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Nigeria Medical Association, Borno State Branch, Nigeria

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PREDICTORS OF DEPRESSION AND PSYCHOMETRIC EVALUATION OF THE BECK DEPRESSION INVENTORY-II (BDI-II) AMONG ADULTS ON HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN MAIDUGURI, NORTH-EASTERN NIGERIA

IBRAHIM AW[1], WAKIL MA[1], JIDDA MS[1], OMEIZA BA[1], PINDAR SK[1], RABBEBE IB[1], YUSUPH H[2]

ABSTRACT

Background: Depression is the commonest neuropsychiatric disorder among people living with HIV (PLHIV) but it remains highly underdiagnosed among this vulnerable group due mainly to low index of suspicion on the part of clinicians and the lack of brief, reliable and valid screening instruments in the very busy clinics of sub-Saharan Africa. **Objective:** This study assessed the predictors of depression among adults on highly active antiretroviral therapy (HAART) at the University of Maiduguri Teaching Hospital (UMTH) as well as evaluated the psychometric properties of the shorter version Beck Depression Inventory (BDI-II) among the subjects. **Methods:** This was a two-staged cross sectional survey conducted on 303 adults on HAART who were selected through the systematic random sampling technique at the ART clinic of the UMTH. In the first stage, anonymous sociodemographic questionnaire and the BDI – II were administered, while in the second stage, subjects who met the cut off score of 18 together with 30% of those with lower scores were administered the depressive disorder module of the composite international diagnostic interview (CIDI) as the gold standard. Bivariate and logistic regression analyses were used to determine the predictors of depression while Cohen's Kappa, Cronbach's alpha and the validity coefficients were computed to determine the psychometric properties. **Results:** Over 20% of the subjects were depressed. Female gender, past history of psychiatric illness, family history of psychiatric ailment and short duration of HIV seropositivity were significant predictors of depression with the following odds ratios; O.R. = 2.820, p = 0.006, O.R. = 23.420, p = <0.001, O.R. = 7.872, p = 0.002 and O.R. = 0.332, p = <0.001 respectively. The psychometric properties were excellent with Kappa and Alpha values of > 0.9 each, sensitivity and specificity of > 90% each, with positive and negative predictive values of > 91% each. **Conclusions:** Depression affects one out of every five HIV+ subjects and the BDI – II is a valid instrument for the detection of depression in this group. We therefore recommend the routine screening of depression among adults on HAART with vulnerability factors using this instrument.

KEYWORDS: Depression, Psychometric properties, Beck Depression Inventory, Highly Active Antiretroviral Therapy (HAART).

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INTRODUCTION

Clinical depression is one of the leading causes of disabilities in individuals afflicted by it because of its association with a spectrum of complications ranging from physical, cognitive, social and/or role functioning impairment.[1] The World Health Organization (WHO) estimated in the year 2000 that depression accounted for 4.5% of Disability Adjusted Life Years (DALY), thus making it the fourth highest

determinant of the global burden of diseases. Major Depression is also the second leading cause of disability, as it accounted for 12.1% of Years Lived with Disability (YLD) in Europe and North America and it was projected that depression will be the leading cause of disabilities in the low income regions of the globe, predominantly sub-Saharan Africa, by the year 2020. [2] The figures highlighted above were for depression as a single clinical entity, however, this condition commonly co-exists with many chronic disorders including Human Immunodeficiency Virus (HIV) infection whose status has changed from a rapidly fatal disease to a chronic one due to the introduction of the antiretroviral medications. [3 - 9] The prevalence of depression in HIV infected clinic populations varies widely from 22% in the United States, 28.7% in Nigeria, 38.7% in South Africa, and up to 54.3% in Kampala, Uganda.[10 - 13] Ciesla and Roberts in 2001 conducted a meta-analysis of data from 10 studies that examined the prevalence of depression among HIV infected individuals and it revealed a two-fold increase in the prevalence of depression when compared with the HIV-negative individuals. [14] Research evidences have also shown that depression in the context of HIV infection may be responsible for additional illness burden, reduction of adherence to the antiretroviral medications (ARVs) and thus acceleration of progression to AIDS as well as reduction in the quality of life of the patients. [15 - 19] Poor adherence is directly associated with poor medical outcomes and can also result in the development of viral mutations, which can lead to drug resistance. [20, 21]

Despite the negative impacts of comorbid depression on the clinical parameters of patients with chronic medical conditions, depressive disorders remain largely underdiagnosed particularly in persons living with HIV (PLHIV) in the African sub-continent. The lack of a valid, easy-to-administer and brief screening tool for the detection of this clinical condition might be responsible for the underdiagnosis. Though, the Beck Depression Inventory (BDI) has been used widely in both clinical and non-clinical samples, its suitability and utility among HIV-infected adults in sub-Saharan Africa have not been well documented. The determination of the degree of concordance and the validity coefficients of an instrument as propounded by Stewarts are mostly adapted for such purposes. [22]

This study determined the predictors of depression and evaluated the psychometric properties of the shorter version of the Beck Depression Inventory (BDI-II) as a screening tool against the depressive disorder module of the Composite International Diagnostic Interview (CIDI) as the 'gold standard' in the diagnosis of clinical depression.

MATERIALS AND METHODS

This study was conducted at the outpatient antiretroviral (ART) clinic of the University of Maiduguri Teaching Hospital (UMTH) in Northeastern Nigeria. At the time of data collection, the ART clinic had 5, 574 registered subjects with 3, 594 of them already placed on treatment with the HAART regime. [23] The sample size was calculated using a prevalence of depression of 35% among HIV+ subjects in Northern Nigeria obtained by Shehu et al [24] and was set at 95% confidence interval and 0.05 degree of freedom. The computation yielded a representative sample of 350 subjects. The 350 subjects enrolled into the

study were selected using the systematic random sampling technique (n^{th} sampling) and a sampling ratio of 1:10 was adopted. Hence, the sampling interval was every other tenth patient until the total number of 350 patients was reached. The list of all patients in the clinic constituted the sampling frame and the starting point on the list was chosen at random using the random number tables.

The inclusion criteria were: (a) all consenting adults on HAART and (b) those on HAART between the ages of 18 and 65 years. The exclusion criteria were: (a) those with marked cognitive impairment, (b) those with comorbid chronic or severe physical illnesses capable of impairing their response, and (c) non-consenting adults.

For the purpose of detecting subjects with cognitive impairments, all of them were screened by a single investigator by carrying out a simple cognitive functioning assessment. Thus, the patients were assessed for orientation in time, place and person, attention and concentration, as well as the immediate, recent and remote memories. Based on the outcome of this clinical test alone, those respondents found to have impairments on any of these cognitive domains were excluded.

Ethical Consideration

The study was approved by the hospital's institutional review board. In order to ensure confidentiality, codes were used for data entry and analysis.

Study instruments

The following instruments were used in the study: An anonymous socio-demographic questionnaire: This was designed by the authors soliciting for the age, sex, occupational status of the respondents using the social class stratification by Borofka and Olatawura. [25] This system classified individuals based on their occupations into: social class I, (consisting of highly skilled professionals like Doctors, Lawyers, etc.), social class II (consisting of intermediate skilled professionals like, Technicians, nurses, etc.), social class III (consisting of low skilled respondents like junior clerks, drivers, junior military and paramilitary officers, etc.), social class IV (consisting of unskilled respondents like petty traders, messengers, etc.) and social class V (consisting of unemployed respondents). Other critical information such as marital status, years of education, family history and past history of psychiatric illness were also incorporated into the questionnaire.

Basic clinical information such as the duration of the ailment since diagnosis, CD4 counts and the CDC staging of the disease were obtained from the respondents' medical records.

Beck Depression Inventory, 2nd edition (BDI-II): It is a 21 – item instrument and one of the most widely used for screening and analysing the intensity of Depression. It assesses 4 components of Depression, viz.; cognitive, behavioural, affective and somatic. [26,27] Each item is scored on a scale of 0 to 3 and the ratings are summed up to yield a total score that can range from 0 to 63. The higher the total score, the severer, the depressive symptoms. It is widely used and has been validated for use in Nigeria and a score of 18 and above indicates a depressive disorder. [28, 29, 30] The BDI-II has been positively correlated with the Hamilton Depression Rating Scale (HDRS) with a Pearson r of 0.71, showing good agreement. It also has high test-retest

reliability (Pearson r = 0.93) and high internal consistency (r = 0.91). [31,32]

The depressive disorder module of the Composite International Diagnostic Interview – World Mental Health Version 3.0 (CIDI – WMH 3.0): It is a highly structured clinical interview designed with the property of generating diagnosis according to both the International Classification of Diseases 10th Revision (ICD 10) and the Diagnostic and Statistical Manual 4th Edition (DSM IV) criteria. The interviews of CIDI are presented in a modular form thus permitting the selective investigation of a diagnosis of interest to the exclusion of other diagnostic groups. Independent studies that compared the degree of concordance between the depressive module of the CIDI and clinician's diagnosis of depression using either the DSM-IV or the ICD-10 criteria have consistently shown acceptable degrees of concordance with Kappa values (K) in the range of 0.71 to 0.93 across different samples thus making it a valid module for the detection of depression in both clinical and non-clinical samples. [33, 34] The world mental health survey conducted in Nigeria in 2004 used this instrument. The Ibadan center of the African regional office (AFRO) of the World Health Organization (WHO) trained three of the investigators and granted permission for its use.

