA, left atrium; LAE, left atrial enlargement; LV, left ventricle; LVNC, left ventricular noncompaction cardiomyopathy; LVH, left ventricular hypertrophy; MPA, main pulmonary artery; MR, mitral regurgitation; MV, mitral valve; N/C, noncompacted to compacted ratio; PR, pulmonary regurgitation; PR interval, time from onset of atrial depolarization to onset of ventricular depolarization; RA, right atrium; RV, right ventricle; TAPSE, tricuspid annular plane systolic excursion; TR, tricuspid regurgitation; VSD, ventricular septal defect.

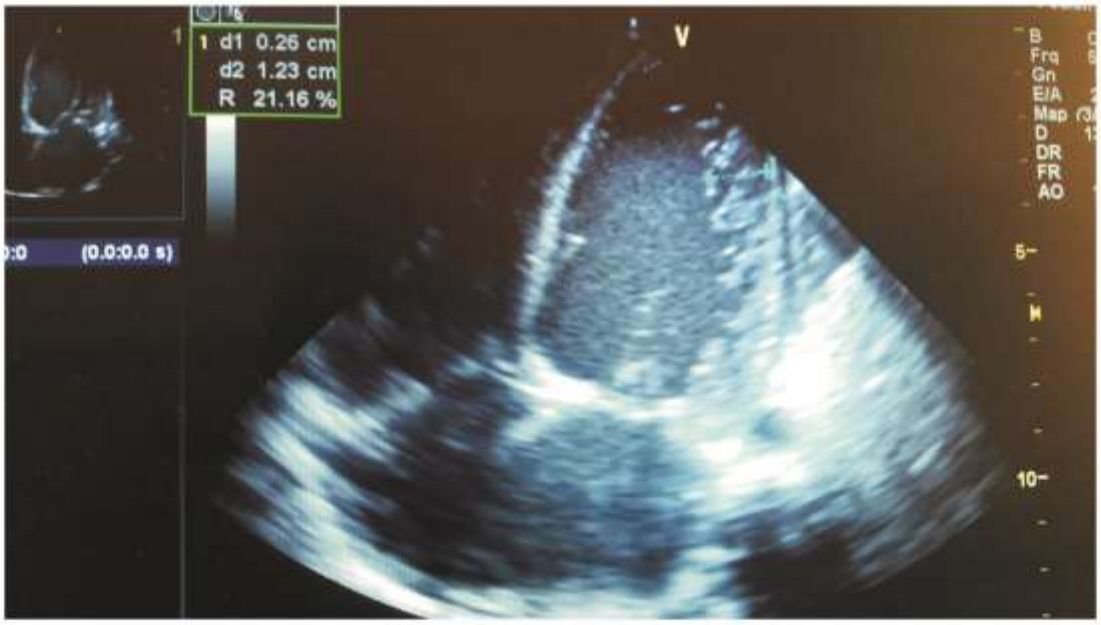

Figure 1: Apical 4-chamber transthoracic echocardiographic image of patient with LVNC demonstrating prominent ventricular trabeculations and deep intertrabecular recesses predominately in the apical and lateral walls. Original clinical image from UATH non-invasive cardiac laboratory.

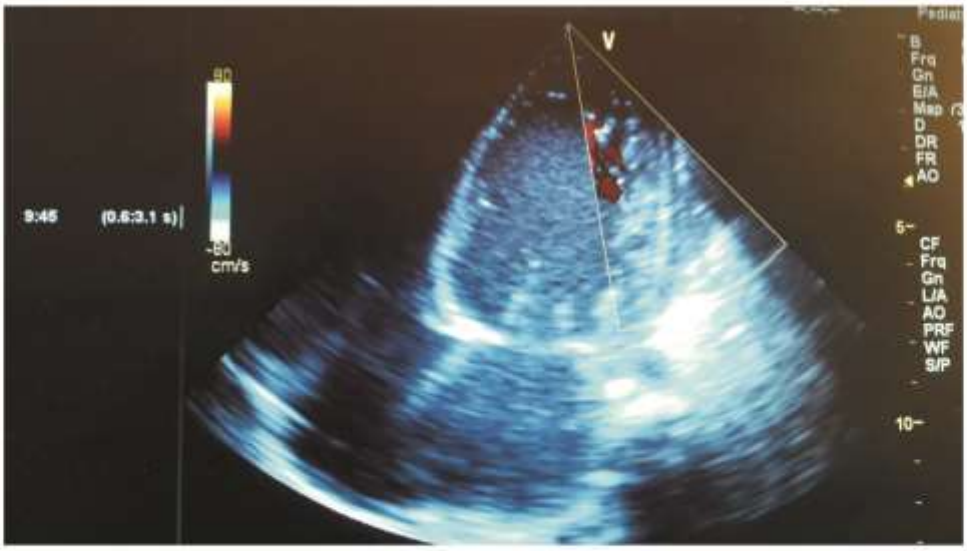

Figure 2: Apical 4-chamber echocardiographic view of same patient with color Doppler demonstrating communication of intertrabecular recesses with the ventricular cavity. Original clinical image from UATH non-invasive cardiac laboratory.

DISCUSSION

There has been an upsurge in the documentation and characterization of LVNC in adults and children over the last 2 decades.[1,10,16] Earlier reports showed a preponderance in paediatric age groups,[5] with subsequent reports describing LVNC in adults.[9,11] LVNC occurs in 0.81 per 100,000 infants per year with 0.12 cases per 100,000 children per year, and has a prevalence of 0.014% to 1.3% in patients referred for echocardiography.[7,9,10,16]

The World Health Organisation as well as the European Society of Cardiology list LVNC as an unclassified cardiomyopathy.[17] However, the American Heart Association classifies it as a genetic cardiomyopathy, which may be familial or sporadic.[6] Various genes have been described in the familial form of the disease, including mutations in G4.5 gene on Xq28 (14) cardiac specific CSX gene disrupting the TAZ protein leading to dysregulated remodeling of cardiolipin and Barth syndrome, characterized by hypertrabeculation and noncompaction in utero and failure to thrive, as well as specific mutations in genes in the Notch1 pathway leading to dysregulated signaling and hyper trabeculation and noncompaction.[4,18]

LVNC may exist in the isolated form which is not associated with other cardiac anomalies; or may be non-isolated associated with other cardiomyopathies, complex syndromes, and congenital heart defects such as coronary artery anomalies, conotruncal anomalies (absence of the pulmonary valve, pulmonary atresia, tricuspid atresia), Ebstein anomaly, transposition of the great arteries, pulmonic stenosis, ventricular septal defect, atrial septal defect, and hypoplastic heart syndrome; abnormalities of the left ventricular outflow tract and valve anomalies are common probably due to abnormalities in ventricular development.[4-10,11,19] Similarly, both the isolated form of LVNC and LVNC associated with other cardiac anomalies were demonstrated in our patients. Majority of the patients reviewed had LVNC in association with other cardiac pathologies, which is a frequent occurrence in children.

Clinical presentation of LVNC is nonspecific and wide,[20,21] and is dependent on the form of LVNC, whether isolated or in association with CHD, syndromes or other diseases, the age of the patient, or whether asymptomatic patients are diagnosed during family or other screening.[16] Clinical symptoms at presentation are frequently indicative of ventricular dysfunction and include nonspecific chest pain or discomfort, symptoms of congestive cardiac failure, failure, or arrhythmias.[9,11] LV systolic dysfunction is the most common finding in both children and adults (up to two thirds of patients) and depends on the extent of noncompacted cardiac segments;[11,19] cardiac failure is present in more than 50% of patients.[16] This protean presentation of LVNC was also evident in our patients, ranging from asymptomatic to congestive cardiac failure with marked impairment of ventricular function, and is consistent with published literature. In patients with advanced disease, progressive deterioration in cardiac function occurs, which may result in the development of fatal complications such as thromboembolic events, arrhythmias, and sudden cardiac death.[19,20] The poor outcome associated with the disease may explain the 2 mortalities documented in our patients, likely worsened by poor treatment compliance occasioned by irregular follow up care.

ECG findings may be normal or nonspecific,[10,19] and include marked biventricular hypertrophy with extreme QRS voltage, isolated or diffuse T-wave inversion, ventricular and supraventricular tachycardia, Wolff-Parkinson-White syndrome (WPW), and premature atrial and ventricular contractions.[10] The presence of ECG abnormalities does not correlate with the extent of LVNC.[11] Our patients also presented with this variation in ECG findings, from normal findings to ventricular hypertrophy and conduction delay, some of which could have been caused by coexisting cardiac pathologies as well.

Cardiac imaging is the mainstay of the diagnosis of LVNC,[11,12,13] and is based on the finding of thickened myocardium with a two-layered structure consisting of a thin, compacted epicardial layer and a much thicker, noncompacted endocardial layer.[11] 2D transthoracic echocardiography is the first choice for diagnosis, and demonstrates both broad trabeculae and deep intertrabecular recesses in the LV myocardium, typically located in the LV apex and the midinferior and lateral walls.[4] Conversely, the basal and midinterventricular septum scanned

by an apical 4-chamber view is usually free of trabeculae .[4] It may be necessary to also utilise atypical views and contrast for better visualization of the more apical segments of the LV and detection of the prominent trabeculae.[4]

Several criteria have been established for the diagnosis of LVNC using echocardiography. The most commonly used is that described by Jenni *et al*[11], viz (a) two-layered appearance of the myocardium with a thin, compacted outer (epicardial) band and a thicker, noncompacted inner (endocardial) layer, end-systolic ratio between noncompacted and compacted myocardium greater than 2.0 in adults and 1.4 in children, (b) presence of prominent left ventricular trabeculations, predominantly in the apical and midventricular areas of both the inferior and lateral walls, (c) multiple deep intertrabecular recesses communicating with the ventricular cavity, as visualized at color Doppler imaging, and (d) absence of additional coexisting cardiac abnormalities (in the presence of isolated LVNC).[14,16] The echocardiographic diagnosis of LVNC in our patients was consistent with this criteria. None of our patients had other imaging modalities such as CMR and computed tomography (CT) imaging which may be utilised for enhanced localisation and morphological description of the myocardium,[16] more so as these were not available at our centre.

There are no specific management guidelines for LVNC.[4,16] In isolated LVNC, differential diagnoses such as prominent hypertrabeculation with normal compacted LV layer, apical HCM, DCM, endocardial fibroelastosis, and LV apical thrombus must be excluded. Asymptomatic patients with normal LV size and function require regular clinical monitoring. Treatment is directed at the phenotype and presence or absence of the main complications of heart failure, arrhythmias and thromboembolism.[4] Systolic and diastolic dysfunction can be managed with beta blockers, ACE inhibitors, diuretics, and digoxin, as indicated; heart transplant is indicated in patients who develop refractory heart failure.[20] Institution of oral anticoagulants should be individualized to patients' needs; either for primary prevention of embolic events based on the phenotype or in the presence of chamber enlargement, LV dysfunction, arrhythmias, prior embolic events, or proven atrial or ventricular thrombi.[4,16] These treatment modalities were instituted in our patients in whom the above-listed indications were present. The risk for sudden cardiac death and arrhythmias may require annual Holter monitoring; electrophysiologic studies and anti-arrhythmic therapies may also be indicated in patients who are symptomatic.[4] Echocardiographic screening should be performed in 1st degree relatives, as well as screening for neuromuscular disorders due to association of LVNC with non-cardiac disorders.[9,22] The severity and progression of heart failure, presence of arrhythmias and thromboembolism determine the prognosis of patients with LVNC. Some patients may remain asymptomatic, while others may develop symptoms early, with rapid deterioration terminating in death soon after diagnosis.[20] Paediatric patients may demonstrate an "undulating phenotype" with recovery in systolic ventricular function for a variable period of time before deteriorating further, which may account for many patients presenting as adults.[10] ECG abnormalities are prominent, however, systemic embolic events are not.[10] The occurrence of embolic events, ventricular arrhythmias and sudden death appears to be significantly lower in paediatric patients.[10]

CONCLUSION

This case series documents the occurrence of this rare cardiomyopathy in Nigerian children presenting to our hospital. LVNC is a disease of increasing clinical importance, impacting significantly on cardiac function and long term survival of affected individuals. A high index of suspicion and sound diagnostic techniques are important to ensure early diagnosis, treatment, prevention of life-threatening complications, and improvement in the quality of life of patients. The renewed interest and awareness occasioned by previous and ongoing research should be sustained to yield better understanding of the disease and the possible development of specific management modalities towards achieving improved outcomes.

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KNOWLEDGE OF CERVICAL CANCER, PAPANICOLAOU SMEAR AND ITS UTILIZATION AMONG FEMALE UNDERGRADUATES IN A MEDIA COLLEGE IN JOS, PLATEAU STATE

Ferdinand Chidozie Obi[1],Sandra Umejiaku,[2],Harrison Obinna Egboh[3], Makshwar Kahansim[4]
[1]Department of Obstetrics and Gynaecology, Jos University Teaching Hospital and Our Lady of Apostles Hospital, Jos, Plateau State
[2]Department of Family Medicine, Dalhatu Araf Specialist Hospital, Lafia, Nassarawa State.
[3]Department of Obstetrics and Gynaecology, Jos University Teaching Hospital, Jos, Plateau State.
[4]Department of Obstetrics and Gynaecology, Jos University Teaching Hospital, Jos, Plateau State
Corresponding author: Ferdinand Chidozie Obi, Department of Obstetrics and Gynecology, Our Lady of Apostles Hospital, Jos, Plateau State. dozzy212@yahoo.com

Abstract

Background: Cervical cancer is a largely preventable disease. In western countries, the incidence of and mortality associated with cervical cancer has reduced substantially following the introduction of effective cervical screening programmes. This is in contrast to what is obtained in Africa including Nigeria where cervical screening is rudimentary or non- existent.

Aim: This study seeks to assess the knowledge of cervical cancer, papanicolaou smear and its utilization among undergraduate students in Nigeria Television Authority College, Jos, Plateau state.

Methods: the study was adescriptive, cross sectional, questionnaire based study in which a systematic random sampling technique was used to recruit the desired sample population, and these recruited participants were administered the questionnaire which was used for data collection. The questions were made to capture the objectives of the study.

Results: Most of the respondents 267 (65%) were aware of cervical cancer, 134 (30.2%) respondents knew that HPV was an important aetiological factor, while only 118 (28.7%) were aware of papanicolaou smear. 207 (50.4%) knew that cervical cancer begins as abnormal cervical changes. Only 63 (15.3%) of the respondents had carried out a pap smear.

Conclusion: The study conducted shows that the knowledge of cervical cancer, papanicolaou smear and itsutilization among the study population is still generally low.

INTRODUCTION

Carcinoma of the cervix is a major public health problem throughout the world. It is the second most common malignancy in women worldwide. However, it is the most common cancer in women in the third world,where over three quarters of the estimated half a million newly diagnosed cases occur annually.[1,2] Cervical cancer is the leading cause of mortality among women worldwide.[3] WHO estimates that the contribution of cervical cancer to adult female death is 35%.[4] However, it is also the most preventable type of human cancer because of its slow progression, identifiable precursors and effective treatments[5].

The rates of cervical cancer in developed countries are 5 per 100,000 women compared with 25 per 100 000 women in low resource countries. The high mortality rates are due to the advanced stage at presentation, affected women being unable to complete therapy, lack of available treatment, and unaffordable therapy.[6] It accounts for approximately 300,000 deaths annually worldwide and half a million new cases are reported each year.[7] Approximately, 80% of these new cases come from

developing countries where the disease is also the leading cause of cancer related deaths among women.[8] In Nigeria, the national incidence of cervical cancer is 250/100 000.[9] Oguntayo et al (2011) reported that cervical cancer was the leading cause of gynecological cancers in Northern Nigeria, accounting for 65.7% of all gynecological cancers.[10] This high incidence was also observed in Ibadan and Maiduguri 62.7%and 72.6% respectively.[11] In Kano, Illorin, Jos, Benin and Zaria, it accounted for 59.2%, 60%, 74%, 74.6%, and 77% respectively.[12-14]

Data from Ghana, Kenya and Zimbabwe shows that it accounted for 57.8%, 70-80% and 80% of gynecological cancers respectively.[15] In developed countries the incidence of the disease has decreased over the years because of well organized cervical screening programmes.[15, 16] In Canada and the USA it accounted for 2.4% and 1.5% of new cases and 1.4% and 1.3% of cancer related deaths.[15]

The known primary underlying cause is the human papilloma virus (HPV), which is the most common sexually transmitted infection worldwide, and it is estimated that 50% to 80% of sexually active women are infected at least once in their lifetime.[17] Cervical cancer is caused mainly by infection with certain strains of human papilloma virus (HPV), that infects the epithelial cells of the cervix uteri and can result in precancerous lesions and invasive cancer. Currently, over 120 different HPV types have been identified, of which at least 38 primarily infect the genitalia. Four high risk types (HPV-16, 18, 31 and 45) account for about 80% of invasive cancer of the cervix collected from around the world.[17]

Many risk factors have been implicated, they include early age at first sexual intercourse, early marriage, high parity, multiple male sexual partners, male sexual partners who have had multiple sexual partners, early age at first birth, smoking, familial predisposition, long use of oral contraceptive pills, low social class, immune-suppressed state and commoner in the black race.[16,18] Most of these are associated with increase exposure to HPV. Evidence is emerging that HIV/AIDS accelerates the transformation of pre-malignant disease to invasive disease. HPV is more prevalent in women who are HIV sero-positive than those who are sero-negative.[18]

In a study conducted among 200 women in Aba, South-East Nigeria to determine the level of cervical cancer awareness, the prevalence of major risk factors and their rate of utilization of Pap smear, overall knowledge of cervical cancer was low and only 16% had any knowledge of Pap smear.[19]A cross-sectional descriptive survey carried out among 483 randomly selected market women at Aleshinloye market revealed that only 40.8% were aware of cervical cancer while 19.7% were aware of Pap smear. However, only 5.2% had had previous Pap smear.[1] In another cross-sectional survey, on cervical cancer risks, knowledge of Pap smear and utilization among female undergraduates at Ibadan. It revealed that the risk factors were prevalent among female undergraduates. About 71% were aware of cervical cancer while only 33.5% were aware of Pap smear. Awareness was better among students of college of medicine and married ones. Only 8.3% had ever done a Pap smear.[19]At the JUTH a study to determine if there is improvement in the awareness and utilization of Pap smear among female health workers and to determine the possible role of the gynecologists. About 93.5% affirmed to the knowledge of Pap smear. On further scrutiny, 56.5% knew what it actually was. It was 49.7% among nurses, 50% among pharmacist while 96.4% of doctors had knowledge about Pap smear.[21]

At least one third of all cancer cases are preventable and another one third permits the early detection and effective treatment. Early detection and diagnosis can then greatly increases the chances for successful treatment particularly relevant for common female cancer like Cancer cervix[22].