Data Collection Procedure

This was a two-staged cross-sectional study. In the first stage, the sociodemographic questionnaire and the BDI – II were administered to all the subjects. The BDI II was used a screening instrument in this study. The subjects were interviewed separately in different rooms in order to ensure confidentiality. In the second stage, all subjects with BDI – II scores of equal to or greater than 18, which is the recommended cut-off value for this environment were selected. Seventy two respondents (representing 30%) of those with BDI - II scores below 18 were also randomly selected for this stage of the study. The choice of 30% of those with scores below the recommended cut-off was to correct for the misclassification rate. In this stage, the depressive disorder module of the CIDI which was used as the 'gold standard' was administered to all the subjects by different interviewers who were blinded to the outcome of the initial assessment. All interviews were conducted at one sitting in order to reduce the rate of attrition. Diagnosis of Depression was made using the ICD-10 criteria by matching the symptoms generated by CIDI with the ICD-10 diagnostic criteria. All interviews were conducted in English; however the interviewers used the Hausa version that was translated using the iterative back translation method for those respondents who do not understand English. Precise semantic and idiomatic equivalents were maintained as much as possible in the translation process.

Statistical Analyses

The data generated were analysed with the SPSS version 16. Descriptive statistics were used to assess the BDI-II – diagnosis of depression as well as the sociodemographic and clinical correlates of depression among the subjects. Bivariate analyses were used to examine the correlates of depression. Factors found to be statistically significant were subjected to logistic regression with the BDI diagnosis as the dependent variable and the factors

as the covariates to determine their combined effects on depression among the subjects. Diagnostic concordance between the BDI-II and CIDI was calculated using the Kappa statistics which controls for chance agreement. [35, 36] In interpreting the Kappa, value greater than 0.75 is interpreted as excellent agreement beyond chance, significant value of 0.40 and below indicates poor agreement, and values in between represent fair to good agreement. [37] Item analysis was performed to determine the internal consistency of the overall BDI-II scale. Cronbach's α values of $\geq$ 0.7 are considered good to excellent, values of $0.6 \leq \alpha < 0.7$ are considered acceptable, while values < 0.6 are considered poor. [38]

The validity co-efficients of the BDI –II among the adults on HAART were then determined by categorizing each respondent as either a case or non-case following the CIDI criterion interview across a range of threshold values from 15 to 21 in order to give a range of +3 and -3 around 18 which was earlier reported to be the best cut-off for this environment by Awaritefe. [30] The definition of the Stewart's components [22] of the validity co-efficients of the BDI-II were based on the following assumptions:

1. Sensitivity: The proportion of positive (correct) BDI-II diagnosis of depression among those with CIDI diagnosis based on ICD-10 criteria among the subjects.
2. Specificity: The proportion of negative (no) BDI-II diagnosis of depression among those without CIDI diagnosis.
3. Positive predictive value: The proportion of positive CIDI diagnosis of depression among those with a BDI-II diagnosis.
4. Negative predictive value: The proportion of negative (non-CIDI) diagnosis of depression among those without a BDI-II diagnosis.
5. False positive rate: 1 – Specificity
6. Misclassification rate: The proportion of total subjects that were wrongly classified.

Finally, a Receiver Operating Characteristic (ROC) analysis was done and the curve plotted with the sensitivity on the vertical axis and 1 – specificity (False positive rate) on the horizontal axis across the range of thresholds from 15 to 21 in order to determine the value with the best discriminant ability which corresponds to that with the largest Area Under the Curve (AUC).

RESULTS

Of the 350 subjects who were recruited for the study, the data of only 303 respondents (86.6%) were finally analyzed. The data of the 47 patients that were not analyzed included those who declined to give informed consent (n=17), those with comorbid debilitating physical illnesses and severe cognitive impairment that affected their response (n=11) and those whose questionnaires could not be analyzed due to missing data (n=19).

Prevalence of Depression and the sociodemographic profile of the subjects

Of the 303 subjects on HAART, Sixty two (62) representing 20.2% of the respondents had the BDI – II diagnosis of depression and 60(19.8%) met the ICD-10 diagnostic criteria based on CIDI – generated data. Out of the 303 patients on antiretroviral therapy, 164 (54.1%) were males and 139 (45.9%) were females. The ages of the respondents ranged from 18 to 54 years with a mean age of 35years $\pm$ 8.20 and 70%

of the respondents were less than 40 years of age. One hundred and ninety seven (65%) of the subjects had less than 12 years of education with a range of 0 to 18 years and a mean ± SD of 8.45 ± 6.149. Over 64% of the subjects belonged to the lower social classes (classes IV and V) and about 41% of the total subjects were married. Bivariate analysis revealed that of all the sociodemographic variables, only female gender was found to have a statistically significant relationship with the diagnosis of depression as over 72% of the depressed respondents were females (χ^2 = 22.39, df = 1, p = < 0.001). The findings are illustrated in table 1.

The clinical variables of the subjects as predictors of depression

The Clinical profiles of the subjects revealed that the mean ± SD of the duration of the disease since diagnosis was 2.8 ± 1.792 years, with a range of 1 – 8 years and 70% had lived with it for ≤ 3 years. The mean ± SD of the CD4 count of the subjects was 278.78 ± 142.76/μL with a range of 45 to 912/μL and over 80% had CD4 count ≤ 399/μL. Over 90% of the subjects belonged to CDC stages III and IV disease. Sixteen of the 18 subjects with past history of psychiatric ailment also had depression while 17 of the 22 subjects with family history of psychiatric ailment also met the criteria for the current diagnosis of depression in the context of the HIV infection. The following clinical variables, namely; the duration of the disease since diagnosis, the CD4 count at the time of the study, past history of psychiatric ailment and the family history of psychiatric disorder were found to have statistically significant relationships with the diagnosis of depression with the following findings: $\chi2$ = 48.333, df = 2, p = < 0.001, $\chi2$ = 16.568, df = 1, p = < 0.001, $\chi2$ = 55.055, df = 1, p = <0.001, and $\chi2$ = 47.43, df = 1, p = <0.001 respectively. These findings are presented in table 2.

Outcome of logistic regression analysis of variables

Logistic regression analyses of the variables found to have statistically significant relationship with the diagnosis of depression on bivariate analyses, namely; female gender, shorter duration of disease, lower CD4 count, past history of psychiatric ailment, and family history of psychiatric illness showed that only the CD4 count did not have significant relationship with depression on further analysis. The odds ratios as expressed by the Exp (B) and the p values for the variables were: O.R. = 2.82, p = 0.006; O.R. = 23.420, p = <0.001; O.R. = 7.872, p = 0.002; and O.R. = 0.332, p = < 0.001 for sex (female gender), past history of psychiatric ailment, family history of psychiatric illness and the duration of seropositivity respectively. The findings are depicted in table 3.

Psychometric properties of the BDI-II among the HIV+ respondents

The diagnostic concordance between the BDI-II and the depressive module of the CIDI revealed an outstanding Cohen Kappa value of 0.927, p = < 0.001. The internal consistency of the instrument as measured by the Cronbach's α was 0.911. Estimation of the validity coefficients of the instrument across the range of threshold values revealed that a cut-off value of 18 had the optimal outcomes, with a sensitivity of 0.95, specificity of 0.97, false positive rate of 0.03, and a misclassification rate of 0.04. At lower values between 15 and 17, the ranges were from 0.77 to 0.89, 0.62 to 0.69, 0.19 to 0.31, and 0.11 to 0.24 for the sensitivity, specificity, false positive and misclassification rates respectively. While for higher values between 19 and 21,

the ranges for the sensitivity, specificity, false positive and misclassification rates were 0.46 to 0.74, 0.69 to 0.90, 0.10 to 0.31, and 0.18 to 0.38 respectively. These findings are depicted in table 4.

Analysis of the Receiver Operating Characteristic (ROC) curve also showed that the value of 18 had the largest area under the curve of 0.93. This was done by determining the threshold value with the greatest perpendicular distance from the diagonal on the ROC curve. The threshold of 21 had the least AUC of 0.65 while 17 had the second greatest AUC of 0.89. These are illustrated in figure 1.

TABLE 1: Sociodemographic Characteristics of the Respondents

Variable	Non-depressed Freq (%)	Depressed Freq (%)	Total Freq (%)	Statistics
		N = 303		
Sex				
Male	147(61.0)	17(27.4)	164(54.1)	**χ^2 = 22.390, df = 1, p = < 0.001** **
Female	94(39.0)	45(72.6)	139(45.9)	
Age grouping [Mean ± SD = (35 ± 8.204), Range = 18 – 54]				
≤ 19	6(2.5)	0(0.0)	6(2.0)	**χ^2 = 2.698, df = 3, p = 0.441**
20 – 29	53(22.0)	17(27.4)	70(23.1)	
30 – 39	107(44.4)	29(46.8)	36(44.9)	
≥ 40	75(31.1)	16(25.8)	91(30.0)	
Years of education [Mean ± SD = (8.45 ± 6.149), Range = 0 – 18]				
≤ 12	152(63.1)	45(72.6)	197(65.0)	**χ^2 = 1.961, df = 1, p = 0.161**
> 12	89(36.9)	17(27.4)	106(35.0)	
Occupational class				
Class I	21(8.7)	5(8.1)	26(8.6)	**χ^2 = 5.135, df = 4, p = 0.274**
Class II	36(14.9)	5(8.1)	41(13.5)	
Class III	36(14.9)	5(8.1)	41(13.5)	
Class IV	82(34.0)	25(40.3)	7(35.3)	
Class V	66(27.4)	22(35.5)	88(29.0)	
Marital status				
Single	52(21.6)	11(17.7)	63(20.8)	**χ^2 = 4.080, df = 4, p = 0.396**
Married	97(40.2)	26(41.9)	123(40.6)	
Widow	75(31.1)	18(29.0)	93(30.7)	
Separated	4(1.7)	0(0.0)	4(1.3)	
Divorced	13(5.4)	7(11.3)	20(6.6)	

** **Statistically significant finding**

TABLE 2: Clinical Profile of the Respondents

Variable	Non-depressed Freq (%)	Depressed Freq (%)	Total Freq (%)	Statistics
		N = 303		
Duration of seropositivity [Mean ± SD = 2.80 (± 1.792), Range = 1 – 8 years]				
≤1 year	50 (20.8)	41 (66.1)	91 (30.0)	**$\chi 2 = 48.333$, df = 2, p = < 0.001****
2 – 3 years	109 (45.2)	12 (19.4)	121 (40.0)	
≥4 years	82 (34.0)	9 (14.5)	1 (30.0)	
CD4 Count/µL [Mean ± SD = 278.78 (± 142.759), Range = 45 – 912]				
< 200	71 (29.5)	15 (24.2)	86 (28.4)	**$\chi 2 = 16.568$, df = 1, p = < 0.001****
200 - 399	120 (49.8)	46 (74.2)	166 (54.8)	
≥400	50 (20.7)	1 (1.6)	51 (16.8)	
CDC Stage of disease				
Stage I	2 (0.8)	0 (0.0)	2(0.7)	**$\chi 2 = 5.817$, df = 3, p = 0.121**
Stage II	18 (7.5)	1(1.6)	9(6.3)	
Stage III	136 (56.4)	31(50.0)	167(55.1)	
Stage IV	85 (35.3)	30 (48.4)	115 (37.9)	
History of psychiatric illness				
Absent	239(99.2)	46(74.2)	285(94.1)	**$\chi 2 = 55.055$, df = 1, p = <0.001****
Present	2(0.8)	16(25.8)	18(5.9)	
Family history of psychiatric illness				
Absent	236(97.9)	45(72.6)	81(92.7)	**$\chi 2 = 47.43$, df = 1, p = <0.001****
Present	5(2.1)	17(27.4)	22(7.3)	

** **Statistically significant findings**

TABLE 3: Logistic Regression Analysis of Variables With Significant Relationship With Depression

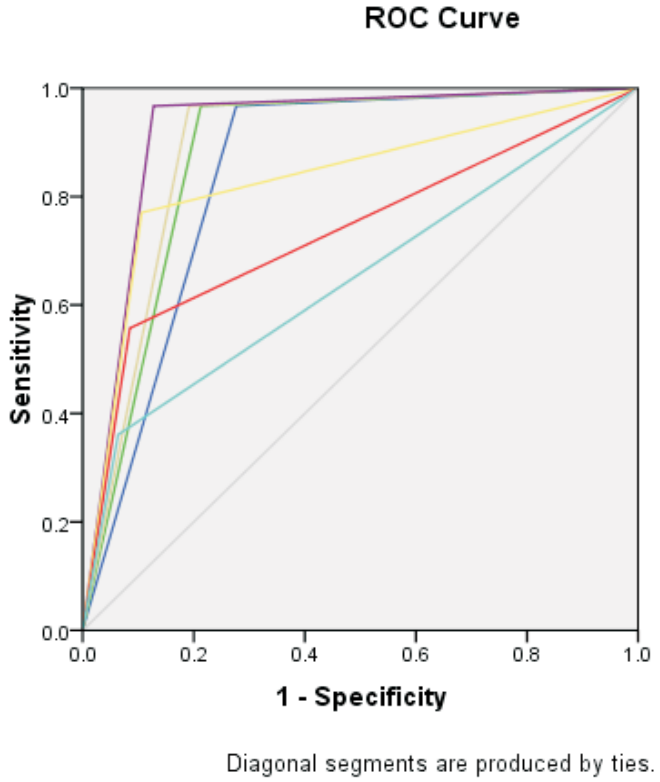
Variable	B	S.E.	Wald	df	Sig	Exp (B)	95% C.I. for Exp (B)
Sex	1.037	0.374	7.675	1	0.006**	2.820	1.354 – 5.870
Past history of Psych illness	3.154	0.892	12.488	1 s	<0.001**	23.420	4.074 - 134.650
Family history of Psych illness	2.063	0.677	9.283	1	0.002**	7.872	2.088 - 29.684
CD4 Count	0.180	0.288	0.392	1	0. 531	1.198	0.681 - 2.107
Duratn of HIV Seropositivity	1.103	0.272	16.467	1	<0.001	0.332	0.195 - 0.565

TABLE 4: Validity Coefficients of the BDI-II at Cut-off Scores of 15-21 For the Adults on Haart Screened (N=303)

Threshold	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Sensitivity	0.77	0.78	0.87	0.95	0.77	0.56	0.36
Specificity	0.62	0.71	0.79	0.97	0.80	0.89	0.93
Positive predictive value	0.81	0.84	0.86	0.91	0.89	0.87	0.86
Negative predictive value	0.75	0.79	0.90	0.96	0.75	0.64	0.53
False positive rate	0.38	0.29	0.21	0.03	0.20	0.11	0.07
Misclassification rate	0.14	0.11	0.10	0.04	0.18	0.29	0.39

Table 5: A Contingency Table Comparing the Beck's Depression Inventory II (BDI-II) To Depressive Disorder Module of the Composite International Diagnostic Interview (CIDI) as the Criterion

	CIDI DIAGNOSIS DEPRESSED	**CIDI DIAGNOSIS** NON-DEPRESSED	**TOTAL**
BDI DIAGNOSIS DEPRESSED	60	2	62
BDI DIAGNOSIS NON-DEPRESSED	3	69	72
TOTAL	**63**	**71**	**134**



Source of the Curve
bdi15
bdisum16
bdisum17
bdisum18
bdisum19
bdisum20
bdisum21
Reference Line

Area Under the Curve (AUC)

Variable(s)	**Area**
bdisum15	0.735
bdisum16	0.817
bdisum17	0.898
bdisum18	0.925
bdisum19	0.834
bdisum20	0.757
bdisum21	0.649

FIGURE 1 : Receiver Operating Characteristics (ROC) Curve at BDI-II Thresholds of 15 To 21