METHOD

STUDY AREA

The study was conducted in the Nigeria Television Authority College which is located in Jos, Plateau state, North Central Nigeria.

INCLUSION AND EXCLUSION CRITERIA

The study population comprised all female students of the NTA College Jos, Plateau state. All male students and the staff of the NTA College were excluded.

STUDY DESIGN

This descriptive cross-sectional study was conducted among female undergraduates of the NTA College Jos, Plateau state in the month of February 2015.

SAMPLING METHOD

A systematic random sampling technique was used to recruit the desired sample size.

DATA COLLECTION INSTRUMENT

The survey instrument was a self-administered questionnaire containing open ended and closed-ended questions on respondent's biodata, awareness about cervical cancer and screening practices. Pre-testing of the questionnaire was done among 20 students before the final questionnaire was developed. The questionnaire was used to obtain information on the socio-demographic characteristics of the respondents, knowledge about cervical cancer, papanicolaou smear and its utilization. The questionnaire was administered to a total of 422 participants. Respondents were given a free hand in response to questions and were only guided in their responses when they voluntarily called for help. They were also assured that the information provided would be kept confidential.

Sample size determination

The minimum sample size for the study was obtained using the formula:

$n = p \times (1-p) \times (Z^2/d)^2$. This is same as $n = Z^2pq/d^2$

where Z= standard deviation at 95% confidence interval = 1.96

p = prevalence/ proportion of students with knowledge about cervical cancer and its screening .since there are no studies regarding this topic in the study area p is taken as 50%

q = 1-p,

p= Prevalence of 50%

d= Desired degree of accuracy; here taken to be 0.05

$$\text{Sample size (n)} = \frac{(1.96)^2 \times 0.50\,(1-0.50)}{0.05 \times 0.05}$$

$$n = \frac{3.84 \times 0.50 \times 0.50}{0.0025} = \frac{0.96}{0.0025}$$

$= 384$

The sample size, was adjusted to compensate for an attrition rate of 10%

Therefore 10% of 384 = 38.

Minimum sample size = 384 + 38 = 422

Sample size of 422 was chosen

11 questionnaires were not properly filled, therefore a total of 411 questionnaires were analyzed.

The data collected were analyzed using the SPSS statistical package version 16.0 (SPSS Inc, Chicago, IL).

RESULTS

TABLE 1: Socio-demographic characteristics of female students interviewed at NTA College (n=411)

Table 1a

Variables	Frequency (n)	Percentages (%)
Age (years)		
15-20	196	47.7%
21-25	152	37%
26-30	33	8%
31-35	23	5.6%
36-40	5	1.2%
40-45	2	0.5%

From table 1a students aged between the ages of 15-25 make up 84.7% of the respondents. This reflects a youthful and educationally driven group

Table 1b

Variables	Frequency (n)	Percentages (%)
Marital status		
Single	343	83.5%
Married	64	15.6%
Separated	2	0.5%
Widowed	2	0.5%

Table 1c

Variable	Frequency (n)	Percentages (%)
RELIGION		
Christianity	365	88.8%
Islam	46	11.2%

TABLE 2: AWARENESS OF CERVICAL CANCER AND ITS RISK FACTORS, SOURCE OF INFORMATION

VARIABLES	FREQUENCY	PERCENTAGE
Awareness of cervical cancer		
Yes	267	65%
No	144	35%
Awareness of its risk factors		
Correct response	90	21.9%
No idea	132	32.1%
Mixed response	62	15.1%
Wrong response	127	30.9%
Source of information		
Media	94	35.2%
Health worker	65	24.3%
Others	108	40.5%

From table 2 most of the respondents 267(65%) claimed to be aware of cervical cancer. However only about 90 (21.9%) respondents gave correct response to some of the risk factors they think is implicated in the etiology of cancer of the cervix. The remaining 78.1% had no idea, gave a mixed or wrong response to some of the risk factors they think could be implicated in the etiology of cervical cancer. Of the 267 (65%) respondents who claimed to be aware of cervical cancer, only 65 (24.3%) got their information from a health worker.

Table 3: AWARENESS OF SOME RISK FACTORS

VARIABLE	FREQUENCY	PERCENTAGE
Early sex		
Yes	207	50.4%
No	61	14.8%
Not sure	143	34.8%
Early marriage		
Yes	123	29.9%
No	143	34.8%
Not sure	145	35.3%
Poor social status		
Yes	73	17.8%
No	205	49.9%
Not sure	133	32.3%
Less in virgins		
yes	189	46%
No	71	17.3%
Not sure	151	36.7%
Multiple sexual partners		
Yes	230	56%
No	45	11%
Not sure	136	33%
High parity		
Yes	71	17%
No	135	33%
Not sure	205	50%
Black race		
Yes	75	18%
No	134	33%
Not sure	202	49%
Cigarette smoking		
Yes	111	27%
No	126	31%
Not sure	174	42%
Contraceptive pills		
Yes	122	29.7%
No	73	17.8%
Not sure	216	52.5%
HIV	103	25%
Yes	107	26%
No	201	49%
Not sure		
HPV		
Yes	124	30.2%
No	49	11.9%
Not sure	238	57.9%

From table 3 it can be seen that regarding the awareness of various risk factors, 134 (30.2%) respondents knew that HPV was an important predisposing factor, 207 (50.4%) early coitarche, 230 (56%) multiple sexual partners, 111 (27%) cigarette smoking, 71 (17%) high parity and 103 (25%) HIV, were other risk factors which the respondents were aware of.

Table 4: AWARENESS OF PAP SMEAR AND AWARENESS THAT CERVICAL CANCER BEGINS AS ABNORMAL CERVICAL CHANGES

VARIABLES	FREQUENCY	PERCENTAGES
Aware of pap smear		
Yes	118	28.7%
No	293	71.3%
Awareness that cervical cancer begins as abnormal cervical changes		
Yes	207	50.4%
No	204	49.6%

From table 4, of all the respondents 207 (50.4%) were aware that cervical cancer begins as abnormal cervical changes while the rest 204 (49.6%) were not aware that cervical cancer begins as abnormal cervical changes. From the study 118 (28.7%) respondents were aware of Pap smear while the rest 293 (71.3%) were not aware of Pap smear.

Table 5: DONE PAP SMEAR AND DURATION SINCE LAST SCREENING

VARIABLES	FREQUENCY	PERCENTAGES
Done pap smear		
Yes	63	15.3%
No	348	84.7%
Duration since last pap smear		
<1year	18	28.6%
1-2 years	29	46.0%
3-4 years	11	17.5%
>4years	5	7.9%

In table 5, of all the respondents only 63 (15.3%) claim to have done a pap smear while the rest 348 (84.7%) have never carried out a pap smear. Of the 63 (15.3%) respondents who have done a pap smear, 18 (28.6%) last carried out a pap smear < 1 year ago, 29 (46%) last had a pap smear 1-2 years ago, 11 (17.5%) last had a pap smear 3-4 years ago and 5 (7.9%) last carried out a pap smear over 4 years ago.

DISCUSSION

This study has shown low utilization of Pap smear (15.3%), despite significant awareness level of the disease (65%) which agrees with several studies in our environment but in different subject groups.[19, 23-36] Findings from this study where level of awareness was 65% however contrasts with high levels of awareness found among college- aged female students in the United Kingdom where a prevalence of 90% was reported.[27] It also contrasts with the low levels of awareness recorded among refugees in Ore camp (22%), market women in Ibadan (40.8%).[28]

Only about 27% of our study respondents knew about the link between smoking and cervical cancer, which is slightly higher than studies reported from Ghana 1%,[29] Sri-lanka 20.8%[30] but much lower than that reported from studies conducted in Malaysia 61%.[31]

Cervical cancer screening centres are still very few in our environment and mostly concentrated in urban areas and hospital-based.[32,33] This might account for the low level of awareness (28%) and utilization (15.3%) of Pap smear demonstrated in this study. In a study carried out in Ghana the utilization was 8.5%, while it was 5.7% and 8.7% in Nnewi and Ogun state respectively.[24,34,35] The low participation in cervical cancer screening observed in this study and similar studies in developing countries is unlike the findings in most developed countries with market economy and computerized screening programs where uptake of cervical cancer screening was generally high. In one of such studies in Germany, most women in the study group had a pap smear test at least once a year and only a few had a smear less frequently than every five years.[36] Also among Chinese American women in the USA, utilization of pap smear was as high as 84%.[37]

In this study it was observed that both the awareness and practice of cervical cancer screening (Pap smear) were low 28.7% and 15.3% respectively. This contrasts with an Enugu study (by Cyril CD et al) which recorded that increased awareness of Pap smear does not translate to its use.[38]

From the study most of the respondents got their source of information from others (friends and families) and this accounted for 108(40.5%), 94(35.2%) of the respondents got their information from the media (TV/newspaper/internet/radio) and 65(24.3%) respondents got their source of information from a health worker. Various studies have recorded different findings. In one of such studies in Kenya, healthcare providers were the principal source of information, also in Nigeria, the major source of information about cervical smear was hospital/health facility in Owerri.[39,40]

The role of professional and public education combined with availability of screening and treatment of early stage of invasive cervical cancer cannot be over emphasized as this have been shown to reduce morbidity and associated with the disease.[41]

STUDY LIMITATION:

- The study was cross sectional so causal conclusions cannot be drawn
- The investigation was carried out with students from one college and inclusion of other centers could have resulted in different results
- Students in this college are not representative of young adults in general and the cervical cancer attitude and practice may be different in other sectors of the population

CONCLUSION

The study conducted shows that the knowledge of cervical cancer, Pap smear and its utilization among the study population is still generally low. This is worrisome as these students are prospective workers in the communication and information sector. Health educations, combined with availability of the screening at affordable cost are major factors in reducing the scourge of the disease in this part of the world.