DISCUSSION

The prevalence of depression among the subjects on HAART was 20.2% based on BD-II cut-off score of 18. This translates to about every one out of five subjects included in the study had clinical depression. This finding is similar to the prevalence rate of 21% reported by Morrison et al in the USA. [39] It is however relatively lower than the rates of 28.7% and 38.7% reported by Adewuya et al and Olley et al, in southwestern Nigeria and South Africa respectively. [11, 12] This lower prevalence may be due to the assertion by Rabkin et al [40] that the availability of HAART causes significant reduction in psychological distress among HIV seropositive subjects. The subjects enrolled for this study have also spent sometimes living with the condition; the average duration since diagnosis was 2.80±1.79 years. In this case, they have developed some adaptive coping strategies which might be protective against the development of depression, while the previous studies included patients who were newly diagnosed, yet to commence therapy and come to terms with the reality of their diagnosis. When compared with the prevalence of depression of 3.3% in the general adult population in Nigeria, [41] however, the rate reported among the subjects on HAART in this study is significantly higher. The possible reasons for the difference include; the change in status of HIV infection to a chronic disorder and the associated distresses of living with it as well as the attendant significant life events such as losses in the form of death of spouses and children. The negative impact of stigma and the neuropsychiatric side effects of some of the antiretroviral medications could also be contributory. [42]

Logistic regression analysis revealed that female gender, past history of psychiatric illness, family history of psychiatric illness and duration of HIV seropositivity were significant predictors. Similar findings have been reported in previous studies with some degree of consistency as correlates of depression in HIV+ subjects. The likelihood of developing depression was about 3 times more among females than their male counterparts. This finding is similar to that of Gureje et al [41] in which a female to male ratio of 3:1 for vulnerability to depression was reported. The conspicuous reasons for this finding are; the additional psychosocial stresses faced by women living with such a socially stigmatizing disease and the possible role of hormonal factors associated with menstrual cycles, pregnancy and menopause. In terms of the past history of psychiatric illness, out of the 18 subjects with a history of same, sixteen developed clinical depression, thus the probability of developing depression among these subjects was about 23 times more than among subjects without similar history. This is because HIV diagnosis and its attendant inter-current complications and presentations can be potent triggers for depression especially in those with prior history as reported by Buchanan et al who made similar observation.[43] Also, family history of psychiatric illness in a first degree relation was found to be a significant predictor with a likelihood ratio of 1.2 in this study. This finding is consistent with family studies which have shown that the history of depression in the first degree relations of a subject naturally increases that subject's vulnerability. Genetic studies have also revealed that the risk of developing depression is increased in the first-degree relatives of both bipolar

and unipolar probands.[44] The genetic predisposition to the development of depression in HIV+ subjects might probably be exaggerated as observed in this study. Though, the duration of HIV seropositivity had a statistically significant relationship with the development of depression among the subjects, it did not increase their vulnerability to it. It can be deduced that the shorter the duration of the disease the more the prevalence of depression among the subjects. This is because, the longer the duration the more psychologically adjusted the subjects become.

A critical evaluation of the psychometric properties of the BDI-II in comparison to the CIDI revealed that its accuracy and effectiveness as a screening tool for depression among adults on HAART were outstanding. The degree of diagnostic concordance between the two instruments had a Kappa value of 0.93 and was statistically significant. Its internal consistency with a Cronbach's α of 0.911 was excellent and compares with the outcome of meta-analysis conducted by Beck et al [45] thus making it a reliable instrument for the detection of depression among the subjects. The validity coefficients of the instrument assessed at a cut-off score of 18 were also excellent across all parameters. The sensitivity of over 90% indicated that the BDI- II has an acceptable detection rate for depressed HIV seropositive subjects. It implies that the BDI - II can correctly diagnose 9 out of every 10 depressed HIV+ subjects. The specificity of about 97% showed that the instrument has a high capacity to discriminate those who are non-depressed from the depressed subjects. It means that if the instrument were administered to 100 non-depressed HIV+ subjects, 97 of them will have negative BDI-II diagnosis. The sensitivity value obtained was within the range of 81% to 100% reported by Myers and Winters in their systematic review while the specificity was higher than the range of 53% to 93% reported in that review.[46] The positive predictive value (PPV) of the BDI – II was 91% while the negative predictive value (NPV) was about 96%. Adapting the definitions of the PPV of a test as the proportion of subjects with positive test result who actually have the disease, and the NPV as the proportion of subjects with negative test result who do not have the disease, [47] it can be inferred hypothetically, that a subject who has a positive BDI – II diagnosis of depression has a 91% chance of actually having it while a subject without a BDI – II diagnosis has a 96% chance of not having depression. Thus, the outcomes in this study confer significant confidence on the predictive capacity of the instrument among subjects on HAART. The false positive rate (FPR) of 0.03 denoted that only 3 out of hundred HIV+ subjects that were screened with BDI – II will be falsely diagnosed as depressed while the misclassification rate of 0.04 meant that only about 4 out of 100 subjects will be wrongly classified by the instrument. Finally, based on the ROC curve analysis, 18 also had the greatest area under the curve, thus conferring on it the best discriminant ability of all the values analyzed which is in conformity with the outcome of earlier validity study conducted by Awaritefe in this environment.

Limitations of the study

The prevalence of depression among the subjects on HAART need to be interpreted with caution as other psychosocial

stressors such as the impact of stigmatization were not independently assessed. Also, the similarities between the biological symptoms of depression and some of clinical manifestations of HIV/AIDS may give higher BDI – II outcomes. Thirdly, since some of the validity coefficients of any instrument (e.g. Sensitivity and specificity) are dependent on the prevalence of the condition, there is the need for caution in the interpretation of the psychometric properties obtained in this study. Another limitation of the study is, the results are based on data that were generated cross-sectionally rather than longitudinally, hence cause and effect relationship could not be established.

CONCLUSIONS

Depression affects about one out of every five HIV+ subjects, thus making it one of the commonest psychiatric comorbidities among them. Factors that increase the vulnerability to depression include; female gender, past history of psychiatric ailment, family history of psychiatric illness as well as short duration of HIV seropositivity. From our evaluation, the BDI-II is a brief instrument that has excellent psychometric properties which make it suitable for the detection of depression among PLHIV in the busy clinics of sub-Saharan Africa. We therefore recommend the use of the BDI – II for the screening of vulnerable groups as part of their routine clinical assessments. This will enhance early detection of cases and the institution of early intervention in order to optimize patient care. ■

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ORIGINAL ARTICLE

SLEEP DISTURBANCES IN CHILDREN WITH ENLARGED TONSILS AND ADENOIDS

KOLO ES

ABSTRACT

Background: Sleep plays an essential and critical role in growth and development of children. The consequences of sleep disturbance in children include: impaired immunologic function, reduced alertness, deficits in cognition, memory and learning. **Objective:** This study aims to assess sleep disturbances in children with adenotonsillar enlargement.**Methods:** This is a preliminary report of a study on children with adenotonsillar enlargement at the Otolaryngologic clinics of Aminu Kano Teaching Hospital, Kano Nigeria. **Results:** A total of 38 consecutive patients with adenotonsillar enlargement were studied; 20 (52.60%) were males and 18 (47.40%) were females. Their ages were between 1 and 10years; the mean age was 3.67 $\pm$2.45years. The mean duration of symptom was 1.17 years (SD = 0.84). The overall mean sleep disorder score was 1.94 $\pm$ 0.15. The mean score for males was 1.66 $\pm$ 0.21 and that for females was 2.24 $\pm$ 0.19. The mean sleep disorder score for children $\leq$ 5years was 1.90 $\pm$ 0.15, while that for children > 5years was 2.04 $\pm$ 0.42. The mean score for children with snoring was 3.58 $\pm$ 0.26. There was no significant correlation between the age of the patients, duration of symptoms and the degree of snoring. **Conclusions:** This study found a good sleep health in children with adenotonsillar enlargement except for those children that presented with snoring as their primary complaint.

KEYWORDS : Adenoids, palatine tonsils, airway, sleep disorder.

INTRODUCTION

Sleep is an essential and critical component of health just as diet[1]. In other words, sleep plays an important role in metabolic regulation, emotional function, performance, memory consolidation, brain recuperation processes and learning[2,3]. On the other hand, sleep problems are known to have major health consequences in children such as: impaired immunologic function, reduced alertness, deficits in cognition, memory and learning and a reduced quality of life[1]. Moreover, the effect paediatric sleep disorder may not be limited to the child alone, but can impact on the well-being of the entire family.

Previous researchers have reported that sleep problems may affect about 10 – 45% of the paediatric population and common causes included: narcolepsy, obesity, allergies, asthma, gastric reflux and adenotonsillar hypertrophy[4,5,6]. In particular, the most common cause of obstructive sleep apnea in children is

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adenotonsillar hypertrophy[7]. Although the literature is replete with studies on other aspects of adenotonsillar disease in our environment, there is paucity of research on sleep disturbances in this group of children. Hence, the quest to find the effect of adenotonsillar enlargement on the sleep health of children in our setting. Previous studies on sleep health of children are almost exclusively outside our environment. This study aims to assess sleep disturbances in children with adenotonsillar enlargement.

MATERIALS AND METHODS

This is a preliminary report of a study on children with adenotonsillar enlargement at the Otolaryngologic clinics of Aminu Kano Teaching Hospital, North-Western Nigeria. The study was approved by the Institutional Review Board of the hospital. Also, informed consent was obtained from the parents or guardian of the children.

Consecutive patients attending ENT outpatient clinic with features of adenotonsillar enlargement and a moderate to severe obstruction of the nasopharyngeal airway by adenoids; based on subjective evaluation of their plain nasopharyngeal radiographs. The measurements were done about 1cm below the upper end of the soft palate; but in children less than 3 years this was reduced to about half a centimeter. Accordingly, if the airway is not narrower than the thickness of the soft palate, it is considered normal. When the airway obstruction by adenoid is narrower than the thickness of the soft palate but still wider than half the thickness of the soft palate, the airway is considered moderately obstructed, and when the airway is narrower than half the thickness of the soft palate, the airway is considered severely obstructed. Others were those with enlarged palatine tonsils (Brodsky's grade II or higher)[8,9]. Excluded were children with craniofacial abnormalities, neurological disorders and those with cardiac or renal disorders. The X-rays were taken with the patients in an erect position in the case of the cooperative child, or held and restricted by either an assistant/parent/guardian (they were shielded from radiation exposure by wearing a lead jacket), and the head was fixed in a true lateral position in an uncooperative child. The tube–cassette distance was 180 cm and the exposure time varied between 0.4 and 0.6 s. The radiographs were subjectively evaluated using the same type of viewing box (Kenex–Electro medical HD, Essex, England).

Subsequently, an open access questionnaire developed by Serres et al[10] was adapted and administered to all parents/guardians of the children at the time of diagnosis to obtain data in the sleep disorder and parents/guardian's concern domains. However, those who do not understand English had the questions interpreted in their preferred languages. They rated their children's' sleep problems on a 0 to 5 point scale (0 = no problem, 1 = almost never, 2 = sometimes, 3 = frequent, 4 = a lot, 5= it couldn't be worse) based on how severe they felt the symptoms affected their children. The total domain and the item scores were all recorded.

Data obtained were entered into a specialized form designed for this study. They were analyzed using the Statistical Package for Social Sciences computer software version 16. A low sleep domain

score indicates a better sleep health, while a high score indicates a worse one. The associations between variables were assessed using the non parametric Spearman's correlation coefficient. A significant correlation was considered to be 0.40 or greater. A P-value $\leq$ 0.05 was considered to be statistically significant.

RESULTS

A total of 38 children met the inclusion criteria and were analyzed. Their clinical and demographic characteristics are shown in table 1.

Table1: Clinical and demographic characteristics

Characteristics	Number (n)	Percentage (%)
Sex		
Male	20[a]	52.60
Female	18[b]	47.40
Age (years)		
Range	1 – 10	
Mean	3.67 (SD = 2.45; 95%CI, 2.87 – 4.47)	
Duration of disease (years)		
Range	0.2 – 4	
Mean	1.17 (SD = 0.84; 95%CI, 0.89 – 1.44	

[a,b] No significant difference $X^2 = 0.11$; P= 0.75
SD= standard deviation, CI= confidence interval

The overall mean sleep disorder score was 1.94 $\pm$ 0.15 (95% CI, 1.63 – 2.24). The overall mean disorder score for males was 1.66 $\pm$ 0.21 (95% CI, 1.22 – 2.10) and that for females was 2.24 $\pm$ 0.19 (95% CI, 1.84 – 2.65). The mean sleep disorder score for children $\leq$ 5years was 1.90 $\pm$ 0.15 (95% CI, 1.59 – 2.22), while that for children > 5years was 2.04 $\pm$ 0.42 (95% CI, 1.08 – 3.00).

Mean scores for each of the sleep disorder domains assessed in the study population is shown in table 2.

Table 2: Mean scores for individual sleep disorder

Domain	mean score	95% confidence interval
Snoring	3.58 $\pm$ 0.26	3.06 - 4.10
Choking	1.89 $\pm$ 0.26	1.37 – 2.42
Restless sleep	1.89 $\pm$ 0.27	1.34 – 2.45
Difficult waking	1.03 $\pm$ 0.18	0.66 – 1.40
Deep thorax	1.29 $\pm$ 0.23	0.82 – 1.76

Table 3 shows the mean score for snoring and parental concern

Table 3: Mean score for snoring and parental concern

Characteristics	Snoring	Parental concern
Sex		
Male	3.40 ± 0.35[a]	4.10 ± 0.32[c]
Females	3.79 ± 0.37[b]	4.61 ± 0.20[d]
Age group		
≤ 5years	3.55 ± 0.30[e]	4.28 ± 0.24[g]
> 5years	3.67 ± 0.53[f]	4.56 ± 0.29[h]

[a b] No significant difference Z=-0.99; P=0.32
[c d] No significant difference Z=-0.89; P=0.38
[e f] No significant difference Z=-0.30; P=0.76
[g h] No significant difference Z=-0.43; P=0.67

There was no significant correlation between the age of the patients and the degree of snoring (Spearman rho; r=-0.02, P=0.90). Also, there was no significant correlation between the duration of symptoms and the degree of snoring (Spearman rho; r=-0.20, P=0.24).

DISCUSSION

Even though the importance of a healthy sleep to normal paediatric growth and development is widely acknowledged, sleep research is rather new in our environment and especially here in Nigeria. Moreover, to the author's best knowledge, the nation (with the exception of Lagos) is yet to establish a standard sleep laboratory in other parts of the country. Regrettably, parents and at times health care providers do not notice these sleep problems nor consider them as health hazards.

In line with previous works[11], the present study found the mean age of the study population to be 3.67 years. Similarly, it has been reported that at about this age; the adverse effects of adenotonsillar enlargement were most severe [11]. That is to say, a good number of those who participated in this study might have exhibited the features of this disease sufficient enough to justify their referral to the otolaryngologist. Thus, increasing the sensitivity of the inclusion criteria used in the present study.

In this study, the overall sleep health of children with enlarged tonsils and adenoids was found to be satisfactory. Also, when the individual sleep parameters were investigated, their sleep health remained good irrespective of the children's age, sex and duration of symptoms except for those children that presented with snoring as their primary complaint. On the contrary, Vaher et al[12], in their study reported that children with adenotonsillar enlargement with sleep

disordered breathing had parasomnias. In addition, enlarged tonsils and adenoids are well known causes of obstructive sleep apnea[7]. The sleep disturbances exhibited by children that presented with snoring might partly due to the blockage or narrowing of the upper airway caused by enlarged tonsils and adenoids. Also, during sleep, this airway obstruction might further be aggravated by the enlarged tonsils and other relaxed tissues in the throat pressing down on the airway, narrowing it and causing snoring and sleep apnea. Hence, it stands to reason that children in the age bracket 4 – 5years and those whose symptoms are chronic should possibly have worse sleep disturbances since airway obstruction tend to be most severe in them than other sub-sets of sufferers. However, these observations are at variance with the findings in this study where neither age nor duration of symptom influenced the severity of snoring in these children.

Considering parental concern, this study found that parents and guardians were wary of their children's snoring problem irrespective of their age or gender. This finding corroborates that of Francesco et al[13], who reported similar observation in a quality of life study in children with adenotonsillar enlargement. Perhaps, the associated cessation of breath that occurs in some of these patients with sleep apnea could have frightened some parents and guardians. Moreover, the excessively loud snoring in some of these children might have caused a lot of anxiety and insomnia amongst parents and other family members alike.

In conclusion, this study found a good sleep health in children with adenotonsillar enlargement except for those children that presented with snoring as their primary complaint. However, these findings are not without some limitations. For instance, the scope of the sleep characteristics investigated in this study were rather limited compared to other studies cited in the literature. Furthermore, the relatively small sample size in this study was a draw back. As a consequence, these could have biased the findings in this study. Therefore, further prospective multi-center studies with large sample sizes under standardized settings using a polysomnography machine or a sleep laboratory will help provide more valid evidence. ■

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ORIGINAL ARTICLE

TEAR VOLUME AND STABILITY ACROSS THE PHASES OF THE MENSTRUAL CYCLE AMONG WOMEN IN BENIN CITY, NIGERIA.