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ESTIMATION OF STATURE USING ARM-SPAN OF ADULT FEMALES IN JOS, NIGERIA

Mosugu, O.O., Mador, E.S., Nyam, J.C. and Shinku, F.
Department of Human Anatomy, Faculty of Basic Medical Sciences, University of Jos.
Corresponding author: Mosugu Ovayoza Omolara
Email: ovaza@yahoo.com
Phone number: 08035883134

Abstract

Anthropometry is a typical and basic tool of physical anthropology which forms the basis of scientific methods and techniques on which measurements and physical observations on the living as well as skeleton of man are built. In developing countries, this is an essential tool for effective health care delivery as well as in forensic medicine.This research was aimed at determining if there exists a relationship between the standing height and the arm span of adult females in Jos and to derive equations that will be used to predict these parameters, one from another. With these equations the height of a young adult female can be predicted in conditions where height cannot be measured.

This was a cross sectional study which examined the relationship between the standing height and arm span of 152 apparently healthy, randomly selected, consenting adult female students who fit the inclusion criteria. Measurements of standing height as well as arm span were taken using standardized methods and instruments and data collected was analysed using NCSS/ PASS 2006 Dawson Edition, USA.

Mean age of the subjects was 23 ± 4 years. Mean standing height was 162.4 ± 6.4cm while mean arm span was 174.0 + 8.2cm. Correlation regression analyses done showed that arm span could predict height in females by 99.7% i.e. $R^2 = 0.997$ ($P<0.05$) and height could predict arm span by 99.7% ($R^2 = 0.997$) and regression equations were derived to predict height from arm span and vice versa for male adults in Jos. The findings of this study will be beneficial to health care professionals as well as forensic scientists and other stakeholders in the judicial system and as such, it is recommended that further similar research be carried out in other parts of the country.

Key words: anthropometry, female, height, arm span, correlation

Introduction

Anthropometry is described as a typical and basic tool of physical anthropology, which provides the scientific methods and techniques for estimating the various measurements and the observations on the living as well as skeleton of man. Ogunranti [1] also describes anthropometry as the study of the variations that occur in measurable parameters to the human topography which be used to access growth and development in children, including variations in adults, especially as it relates to racial and or ethnic differences. Generally, variations measured in anthropology are those controlled by polygenic inheritance factors. Thus, the simplest of the parameters in anthropometry include height and weight which vary from community to community in mean values and from tribe to tribe. Height, like other phenotypic traits, is determined by a combination of genetic and environmental factors. Attributed as a significant reason for the trend of increasing height in parts of Europe are the egalitarian populations where proper medical care and adequate nutrition are relatively equally distributed. [2] On the other hand under-nutrition and malnutrition as well as inadequate medical care, seen in developing countries are

associated with stunted growth.

While an above average arm-span (reach) is advantageous in sports (such as basketball, boxing, swimming), any decrease in height will cause an increase in the ratio of arm-span to height. This variation may sometimes be an indicator of a health problem. Information obtained from the measurement of height is important in many settings and disciplines including the fields of science, humanities and art. Stature measurement is required the evaluation of children's growth, calculation of nutritional indices of children and adults, prediction as lung volumes, muscle strength, glomerular filtration, metabolic rate, tailoring of drug dosage in patients,[3] determination of basic energy requirements, standardization of measures of physical capacity and for adjusting drug dosage.[4] However, in some individuals with conditions that affect the limb such as in amputees and those with limb deformities, the exact height cannot be determined and so an estimate of the height calculated based on other body parameters is required. These estimations are also of prime importance in predicting age-related loss in stature, identifying individuals with disproportionate growth abnormalities and skeletal dysplasia or height loss during surgical procedures on the spine.[4] These measures are also very important in normalizing pulmonary function in scoliosis.[5]

The measurement of height is also vital in forensic medicine which is which is a branch of medicine that has a specifically legal purpose. Forensic anatomy is a new emerging field which tries to examine and identify preserved and unpreserved body parts of human remains upon which the big fours guiding forensic anthropology are established. The need to establish the identity of dismembered human remains arise from time to time in cases of mass disasters like terrorist attacks, mass murders, transport accidents, tsunamis, floods and earthquakes. Nigeria, the most populous country in Africa has its own share of mass disasters especially man made but despite the current understanding of global best practices concerning medico legal investigation of death resulting from mass disasters, it would appear that Nigeria lags behind.[6] Consequently, Nigerian forensic pathologists who have to investigate these cases have no Nigerian guidelines to go by, but have to rely on foreign data.[6] This study's objectives were to ascertain the relationship between standing height and arm span, and to derive equations that can predict height and arm span, one from the other among adult females in Jos.

Materials and methods

This was a descriptive cross-sectional study carried out on 152 randomly selected, consenting female students of the university of Jos aged between 18 and 55. Subjects with physical deformities involving the spine and the limbs were excluded from the study. Subjects that were below the age of 18 years were also excluded because they are still growing, so also were those above 55 years of age since they are likely to have degenerative disorders of the joints. The age of subjects was obtained based on the ages they indicated while obtaining consent. Every subject was measured and included only once so that a pure cross-sectional set of data was constructed. For each subject the age, sex, arm span and standing height were recorded. Age was calculated in completed years at the moment of the data collection.

The height of the subject was measured between the vertex and the floor, when the person is standing erect, in an anatomical position and the head in Frankfort plane, using a stadiometer to the nearest 0.1cm. The arm span measurement was taken with a tape rule from the tip of the middle finger of the right hand to the sternal notch (half arm span). This measurement was taken with the subject standing with the back flat against the wall and both arms abducted to 90 degrees, and with the elbows and wrists extended and the palms facing directly forward. Readings were taken twice to the nearest 0.1 cm, the average obtained and then multiplied by two (2) to obtain the total arm span. These measurements were taken according to

International Society for the Advancement of Kinanthropometry (ISAK) 2001 guidelines.

Statistical analyses were performed using Number Cruncher Statistical System (NCSS/PASS 2006 Dawson Edition, USA). Means, standard deviations and standard errors of mean were determined and regression analyses were carried out on the parameters measured.

Results

A total of 152 young adult females were studied for estimation of height from arm span measurements. The mean age of the subjects was 23 ± 4 years with

minimum age being 18 years and maximum 49 years. Table 1 shows the descriptive statistics of the measured parameters. Mean height obtained was 162.4 ± 6.4 centimeters while the mean arm-span was 174.0 ± 8.2 centimeters.

Table 1: Distribution of arm span in females showing mean, standard deviation and standard error of mean with corresponding height in centimetre.

Height (cm)	Frequency	Mean Arm Span (cm)	Standard deviation	Standard Error of mean
150 – 154	20	163.8	3.8	0.8
155 – 159	29	169.7	5.2	1.0
160 – 164	50	174.4	4.7	0.7
165 – 169	28	178.4	5.5	1.0
170 – 174	20	184.2	6.4	1.4
175 – 179	5	188.8	4.3	1.9
TOTAL	152			

Mathematical modelling of female height data plotted against mean arm span demonstrated that the best-fit regression model (figure 1) to describe the relationship between arm span and standing height was the linear equation $y = 1.012x - 14.17$ with a correlation of determination of $R^2 = 0.997$ ($P < 0.05$) where y is the height in centimeters and x is the arm span in centimeters. This means that arm span could predict the height of females in Jos by 99.7%.

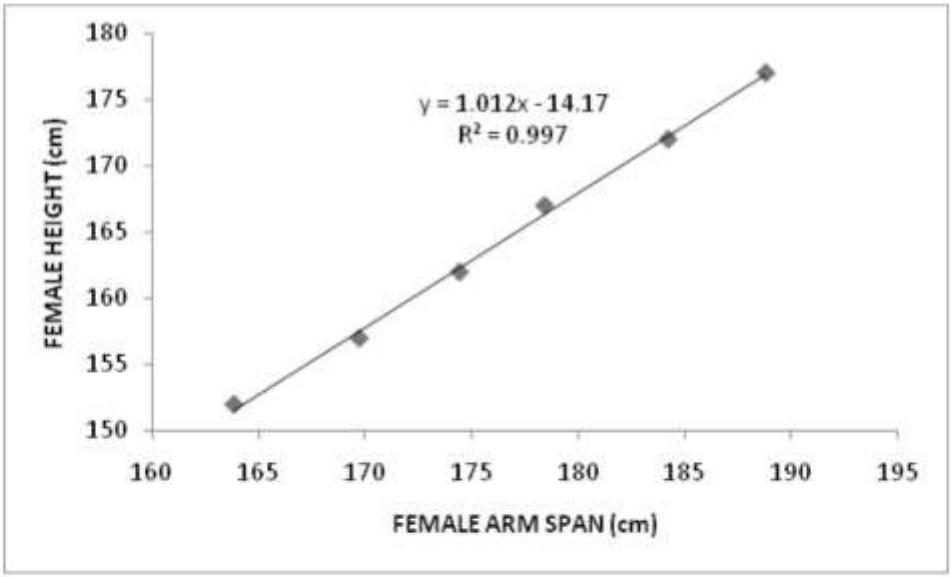

Figure1: Correlation and regression graph showing female height plotted against female arm sapn.