EBEIGBE JA[1], IGHOROJE AD [2]

ABSTRACT

Background: The menstrual cycle has been reported to affect many physiological processes. While the effects of the menstrual cycle on ocular parameters have been studied extensively in Caucasian women, not much is known about its effect on tear volume and stability in Nigerian women. **Objective:** To investigate the changes in tear volume and stability during the different phases of the menstrual cycle in Nigerian women. **Methods:** A longitudinal study of one hundred healthy women with a regular cycle of 26 to 29 days was carried out. The women were between 20 to 35 years old with mean age of 30 ± 2.1 years. Tear volume was measured by the Schirmer's tear test, while tear stability was measured by the non invasive tear break up time (NITBUT**). Results:** The difference in mean tear volume across the phases of menstrual cycle was statistically significant (p = 0.001). Tear volume reduced during ovulation and rose again during the luteal phase. This difference was statistically significant (p=0.04). The difference in tear volume between the follicular phase and the luteal phase was not significant (p=0.3). Increase in mean tear stability between the follicular and ovulatory phases was marginally statistically significant (p=0.046). However, there was no statistically significant difference between the ovulatory and luteal phases (p=0.44). **Conclusions:** The findings of this study suggest that hormonal variation during the different phases of the menstrual cycle influence tear volume and tear stability in healthy young women of reproductive age. These changes may be clinically significant particularly in contact lens wearers where fluctuations in ocular parameter may alter the contact lens fit, leading to a possible change in comfort and reduced visual acuity.

KEYWORDS: Tears, menstrual cycle, hormones, follicular, luteal.

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INTRODUCTION

For most women, the menstrual cycle is an integral part of their lives and tends to affect many physiological processes, and exert a significant influence on variation in ocular functions[1,2]. Various authors[3-5] have investigated the influence of the menstrual cycle on various ocular and visual parameters. While some[5-8] had identified a protective role of the female sex hormones during the menstrual cycle on some ocular conditions such as dry eyes, others[9-11] had reported no effects on ocular or visual parameters.

Tears lubricate, nourish and protect the eyes from dust, irritants and infections[12]. Tears also keep the surface of the eye optically clear and smooth. The imbalances in the composition of tears, may either decrease tear production or encourage excessive tear evaporation. This situation can lead to tear film dysfunction, usually diagnosed as "dry eye"[13-15]. The tear film is a complex structure composed of tears, mucin and lipids. When the tear film becomes insufficient to support the surface of the eyes due to a lack of production of tears or a decrease in stability of tears, dry eye syndrome occurs[16,17]**.** The tear film coating the eye, known as the pre corneal film, has three distinct layers, from the most outer surface lipid layer to the middle aqueous layer and the innermost mucous layer[18].

Deficiency of any of the three layers of the tear film can lead to a 'dry eye' condition, causing anything from mild eye irritation to severe pain[19]. Interestingly, in some cases excessive tearing or watering of the eyes can be a symptom of a dry eye condition. This is because when, for whatever reason, there is an inadequate normal tear layer on the eye, irritation results[20,21]. This causes an overproduction of the lacrimal gland and a flooding of lacrimal fluid into the eye[22,23].

Dry eye is a very common condition among women. Women are said to be twice more likely to have dry eyes than men[23]. There are no readily accessible prevalence studies done in Nigeria, however, the prevalence of Dry eye syndrome (DES) has been reported to increase with age from 5.7% among women less than 40 years old to 9.8% der among women greater or equal to 75 years old [24]. Moss et al[25] reported a prevalence of 8.4% in postmenopausal subjects younger than 60 years to 19% in those older than 80 years. Research[8-11,21] suggests that dry eyes may be related to women's monthly cyclical changes in hormone levels, in particular, related to estrogen levels. Studies[26-28] suggest that the estrogen peak which occurs during the follicular phase is associated with impairment of tear production resulting in ocular dryness and inflammation.

The endocrine system exerts significant influences on the physiology and pathophysiology of the lacrimal gland[3, 4]. Androgens, estrogens and progestin have been identified in the tear film and their levels in the tears appear to correlate with those of the serum[9, 22]. Receptors for androgens, estrogens, progesterone and prolactin have been found in several ocular tissues of rats, rabbits and humans. These hormones regulate the immune system, secretary functions of lacrimal and the meibomian glands[3, 4, 23]. Thus the eye is a target organ for sex hormones. Rocha et al[24] reported that androgen, estrogen and progesterone receptors mRNAs were present in the epithelial cells of the lacrimal gland, meibomian gland, lid, palpebral and bulbar conjunctivae, cornea, uveal body, lens, and retina of humans. These observations demonstrate that sex steroid receptors mRNAs exist in a variety of ocular tissues. It has been suggested that these receptors in the eye might be target sites for androgens, estrogen and progestin; and also be susceptible to administered topical and systemic hormonal contraceptives[22]. Several authors[3, 4, 9] reported that these sex steroids (i.e. androgens, estrogens and progestin)

modulate the structural characteristics, functional attributes and pathological features of ocular tissues. These observations account for the gender-related differences in dry eyes[3].

Meibomian gland function is critically important in maintaining the health and integrity of the ocular surface[29]. This gland through its production and secretion of lipids, promotes the stability, and prevents the evaporation, of the tear film. The lacrimal gland promotes spreading of the tear film, the control of infectious agents and promotes osmotic regulation. This layer coats the aqueous layer, provides a hydrophobic barrier that evaporates and prevents tears spilling onto the cheek[24, 30]. Sex steroid hormones have been implicated in the structural and functional activities of this gland[31].

The purpose of this work was to determine if the cyclical variation in hormone levels in the different phases of the menstrual cycle has any influence on tear volume and tear stability in young Nigerian women of reproductive age.

MATERIALS AND METHODS

This study was part of a research thesis done in the Department of Physiology, University of Benin for the award of the Doctor of Philosophy (PH.D) degree. The thesis was on ocular changes in pregnant, premenopausal and postmenopausal women with participants recruited from the outpatient clinics of the University of Benin Optometry Clinic and the Department of Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City. This present study explored the effects of the different phases of the menstrual cycle on tear volume and stability among the premenopausal women and was independent of the other aspects of the thesis. This was a longitudinal study of one hundred menstruating women, aged 20-35 years, who visited the University of Benin Optometry Clinic as outpatients.

The women were selected by systematic random sampling using the list of patients attending the clinic as a sample frame. To be included, the women had to have regular menstrual cycles of 26-29 days. Excluded from the study were women who had irregular menstrual cycles, lid-gland dysfunction (blepharitis) ocular surface abnormalities and any other obvious ocular pathology. Women with history of systemic disease, ocular surgery, laser therapy and on any medications were also excluded as were contact lenses wearers, pregnant women, smokers, women under topical eye drops, and post-menopausal women. Exclusion criteria also included use of oral contraceptive pills, history of hypertension, cardiovascular abnormalities, diabetes mellitus and any ocular infections that could affect tear volume or stability. Ethical approval was obtained from the University of Benin Teaching Hospital Research Ethics Committee and informed consent from the women. Confidentiality was ensured by avoiding the use of identifiers of patients during data collection, using codes instead.

The women were screened for systemic and ocular diseases. Monocular direct ophthalmoscopy was done to rule out any diseases of the posterior segment. The women were examined for changes in tear volume and tear stability during the first

five days of the cycle (follicular phase), on the 13th to 15th day (ovulatory phase) and during the last five days (luteal phase) of their menstrual cycle. Only women having a regular 26 to 29 day cycle length were examined. The women were examined for 3 consecutive cycles and the mean value was recorded.

The findings of the various tests carried out and their implications were explained to the participants and they were counselled on appropriate measures or treatment necessary, where anomalies were found and on general eye care habits. All participants in this study had a free comprehensive ocular examination, besides that needed for their presenting complaints.

Measurement of tear secretion

Schirmer's tear test, which measures tear volume and the non invasive tear break up time (NITBUT) which measures tear stability were carried out on the women. The Schirmer's test strip was used for this test. This is a 35mm by 5mm filter paper that is calibrated in mm and is used to measure the amount of tears produced over a period of 5 minutes. The patient was comfortably seated on a chair in a room with ambient illumination. The fan and/or air conditioning system was turned off to avoid environmental interference with the Schirmer's tear test values. With the subject looking up, the lower eyelid of the right eye was pulled down and the tip of the Schirmer's test strip was inserted at the junction of the middle and lateral third of the lower eyelid of right eye with care so as not to touch the cornea and elicit a tearing response. With the Schirmer's test strip in place in the right eye, the stop watch was set. After five minutes, the Schirmer's test strip was carefully removed from the eye and the amount of wetting read off. Values less than 10mm in 5 minutes are indicative of poor tear production or volume.