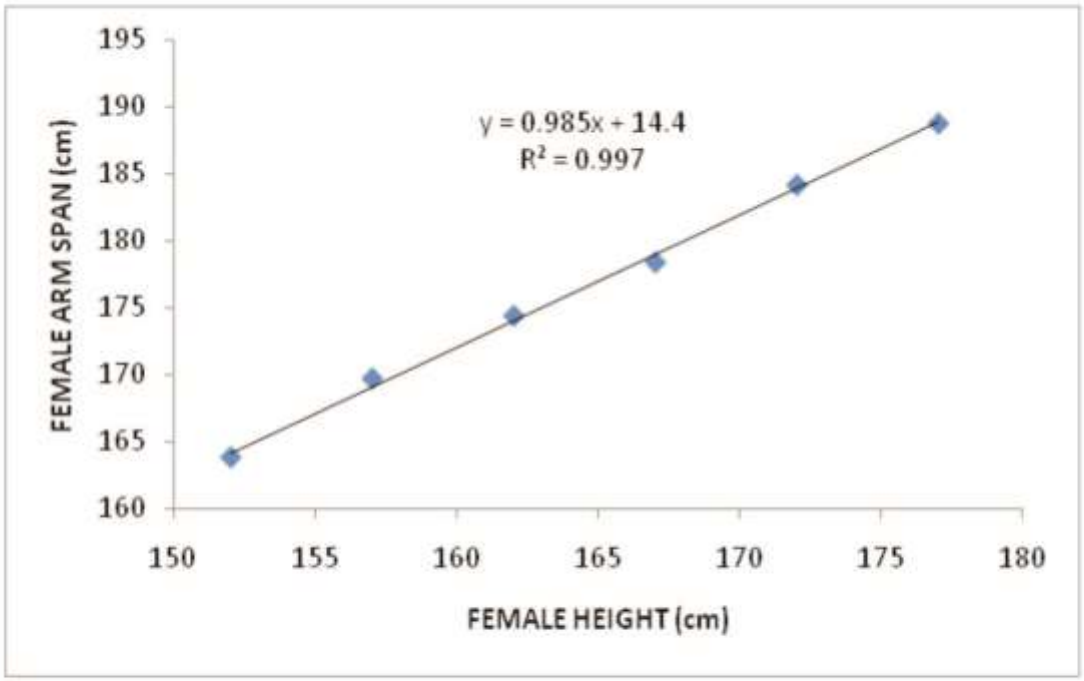

Figure 2: Correlation and regression graph showing male arm span plotted against male height.

On the other way round, when arm span is plotted against height (fig 2) the best mathematical model to describe the relationship was the linear equation $y = 0.985x + 14.4$ with a correlation of determination of $R^2 = 0.997$ ($P < 0.05$) where y is the arm span in centimeters and x is the height in centimeters. This means that height could predict the arm span of females in Jos by 99. 7% ($R^2 = 0.997$) in 152 females in this study.

Discussion

The specific aim of this study was to find out whether there exists a relationship between the arm span and the height of young, adult, female Nigerians. Documentation of research done on this subject and their findings are available from other parts of the world, but none has been documented in Jos, Nigeria. Stature and its determination are necessary and valuable tools in art, forensic medicine and more importantly in health care.

It is useful to health care givers for calculating drug dosage for treatment, as well as for monitoring growth and other health indices. To artists it is useful in determining body proportions. And to forensic anatomists and morbid anatomists, it is important to be able to determine height of victims of crime with dismembered body parts or those burnt beyond recognition, for identification when solving crimes. In Nigeria, apart from sparse, somewhat inconsistent records of finger prints (dermatoglyphics), there are no known legislative and or legal practices that optimally harnesses the wealth of knowledge and abilities of forensic experts. Nevertheless, recent happenings like increased intertribal and religious wars, political assassinations, secret cult killings, deaths due to road traffic accidents, and the like, point to the fact that time has come for Nigeria to employ forensic experts in the reconstruction of statures of affected individuals.[7]

In many of these cases where height cannot be determined, it must be estimated using another parameter / body index such as the arm span. This can only be done by use of an equation/formula that relates height and arm span. The findings of the present study have confirmed what several other investigators[3, 4, 8-10] reported, that arm span can be used to predict height confidently.

Similar studies were carried out in Benue state Nigeria[3] as well as among the Annang ethnic group of Nigeria.[8] These showed that females mean height ranged from 159.3 – 160.9 cm and mean arm span was from 163.7 – 164.7cm in Benue state, while among the Annang ethnic group, mean stature was 160.66±9.09cm and mean arm-span was 172.22±11.82cm. These values are lower than

those obtained in this study and may be due to genetic or environmental factors such as poor nutrition. Also, when compared with the average height and arm span of Montenegrins in similar study,[11] the mean standing height of females in this study is significantly lower than that of the Montenegrins. There is an assumption that Montenegrins are still the tallest population in Europe.[11] This genetic predisposition for tallness may be responsible for the higher mean values of height in both males and females when compared to those of obtained from this study. Also, European countries are more developed than African ones (such as Nigeria) and have better nutrition and thus better/healthier growth.

In this study, regression equations that can predict the height of a Nigerian female adult from her arm span and arm span from the height were derived. It is necessary to emphasize here that although similar work to this one has been done all around the world and documented, there is yet to be any documented report with regression equations that can predict height from arm span and vice versa, in Nigerian females in Jos. The regression equation obtained for female height determination from arm span was a linear regression equation where $y = 1.012x - 14.17$ with correlation coefficient (R^2) = 0.997. This implies that for every known female arm span (i.e. x), when placed in the equation, the corresponding height (i.e. y) can be determined. The correlation coefficient (R^2) = 0.997 obtained reveals a strong relationship between female standing height and arm span, because the strength of the relationship of the two parameters increase as R^2 (correlation coefficient) approaches 1.

In the analysis where the arm span can be determined from a known value of the height, the graph is positive, showing a strong relationship between the two parameters (female arm span and height) where the correlation coefficient R^2 = 0.997. The regression equation derived is a linear equation where $y = 0.985x + 14.4$. Which means that for every known value of female height (x), the corresponding arm span can be determined by substituting that value into the equation.

Conclusion

Height and arm span are basic anthropometric indices which vary with age and population and they are vital anthropometric tools that are very useful in clinical/health management. A strong, positive correlation was found to exist between the two parameters and linear regression equations were derived to predict height from arm span and vice versa. The findings of this novel study will be useful to the anatomists who will attempt to use this data to examine its relevance to the structure and associated functions of other body parts, as well as provide the necessary data for Anthropologists; the Forensic Medical Experts will find the data generated useful in certain forms of human identification in medico-legal cases; clinicians and other health care professionals will find it a handy tool for effective delivery of health care in Nigeria as well as in other parts of the world.

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KNOWLEDGE OF PAIN MANAGEMENT PROTOCOLS AMONG HEALTH WORKERS IN JOS UNIVERSITY TEACHING HOSPITAL: A COMPARATIVE ANALYSIS

AUTHORS: I.H Shambe[1],J.A Karshima[1],A Finangwai[2],J Asufi[3], Y. Tagurum[4]
Department of Obstetrics and Gynaecology University of Jos[1]
Department of Pharmacy, Jos University Teaching Hospital[2]
Cervical Screening Unit, Department of Nursing Jos University Teaching Hospital[3]
Department of Community Medicine, University of Jos [4]
Corresponding Author: I.H. Shambe iornum@yahoo.com

Abstract:
Background: Moderate and severe pain are common symptoms that accompany cancer patients in Nigeria because they often present with advanced diseases. Evidence from literature has demonstrated that health professionalsin Nigeria are ill equipped with the skills to assess or manage pain. Palliative care initiatives to address this gap include the Pain Free Hospital Initiative (PFHI). This study reports on the experience of this study in Jos University Teaching Hospital.

Methods: Scores of Pre and post-test assessments on World Health Organization protocols administered to medical doctors ,nurses and pharmacistswere analysed in the 14 calendar months that the Pain Free Hospital Initiative trainings held in Jos University Teaching Hospital.

Results: A total of 620 health professionals were trained in pain assessment and management between March 2017 and April 2018. The majority of the trainees were nurses (62.1%), 19% were medical doctors and 7.1% were physiotherapists. Other health care workers made up 10.6%.The average Pre-test scores that assessed the knowledge of participants was 46.8 (SD +/- 19.9) and the post test scores increased to 60.6(SD +/- 23.4) with a positive significance correlation value of r = 0.552.

Conclusion: The Pain Free Hospital Initiative training improved the knowledge of health care workers on pain assessment and management.

Keywords: Pain assessment, knowledge, health care workers

INTRODUCTION:

Worldwide Non Communicable Diseases (NCDs) including cancer are responsible for a majority of mortalities. It is estimated that there were 18.1 million new cancer cases across 20 world regions in 2018 and 9.6million cancer deaths. The projections are that the leading reason why life expectancy may not be achieved in every country in the 21st century will be malignancies.[1] Chronic infections such as Human papilloma virus, Hepatitis B and C, Epstein-Barr virus and Helicobacter pylorihave been implicated as causative agents in Low and Middle income countries (LMICS) and the background high prevalence rates of HIV have made it an emerging cause of malignancies.[2]

Among the challenges that confront cancer management in Nigeria areweak health systems, a shortage ofskilled health personnel and inadequate access to cancer drugs.[3] In 2012, at least 177,000 people are estimated to have died in moderate or severe pain from HIV or cancer. However, the consumption of opioid analgesics (like morphine) was enough to treat just 266 people (0.2% coverage of need).[4] Barriers to accessing pain relief in Nigeria include lack of training and awareness among health professionals and patients about pain treatment.[5]Poor health care seeking behaviour and often wrong diagnosis where patients seek care,

have made late presentation a common occurrence in tertiary health centres in Nigeria across the spectrum of all the common cancers. Over 70% of patients were found to present with already advanced stages of cervical and breast cancer, which are two of the most common cancers affecting women in Nigeria in Lagos University teaching hospital but 87.6% had visited appropriate health facilities but had wrong diagnosis that led to advanced disease and late presentation.[6] Similar studies have shown this to be true for other cancers as well.

The implication of this is that patients present with distressing symptoms with limited options for curative therapy and palliative care becomes the focus of care. One of the distressing symptoms cancer patients with advanced disease present with is pain,yet it is often under treated because barriers of related to supply chain management, lack of training of health care workers and patient's fear of addiction to analgesics.[6,8, 7] .Recognising these challenges, the Federal Ministry of Health in collaboration with the American Cancer Society piloted the Pain Free Hospital initiative in 2015.This initiative initially included Teaching hospitals in Ilorin, University of Nigeria Teaching Hospital Enugu, National Hospital Abuja and University Teaching Hospital Ibadan.

It later expanded to include Federal Medical Centre Makurdi and Jos University Teaching Hospital Jos in 2016 and 2017respectively. The aim of the initiative was to equip health care workers to assess pain and provide high quality first line treatment. The ideals of this initiative are reflected in the National Cancer Control Plan 2018-2022 that makes control of pain an essential component of cancer care.[8] We therefore sought to share the experiences of this initiative and highlight any changes in knowledge about pain management protocols among health workers practicing in JUTH following that occurred following this intervention.

METHODS

This was a 14 month retrospective study(March 2017-April 2018) that evaluated the pre and post test scores concerning knowledge of pain assessment and treatment using the World Health Organisation Pain ladder .Pre-tests were administered before validated training modules prepared by the Federal Ministry of Health and the American Cancer Society were used to train selected doctors across clinical departments where cancer patients were managed,along with nurses,pharmacists and physiotherapists in 2 day training sessions after which , Post- tests were administered to assess knowledge after the training.

Pre and post test scores were entered into Excel spread sheets and analysed. Variables such as cadre of trained health care workers and their pre and post test scores were obtained. JUTH is a tertiary health care centre in Jos, Plateau State North central Nigeria that serves a population of 3.5 million people and serves as a referral centre for 5 surrounding states as well as various private, government owned and faith based organisations within the state.

Statistical analysis

The statistical focus was to describe the pre and post score frequencies a before and after the trainings. The statistical tool used was SPSS (IBM Corporation Mac OS,Linux and Unix 2015 version 22).A p-value of less than 0.05 was used to test for statistical significance.

RESULTS

A total of 620 health care workers were trained during the period.385 were nurses (62.1%) 118 (19%) were medical doctors,44 (7.1%) were pharmacists, 7 (1.1%) were physiotherapists and other health care workers were 66 (10.6%). The average Pre-test scores that assessed the knowledge of participants was 46.8 (SD +/- 19.9) and the post test scores increased to 60.6(SD +/- 23.4) with a positive significance correlation value of r = 0.552.

AVERAGE KNOWLEDGE ASSESSMENT BEFORE AND AFTER TRAINING

Average knowledge of participants before training was 46.8±19.9 percent. However, after the training, the average knowledge of participants increases 60.6±23.4 percent, There was a significant difference in the knowledge before and after the training (t = 16.675, P = 0.000, df = 619) (table 2).

Doctors tended to have higher knowledge than other professionals followed by the physiotherapist (51.6±24.0), Pharmacist (51.2±9.8) and lastly the Nurses (49.0±10.4). The difference was statistically significant (P=0.000). Similarly, after

the training the Doctors had higher knowledge scores (67.5±20.4), Pharmacist (66.9±13.7), Nurses (65.3±13.8), Physiotherapist (62.7±13.8) and others (16.5±30.9). The difference between the knowledge scores according to cadre was statistically significant (P=0.000).

Table 1: Knowledge Score among Professionals

	Pre-test assessment		Post-test assessment	
Cadre	**Median**	**IQR (1^{st} – 3^{rd})**	**Median**	**IQR (1^{st} – 3^{rd})**
Doctor	64	55-71	73	62-80
Nurse	48	43-55	68	58-75
Pharmacist	50	43-57	68	61-75
Physiotherapist	40	35-65	63	53-70
Others	0	0	0	0

Kruskal-Wallis test=273.926, df = ***4, p*** ≤0.001***Kruskal-Wallis test***=293.998, df = ***4, p*** ≤0.001

Table 2: Pre & Post Knowledge Assessment among Professionals

Cadre	Pre-test knowledge assessment		Post-test knowledge assessment		Z*	P
	Median	IQR(1^{st} – 3^{rd})	Median	IQR(1^{st} – 3^{rd})		
Doctor	64	55-71	73	62-80	-2.924	0.003
Nurse	48	43-55	68	58-75	-13.777	≤0.001
Pharmacist	50	43-57	68	61-75	-4.823	≤0.001
Physiotherapist	40	35-65	63	53-70	-1.014	0.310
Others	0	0	0	0	-3.422	0.001
Overall	50	40-58	68	55-75	-15.049	≤0.001

Z* = Wilcoxon Rank test, IQR = Inter-Quartile Range

DISCUSSION

The total number of health care professionals trained in the Pain Free Health Initiative in the period between March 2017 and April 2018 was 620(six hundred and twenty) with nurses comprising the highest number of participants 385 (62.1%) followed by doctors 118 (19%) and physiotherapists who made up the least number of participants were 7 (1.1%) .This is explained by the fact that nurses generally are more numerous in Jos University Teaching Hospital than the other targeted health professionals .The PFHI, seeking to make pain assessment an integral part of assessment of patient's vital signs, favoured nurses to form a larger number of the trainees.

Before the training, doctors had the highest knowledge scores, with median score of 64 (IQR = 55-71) followed by the pharmacists, median score of 50 (IQR = 43-57), nurses, median score of 48 (IQR = 43-55), and lastly physiotherapists, median score of 40 (IQR = 35-65). These differences were statistically significant, Kruskal-Wallis test = 273.926, p < 0.001. Similarly, after the training, doctors had the highest knowledge scores, median score of 73 (IQR = 62-80) followed by pharmacists, median score of 68 (IQR = 61-75), nurses, median score of 68 (IQR = 58-75), and physiotherapists, median score of 63 (IQR = 53-70). These differences were also statistically significant, Kruskal-Wallis test = 293.998, p < 0.001. (Table 1)

There were statistically significant increases in the knowledge scores of doctors, nurses, and pharmacists after the training; (z = -2.924, p = 0.003), (z = -13.777, p < 0.001); and (z = -4.823, P <

DISCUSSION

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There were statistically significant increases in the knowledge scores of doctors, nurses, and pharmacists after the training; ($z = -2.924$, $p = 0.003$), ($z = -13.777$, $p < 0.001$); and ($z = -4.823$, $P < 0.001$) respectively; and the other professionals ($z = -3.422$, $p = 0.001$). However, there was no statistically significant increase in the knowledge of physiotherapists after the training ($z = -1.014$, $p = 0.310$).

Median knowledge of all participants before the training was 50 (IQR = 40-58). However, after the training, this increased to 68 (IQR = 55-75). This difference was statistically significant, Wilcoxon Rank test = -15.049, $p < 0.001$ (table 2).

While the knowledge scores were high, a study in Zaria among health workers demonstrated that the knowledge of pain assessment is not always accompanied by appropriate practice or prescription of analgesics, with only 40% of health workers routinely assessing pain while caring for cancer patients and only 51% treated symptoms of pain when patients complained. The same study showed as much 75% of respondents had no formal training on pain management. [9]This agrees with other studies that found poor knowledge of pain assessment and cancer pain management to be an impediment to the treatment of cancer pain.[10] The use of the World Health organization (WHO) analgesic ladder is an effective tool in treating over 80% of cancer pain.[11]The PFHI initiative dwelt extensively on the use of this tool in managing cancer pain.

The deficiency in knowledge of pain assessment and management in some of the health care workers before this training may be due to the fact that palliative care training is not in the curriculum of many of the health care workers in low resource settings and thus health professionals are without the skills to either assess or manage moderate and severe pain.[12]

Oral morphine solution has been compounded in Jos University Teaching hospital since 2012 at the commencement of the provision of palliative care in that facility but prescription of this drug that is considered the gold standard for the relief of moderate and severe pain in cancer patients was poor.

Results from University College Hospital Ibadan which has a longer experience with oral morphine prescription show that only 1.1% of morphine prescriptions met international guidelines and more education and advocacy targeted at prescribers (medical doctors) was needed.[13] A similar audit of prescription patterns on oral morphine highlighted this challenge in Olabisi Onabanjo University Teaching Hospital Sagamu where 17.6% were inaccurate and did not conform to international guidelines.[14]

The efficacy of educational sessions in improving knowledge of pain assessment in patients with severe cancer pain was also demonstrated by Barathi working in India.[15] and appears to be have been replicated by this intervention.