Measurement of tear stability

The noninvasive tear break up time was done with a hand held keratoscope. It is noninvasive because the eye is not touched. Measurement is achieved by observing the breakup of keratometer mire (the reflected image of keratometer grid). The clinician focuses and views the crisp mires, and then records the time taken for the mire image to break up (NITBUT). NITBUT measurements are longer than fluorescein break up time. NITBUT values of < 10 seconds are consistent with dry eyes. NITBUT are considered to be more patient-friendly, repeatable and precise.

Sample size calculation

This was done using the formula[32]

$$n = \frac{Z^2 P(1-P)}{d^2}$$

n= sample size

Z=Z statistic for a level of Confidence of 95% (1.96)

P= maximum reported prevalence or proportion of dry eyes (5.7%)[25] =0.057

d= Precision desired (5%, d=0.05)

Therefore:

$$n = \frac{1.96^2 \times 0.057(1-0.057)}{0.05^2} = 82$$

This implied that a minimum sample size of 82 was required; hence the decision was taken to recruit 100 women to enhance the power of the study.

Statistical Analysis

Data was analyzed with GraphPad InStat (Statistical graphics incorporation, USA). Comparison of data among the different

phases was performed with one-way analysis of variance (ANOVA), and test between phases with the student's t-test.

RESULTS

Difference in mean tear volume across the phases of menstrual cycle was statistically significant, p = 0.001. Tear volume reduced during ovulation and rose again during the luteal phase. This difference was statistically significant, (p=0.04). The difference in tear volume between the follicular phase and the luteal phase was however not significant, p=0.3 (Table 1).

Increase in mean tear stability during the follicular and ovulatory phases of the menstrual cycle was statistically significant, p=0.046. However, there was no statistically significant difference between the ovulatory and luteal phases, p=0.44. This is shown in Table 2 and Figure 2.

Table 1: Changes in Tear Volume during the Menstrual Cycle

Statistics	Follicular	Ovulation	Luteal
MTV(mm)	24.76	17. 54	21.14
SD	8.91	9.42	10.60
SEM	1.26	1.33	1.50
Minimum	12.00	11.00	12.00
Median	35.00	14.50	20.00
Maximum	35.00	35.00	35.00
N	**100.00**	**100.00**	**100.00**

MTV=Mean tear volume, SD=Standard deviation, SEM=Standard error of mean, N=Sample size

Table 2: Changes in Tear Stability during the Menstrual Cycle

Statistics	Follicular	Ovulation	Luteal
MTS (sec)	13.70	16.32	17.44
SD	7.76	10.03	10.79
SEM	1.10	1.42	1.53
Minimum	5.00	7.00	7.00
Median	13.00	13.00	17.00
Maximum	59.00	60.00	68.00
N	**100.00**	**100.00**	**100.00**

MTS=Mean tear stability

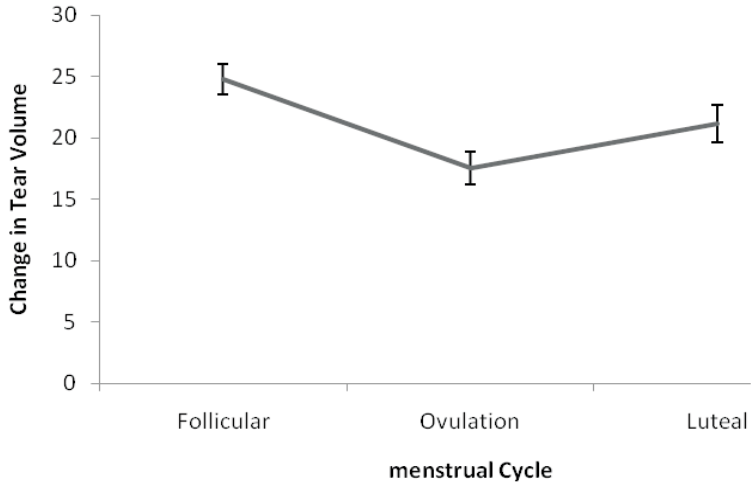

Figure 1: Changes in Tear Volume during the Menstrual Cycle

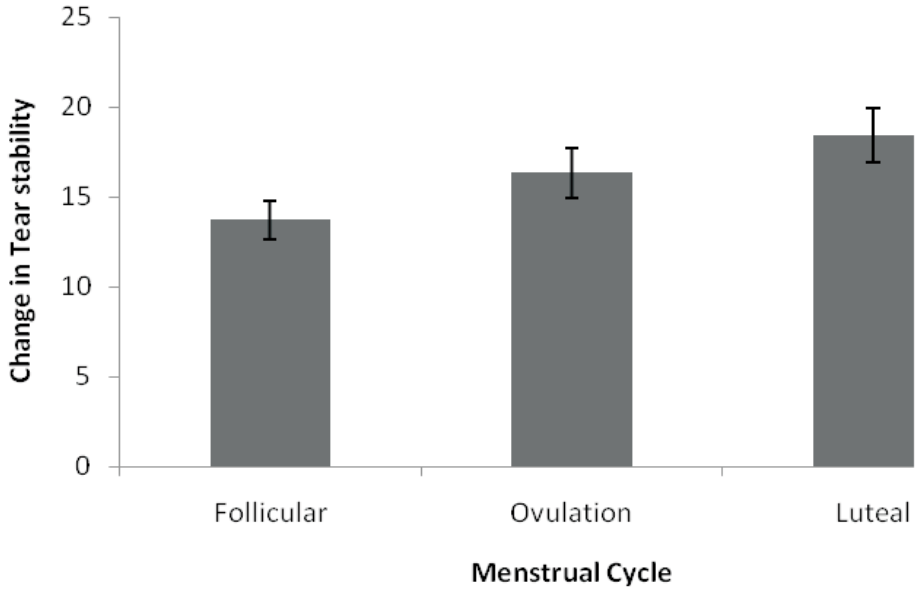

Figure 2: Changes in Tear Stability during the Menstrual Cycle

DISCUSSION

The cyclical variation in ovarian hormonal levels during the menstrual cycle is associated with transient ocular changes. In this study, it was observed that there was increase in tear stability across the three phases of the menstrual cycle, with the highest occurring during the luteal phase. The difference in tear stability between the follicular and ovulatory phases was significant, while that between the ovulatory and the luteal phase was not statistically significant. This study agrees in part with the Nigerian study by Iwaugwu[6], which reported a significant increase in tear stability in the follicular and ovulatory phases, but no significant difference between the ovulatory and luteal phases. This result is also consistent with studies in developed countries [14, 15] that reported tear stability to be significantly higher in ovulatory and luteal phases. Similarly, our findings agree with the results of the work by Nancy[11] which reported an increase in tear stability in the follicular stage and concluded that there was no significant difference in stability during the ovulatory and luteal phases. The findings are also consistent with that of Patel et al[15], who concluded that tear production and stability are related to hormonal fluctuations in menstrual cycle. However, the results obtained from this study do not agree with the findings of Tomlinson et al[18] who reported no effect on tear stability induced by either use of oral contraception or by normal cyclic hormonal variations. While the methodologies in this study and that by Tomlinson et al[18] are similar, Tomlinson et al[18] recruited only 18 cases and controls. It is, therefore, likely that the differences in sample size, sampling techniques and racial constitution of the two studies explain the differences in findings.

A major reason for changes in tear stability during the menstrual cycle has been reported to be the effects of estrogen on the meibomian gland. The meibomian gland secrets the tear film's lipid layer and is very important in preventing the evaporation of the tear film and maintaining its stability, thus it is likely that an increased hormonal influence on the functions of the meibomian gland would cause an improvement in tear stability and a decreased hormonal influence on the meibomian gland will cause a decline or deterioration in tear stability[15,16].

A marked reduction in tear volume was recorded at ovulation. This increased significantly during the luteal phase. There was significant difference in mean tear volume between ovulatory and luteal phase. Estrogen and progesterone are the hormones secreted at these phases and are suspected to be the cause of increase in tear volume.Studies[17,18] have suggested that progesterone may help protect against dry eye condition. Tear stability was significantly high in the luteal phase meaning a less likelihood of dry eye condition. Previous studies[14-16] have suggested that estrogen has an effect on the lacrimal glands, meibomian glands, eyelids, palpebral and bulbar conjunctiva and the cornea, this indicates that changes in tear stability may result from a complex hormonal influence. There is the probability that estrogen could be acting directly on the meibomian gland and influencing its secretions. The estrogen peak which occurs during the follicular phase is associated with impairment of tear production[20].