CONCLUSION:

Knowledge of pain assessment for the treatment of moderate and severe pain can be improved by educational initiatives targeted at health care workers and is necessary to improve cancer care and meet the palliative care goals of the Nigeria Cancer Control Plan.

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TRAUMATIC STRESS DISORDERS AMONG ADOLESCENT STUDENTS IN NORTH-EASTERN NIGERIA

[1]**Asmau M. Dahiru** (MBBS, M.Sc Psychol, FWACP), [2]**Victor C. Onyencho** (B.Sc, M.Sc, PhD Psychol), [2]**Baba M. Umar** (MBBS, FWACP), [3]**Kundi B. Machina** (MBBS, FWACP), [4]**Catherine Fritz** (PhD Psychol)

[1]*Department of Mental Health, Federal Neuropsychiatric Hospital, Maiduguri, Borno State, Nigeria*
[2]*Mental Health Department, Faculty of Clinical Sciences, College of Medical Sciences, University of Maiduguri, Maiduguri, Borno State, Nigeria*
[3]Specialist Hospital, Gujiba Road, Damaturu, Yobe State, Nigeria
[4]Department of Psychology, University of Northampton, United Kingdom

Corresponding Author
Victor C. Onyencho (PhD)
Mental Health Department, College of Medical Sciences,
University of Maiduguri,
Maiduguri, Borno State, Nigeria
victorchid01@yahoo.com, +231 7033226293

Abstract

Background: Post-traumatic stress disorder (PTSD) is often seen following exposure to traumatic events in children and adolescents. The dearth of studies on the correlates of PTSD among adolescents in North-Eastern Nigeria calls for concerns.

Objectives: Hence, this study examined the presence of PTSD among adolescents in North-Eastern Nigeria.

Methods: The study adopts a cross-sectional survey design and multistage sampling techniques were used. Stratified sampling technique was used to select the schools into public and private schools, and finally, simple random sampling was employed to select 480 adolescent students, males 45% and females 55%.

Results: It was found that the prevalence of PTSD among adolescents in Maiduguri was 19%. Nature of the traumatic events differs, ranging from bomb blast 41.7%, gunshots 31.3%, witness a killing/seeing a dead body 7.7%, serious road traffic accidents 10.2%, sudden death of someone 3.5% to others 5%. The trauma has affected 47.3% of the adolescent's academic performance.

Conclusions: PTSD is a reoccurring phenomenon in crisis-prone environments; it is therefore recommended that mental health programs in the form of psycho-education should be incorporated for adolescent students in crisis-ravaging environments.

Keywords: Adolescents, Correlates, PTSD, Maiduguri, Students.

INTRODUCTION

World Health Organization (WHO) defines an adolescent to be between the ages of 10-19 years while young persons are those aged up to 24 years.[1] Adolescence is a period of major developmental processes that span across all aspects of functioning as it corresponds with the main structural changes occurring in the brain.[2] Despite the critical developmental stage of these adolescent students in Maiduguri, they have witnessed one form of trauma or the others such as bomb blasts, gun shooting, kidnapping, killing, and see the dead bodies, and so

on. However, exposing adolescents to traumatic events may lead to reactions that interfere substantially with day-to-day functioning and cause significant distress in the long run.[3]

Residents in North-Eastern Nigeria have been living in peace and harmony until 2009 when the Boko Haram insurgency began. The crisis has forced 1.5 million people to flee to other parts of the country and neighbouring countries, about 13, 000 - 17, 500 death was recorded,[4] and the crisis are still ongoing. In a crisis, psychological disturbances such as post-traumatic stress disorder (PTSD) often follow a range of traumatic life events.

People diagnosed with PTSD in most cases have directly or indirectly experienced, heard, or witnessed life-threatening events. Diagnosis is associated with how an individual reacts with intense fear, horror, or helplessness in relation to an actual occurrence of the threat of an event to self or others.[2] PTSD can occur as a result of exposure to a momentary experience or a continuous/chronic traumatic event. Furthermore, PTSD was classified into event trauma (if it is sudden, unexpected, and limited), and process trauma (when it is a long-lasting, continued exposure).[5] PTSD is considered acute when the duration of symptoms is less than three months, chronic when symptoms last three or more months, and as having a delayed onset when symptoms develop six months after traumatic events.[2] PTSD is common across diverse ethnic and cultural groups,[2] and seen in all ages.[6]

In Nigeria, the prevalence of PTSD following road traffic accidents in Enugu was documented as 26.7% compared to 8.0% and 8.7% of the two control groups.[7] Also, in a longitudinal study, it was found that 22% of 68 Nigerian Army veterans had PTSD in Lagos following immigration from Liberia and Sierra-Leone.[8] Similarly, in a study conducted between two groups of residents in the Niger Delta over six months following human-initiated disasters, those in highly violent inflicted areas had a prevalence of PTSD as 60% compared to 14.5% of the relatively spared area.[9] In North Central Nigeria, a prevalence of 36%-47% following an ethnoreligious conflict in Jos was reported.[10] In a study conducted among University undergraduate students in Maiduguri, a prevalence of 17.8% for PTSD was reported,[11] this finding validates the silent suffering of individuals exposed to a traumatic experience such as rape, torture, assaults, displacement, and so on in North-Eastern Nigeria.

Various factors predispose and precipitate one to develop PTSD after witnessing traumatic events such as exposed stressors; previous coping strategies; and understanding of the trauma and how the individual perceives it.[12] Displacements, stigma, family characteristics, and psychiatric history are also associated with an increased risk of PTSD.[13] The traumatic event itself, its severity, type, and duration of trauma influence PTSD, this is also related to the person's social surroundings, experience, and culture,[2] are all implicated.

Most studies found PTSD to be common among females, and this is associated with various reasons and these include: the greater likelihood of females to experience stressful events are socio-cultural factors and biological changes associated with puberty, females internalise issues compares to males,[14, 15] females are more likely to ruminate leading to increase risk of PTSD.[16] PTSD is also common among lower social class families and those that live in urban areas.[14] Furthermore, the younger age groups were also more likely to present with PTSD than older ones.[2, 16] This was associated with a lack of prior knowledge and understanding of trauma, also the way young adolescents process the events is closely related to their ability to regulate emotions which varies depending on development.[16]

Exposure to traumatic events should be addressed as a public health issue with an emergency, response to terror and violence rather than diagnosing mental illnesses especially PTSD, since symptoms might not have occurred in the absence of the conflict.[17] Furthermore, not all those that are exposed to traumatic events develop PTSD as a method of adaption and individual characteristics vary.[18] Therefore, correlates and associated factors in PTSD should be explored in other to fully understand the psychopathology.

Statement of the Problem

The dearth of information on PTSD among adolescents in developing countries is of concern. In Nigeria, so far, only a few studies documented the prevalence of post-traumatic stress disorder among adolescents in Nigeria,[14] and it was conducted three years ago in South-Western Nigeria. None has been done among adolescent students in North-Eastern Nigeria, where there has

been repeated exposure to traumatic/life events like bombings, killings, shootings, seeing dead bodies on the streets, kidnapping, burnt houses, and schools, forced migration, child soldiers, etc. Although, Onyencho et al. examined PTSD and psychological well-being, however, it was done among the University of Maiduguri students.[11] Therefore, this study intends to fill this gap by providing more information on PTSD among adolescent students in Maiduguri.

PTSD has a high co-morbidity with other mental disorders especially in children and adolescents with severe trauma, making it more difficult to treat when it occurs.[19] High suicidal rate seen in PTSD was associated with its comorbidity with major depression and anxiety disorder.[20] Despite these effects, the impact of PTSD on health and wellbeing has been neglected especially among adolescents in developing countries.[21] In view of this, this study finds it worthy to investigate how PTSD affects adolescent students.

In April 2014 over 300 girls between ages, 16-18 were kidnapped from school while writing their final exams in Chibok a local government of Borno State about 125 kilometers from Maiduguri, and the school burned, most of these girls are yet to be found, further kidnapping and killings of more women and children are still on.[22] The psychological impact of these traumatic events on the students might precipitate vicarious trauma that requires medical attention since most of these students still reside in high-risk zones such as Maiduguri and its environment as internally displaced persons (IDPs).

Objectives of the Study

The general objective of the study is to explore the correlates of PTSD among adolescent students in North-Eastern Nigeria. The specific objectives of this study would include:

1. To determine the prevalence of PTSD among adolescent students in North-Eastern Nigeria.
2. To determine the correlates of PTSD among adolescent students in North-Eastern Nigeria.
3. To investigate the impact of PTSD on adolescent student's academic performance.

METHODS

Design

A cross-sectional survey design was adopted.

Sampling Techniques and Procedure

Sixty secondary schools were listed by the Ministry of Education Maiduguri covering two local governments, Maiduguri Metropolitan Council (MMC) and Jere Local Government Area. There are twenty public and forty private schools. The schools were stratified into public and private schools, then using simple random sampling, four schools were randomly selected from each group making a total of eight schools. Following the available list at the ministry of education, each second-year senior school has a range of one hundred and forty to one hundred and sixty students, classes A-D (some places more) and their names are arranged alphabetically in a school register. Using simple random sampling techniques 480 second senior year students were selected; 216 (45%) males and 264 (55%) females. The youngest was 14 years old while the oldest was 22 years. The median age was 17 years. The main ethnic group was Kanuri (53.8%), Hausa (11.9%), Fulani (9%), and other tribes (25.3%) after explaining the contents of the consent and assent forms to the students.

Inclusion-Exclusion Criteria

The following eligibility criteria were applied to identify the participants for the research study: (i) the participants' age ranged from 14 to 18 years, (ii) the participants must be confirmed to be free from psychiatric and medical disorders, (iii) the participants must have a good command of English or Hausa language. And the exclusion criteria were as follows: (i) the participants who are below age 14 and above age 18 years, (ii) the participants who are suffering from psychiatric and medical disorders were excluded, (iii) the participants that did not have a good command of English or Hausa language.

Ethical Consideration

The ethical committee panel from the University of Northampton, United Kingdom, and the Ministry of Education, Maiduguri, Nigeria approved this study. Furthermore, the principals of all the schools involved were carried along before the commencement of data collection. Also, informed consent and assent forms were distributed,

explained, and signed by the participants and their parents through the principals. Since informed consent and assent is a vital element in ethically executing research; it included the introductory letter for the study, the purpose of the research, the basic knowledge before the completion of the questionnaire so that every participant understands the significance of the questions asked. The informed letter was kept confidential to protect the identity of the participants and was reassured that under no circumstances their identification would be exposed or disclosed. The participants were also assured that the study is voluntary and at any point, they can leave the study, and the risks and benefits of the research were explained to the participants, parents, and teachers.

Measures

A *socio-demographic questionnaire* was designed to collect relevant information about risk factors for PTSD in children and adolescents. Information about age, gender, type of student (boarding or day), address, family, religion, and tribe were obtained. Others are the family background of the students, including family type (monogamous/polygamous), parents' marital status (living together, separated/divorced, or widowed), family size, and relationship with family members (if perceived to be cordial and supportive). Information about caregivers (who may or may not be the parents) and parent's educational level and occupation were obtained. Also, information about traumatic events in the past, their nature, duration, whether momentary or continuous, how it affected the participant, previous coping styles, and family history of mental illness was obtained.

Also, the *post-traumatic stress disorder checklist PTSD-PCL*, the civilian version was used to collect data.[23] The instruments have three versions, the civilian version (PCL-C) is used with any population. Respondents rate each item from 1 "*not at all*" to 5 "*extremely*" to indicate the degree to which they have been bothered by that particular symptom over the past month, with scores ranging from 17 to 85. Examples of questions include "*Repeated, disturbing dreams of a stressful experience from the past?*" "*Feeling distant or cut off from other people*?" etc. It has a sensitivity (0.78- 0.94), specificity (0.71- 0.99), internal consistency (0.97) and test-retest reliability (0.87).[24,25] This present study used a cut off of 50 to make a PTSD diagnosis.

Statistical Analysis

The data collected was analysed using SPSS 20.0, a descriptive statistic was employed.

RESULTS

The prevalence of PTSD was high among adolescents students in Maiduguri, 19% prevalence rate were reported among the participants. Common symptoms associated with PTSD were reported, 82.3% had symptoms in keeping with hypervigilance, exaggerated startle response, and poor concentration, and 60.3% had avoidance symptoms. In terms of sex, more females had PTSD than males, females (24.6%), and males (12.0%).

Table 1: Showing the Participants socio-demographic characteristics

Socio-demographic variables		N	%
Gender:	Male	216	45
	Female	264	55
Age:	18	423	88.3
	> 18	57	11.6
Ethnicity:	Kanuri	258	53.8
	Hausa	57	11.9
	Fulani	43	9
	Others	116	25.3
Religion:	Islam	432	89.9
	Christianity	47	9.8
Area of Residence:	Safe	185	38.5
	Unrest	107	22.3
	Others	188	39.2
Type of Student:	Day Schools	480	100
Family Type:	Monogamous	294	61.3
	Polygamous	181	37.7
	Others	5	1
Family Size:	6 MEMBERS	45	9.4
	>6 members	435	90.6
Family Support:	Supportive	458	97.5
	Non-supportive	1	0.2
	Others	11	2.3
Relationship with Parents:	Cordial	455	94.8
	Non-Cordial	19	4.0
	Others	6	1.2
Occupation of Parents:	Professional	156	32.5
	Standard	141	29.5
	Menial	141	29.5
	Others	42	8.7

The result in table one shows that a total of 216 (45%) were males and 264 (55%) were females participated in the study, this implies most of the participants were females. Age 18 years and below were 423 (88.3%), and age 18 years and above were 57 (11.6), this is an indication that the majority of the participants were under eighteen years old. The main ethnic group was Kanuri (53.8%), Hausa (11.9%), Fulani (9%), and other tribes (25.3%), finally, the majority of the participants were Kanuri by tribe, and this ethnic group most affected by the insurgency.

A total of 431 (89.9%) of the participants practice Islam, while 47 (9.8%) are Christians, this indicates that a high number of the participants were Muslims. In terms of residential locations, 185 (38.5%) of the participants live in relatively safe areas, 107 (22.3%) in areas where traumatic events are more prevalent and 188 (39.2%) in other areas, this implies that a high number of the participants resides in a highly volatile area. All the students presently are day students as the government could not provide security for boarding schools.

Two-thirds (61.3%) of the students were from monogamous families, of which about 90.6% of them are from six or more family members, 94.8% have cordial relationships with parents and 97.5% claimed to have family support in dealing with

stress and helping them to cope. Parents of 156(32.5%) of the students are professionals, 141 (29.4%) standard jobs, 42 (8.7%) unemployed/retired, and 141 (29.4%) other menial jobs.

Exposure to traumatic experiences, nature and how it affects the participants, history or family history of mental illness

Three hundred and ninety-one students (81.5%) were exposed to various traumatic events, out of which 335 (69.8%) had continuous exposure, while 142 (29.6%) exposure was once. Nature of the traumatic events varied from bomb blast 200 (41.7%), gunshots 150 (31.3%), witness a killing/seeing a dead body 37 (7.7%), serious road traffic accidents 49(10.2%), the sudden death of someone 17(3.5%) and others 24 (5%). Although half of the participants (52.5%) disclosed that the events have not affected their school while 227 (47.3%) acknowledged that events have affected their school that was noticed by poor attention and concentration and a decrease in their grades. Almost two-thirds of the respondents (56.7%) have not had exposure to serious traumatic events in the past, with (43.1%) being exposed to trauma in childhood. Four hundred and twenty-five (88.5%) had no family history of mental illness, 55 (11.5%) had a history of mental illness.

DISCUSSION

The majority of the students assessed were in day schools for security reasons; this is because children tend to attend school close to parents, coupled with the current situation where boarding schools are attacked at night. More than three-fourths of the students were Muslims, again reflecting the strong Islamic composition of the larger population of the study location. There were fewer males than females in the study population with 45% and 55% respectively. This reflects the gender ratio of the class registers; it is, therefore, an indicator that there are more females than males enrolled in secondary schools in North-Eastern Nigeria.

The prevalence of PTSD found in this study was 19%, a similar finding was reported by Onyencho et al[11] where a prevalence of 17.8% for PTSD was found among the University of Maiduguri students. This finding confirms the silent suffering of residents of Maiduguri either as a student, professionals, labourers, traders, commuters, etc. The agreement found in these studies was as a result of the similarity of the participants and the same instruments were used to assess PTSD among the study population. Contrarily, Oladeji et al[14] reported a prevalence of 2.4% among adolescents in Ibadan, Nigeria, the low rate reported might be as a result of the instrument utilized to assess PTSD, a clinical interview was used and there is also variation in the study settings as Ibadan is one of the largest and most peaceful cities in Nigeria compared to Maiduguri.

Female gender was one of the socio-demographic variables that showed a significant association with PTSD in this study. Female students had significantly higher rates of PTSD than males. This finding is supported by most of the studies both in developed and developing countries.[14]

A larger proportion of the participants had experienced traumatic events. More than half still experiencing trauma because of the unending crisis in this part of the country. This finding was in agreement with Ruggiero et al[5] study that classified trauma as an event or process trauma.

The nature of the traumatic events experienced by adolescent students in Maiduguri varies from a bomb blast, gunshots, witness a killing/seeing a dead body, serious road traffic accidents, the sudden death of someone and others. Less than half of the participants disclosed that the events affected their school evidenced by poor attention and concentration and a decrease in their grades. Also, less than half were exposed to trauma in childhood. A high percentage of the participants had a family history of mental illness; this finding was of the same view with a previous study by Adewuya et al[13] that displacements, stigma, family characteristics, and psychiatric history are associated with increased risk of PTSD.

CONCLUSION

This study revealed that the prevalence of post-traumatic stress disorder among adolescent students in this environment is relatively high. It is high among secondary school students in Maiduguri and is associated with the presence of ongoing traumatic events. It has also shown that PTSD is more common among female and younger adolescents. The nature of the traumatic events experienced by adolescent students in Maiduguri

are bomb blasts, gunshots, witness a killing/seeing a dead body, serious road traffic accidents, the sudden death of someone and others. And some of the participants reported that the events affected their school evidenced by poor attention and concentration and these have led to a decrease in their grades. And family history of mental illness was a significant correlate.

It is therefore recommended that students, parents, school authorities, mental health professionals, and the relevant Ministries of Health and Education be aware of this condition and its correlates and to take measures to detect it early and ensure preventive measures are instituted to reduce the sequelae of the disorder by introducing mental health programs in form of psycho-education in schools, especially in crisis infected environments.

Like most studies, this present study also had some weaknesses and limitations. Of significance is the inability to compare the self-administered instrument with a clinical interview. Besides, studies have documented the unreliability of self-assessment measures as participants can over or under-report, which cannot be overlooked in this study as some may feel the need to or not to disclose.

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