Observations in patients taking anti androgen therapy are consistent with the hypothesis that androgen deficiency is a

critical etiological factor in the pathogenesis of meibomian gland dysfunction and evaporative dry eye[19,20]. In further support of this hypothesis are the findings that reduced serum levels of testosterone are more prevalent in women with dry eye and correlate with the subjective severity of ocular symptoms, serum levels of total androgens decline during menopause and aging in both sexes and these time periods coincide with an increased appearance of meibomian gland dysfunction and dry eye[13-15].

As an additional consideration, this apparent inter relationship between androgen deficiency, meibomian gland dysfunction, and dry eye might help to explain why systemic androgen administration has been reported to alleviate the signs and symptoms of dry eye. Given these results, it is possible that efforts directed at alleviating this endocrine imbalance like topical application of androgens may prove beneficial as a treatment for meibomian gland dysfunction and the associated evaporative dry eye, in androgen-deficient individuals[22,24].

Limitations of the study

The limitations of this study include the fact that the authors did not find any prevalence studies on dry eye syndrome in Nigerian women hence the calculation of sample size was done using prevalence rates reported in Caucasian women. The implication is that there is a possibility that if prevalence rates in Nigerian women are different and possibly higher, the sample size utilized in this study may have been inadequate to give power to the study. In addition, the study assumed that the women ovulated between the 13-15th days of their cycle. There is a possibility that some ovulated earlier or later. While the authors recognized that it would have been more appropriate to confirm ovulation using hormonal assays, this requires collection of blood samples which may not have been acceptable to many of the women presenting for outpatient consultations making participant recruitment difficult. In addition, the results of the assays are not usually immediately availability and this would have increased both the cost and duration of the project. It is hoped that our findings will stimulate further studies including those in which ovulation is definitively confirmed.

CONCLUSION

The findings of this study suggest that hormonal variation that occur during the different phases of the menstrual cycle influence tear volume and tear stability in healthy young women of reproductive age. These changes may be clinically significant particularly in contact lens wearers where fluctuations in ocular parameter may alter the contact lens fit, leading to a possible change in comfort and reduced visual acuity. ▬

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ORIGINAL ARTICLE

LOW VISION SERVICES IN SOKOTO STATE, NIGERIA

ADAMU MD, MUHAMMAD N

ABSTRACT

Background: The provision and uptake of low vision services is said to be poor globally and is almost negligible in low income countries. **Objective:** To describe the first one year of low vision service provision in Sokoto state. **Methods:** A retrospective review of all patients with low vision referred to the low vision unit of Usmanu Danfodiyo University Teaching Hospital and Specialist Hospital, Sokoto during the study period was undertaken. The WHO definition of low vision using visual acuity cut off point (best corrected visual acuity of <6/18 to light perception in the better eye) was used to enlist study participants. Data was extracted from the medical records of all the patients diagnosed with low vision. The information extracted included age, sex, socio-demographic details, presenting and best corrected visual acuities for near and distance, diagnosis, the spectacles and low vision device prescribed. Data was analyzed using simple percentages and proportions. **Results:** A total of 46 patients (0.45% of all patients seen -10,201) were diagnosed with low vision. The sex distribution was 65.2% males and 34.8% females. The age range of the patients was from 9 years to 69 years with a mean age of 29.3 ± 1.66 years. The major causes of low vision in this study were glaucoma (52.2%), retinitis pigmentosa (26.1%), optic atrophy (8.7%), pathologic myopia (6.5%) and albinism (2.2%) . The most prescribed devices were spectacle magnifiers and telescopes (41.3% both) followed by handheld magnifier (13%) and stand magnifier (4.3%). The most dispensed devices were spectacle magnifiers and telescope at 41.6%, handheld magnifiers 12.5%, and stand magnifiers 4.2%. **Conclusions:** Low vision service provision in Sokoto state is one of the challenges of eye care service provision in the state. The commonest cause of low vision was found to be glaucoma while Spectacle magnifiers and Telescopes were found to be the commonest prescribed and dispensed low vision devices.

KEYWORDS: Vision, Services, Spectacles, Vision device.

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INTRODUCTION

Low vision has been described with variety of terms including partial sight, visual impairment and visual disability[1]. It describes a situation where a person has difficulty with activities of daily living (ADL) even with regular glasses, medicine or surgery, such that reading, writing, watching television or mobility are difficult to be achieved. In order to identify persons who could benefit from low vision services, a definition for low vision was

agreed by a WHO-stakeholders meeting in Bangkok, Thailand and it states that: "A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task"[2]. This definition incorporates both visual acuity and visual field in the better eye to standardize the definition for global usage. The WHO recent estimate project about 37 million blind, 314 million visually impaired, and 124 million people with low vision (with presenting vision)[3]. The causes include cataract (47.8%), glaucoma (12.3%), and age related macular degeneration (8.7%) among others[3,5]. In Nigeria, the National Blindness and Low Vision Survey estimated over 4.2 million people with low vision and 1 million with blindness with causes similar to the global estimates by the WHO.

The provision (and uptake) of low vision services is said to be poor globally and is almost negligible in low income countries[5,6]. This has been attributed to lack of awareness of service among the general public and eye care professionals, acceptance of low vision; and transport[7]. A global survey of low vision services showed 115 countries with some low vision services; and approximately half of the countries in Africa and Western Pacific regions have no service[5]. Only few countries have more than 10 low vision health professionals/10 million of population and NGOs were found to be the main providers and funders of the service[5].
The low vision service in Sokoto state on commenced in 2011 with the training of personnel in two hospitals within Sokoto metropolis (Specialist Hospital and Teaching Hospital) and acquisition of low vision devices. The low vision services were integrated into the Sokoto State Eye Care Programme and the Programme procured the low vision devices with support from a non-governmental international organization. This paper reports the first year of low vision service provision in Sokoto state. The specific objectives are: to determine the common causes of low vision in the study population; to determine the commonly prescribed low vision devices; and, to determine the commonest dispensed low devices.

MATERIALS AND METHODS

A retrospective review of all patients with low vision referred to the low vision unit of two hospitals (a Federal Teaching Hospital and a State Specialist Hospital) during the study period was undertaken. In each of the clinics, persons diagnosed with low vision after appropriate medical and/or surgical treatments with standard refraction were referred to the trained low vision therapist (Optometrist in Teaching Hospital and Ophthalmologist & Ophthalmic nurse in the State Hospital) for low vision assessment of both near and distance vision. The patients were assessed with the appropriate low vision devices depending on the visual needs of the person after which an appropriate device is prescribed separately for near or distance vision tasks or both. The devices used for assessment include low vision acuity and contrast charts, magnifiers and telescopes. The Programme provides the low vision devices to the eye clinics that dispense the devices at a subsidized cost as accepted by

the patients and/or guardians. The inclusion criteria were a best-corrected Visual acuity (VA) of <6/18 to light perception in the better eye; and an Ophthalomologist's diagnosis of low vision.. The exclusion criteria included patients with VA of no light perception referred to the unit for rehabilitation.

Ethical approval was obtained from the Ethics and Research committee of Usmanu Danfodiyo University Teaching Hospital, Sokoto. To ensure confidentiality, patients identity were hidden and case notes were promptly returned to the medical records library.

Data extracted included age, sex, socio-demographic details, presenting and best corrected visual acuities for near and distance, diagnosis, the spectacles and low vision device prescribed.

Data was analyzed using descriptive statistics of simple percentages and proportions using SPSS version 13.0 . Chi-square was used to test the significance of the differences between the variables where applicable. Statistical significance was set at P <0.05.

RESULTS

Of the 10,201 patients seen during the study period (June 2011 to July 2012), a total of 46 (0.45%) were diagnosed with low vision.

Males (65.2.%) constituted the majority. The age range of the patients was from 9 years to 69 years with a mean age of 29.3 ± 1.66years. Most (55%) of the patients seen were less than 30 years of age as shown in table I. Majority of the patients were students (32.9%) followed by civil servants (23.6%), housewives (10.9%), – traders (10.3%), journalists (8.6%), farmers (8.7%) and others (4.7%).

Tables II and III shows the distance and near acuities of the patients respectively. Only 45.7% of the patients had an acuity of <6/18-6/60 with the presenting distance vision that increased with low vision correction to 82.6% of the patients. The presenting near acuity was Normal –up to 1.5M (N12) in 48% of the patients that increased to 87% with low vision correction.

The causes of low vision are shown in Fig 1 with Glaucoma (52.2%), Retinitis pigmentosa (26.1%), and optic atrophy (8.7%) accounting for 87% of the cases.

The most prescribed devices were spectacle magnifiers and telescopes (41.3% each) as shown in table IV. However, only 52.2% of prescribed low vision devices were dispensed spectacle magnifiers and telescopes (41.7%) constituting the majority as shown in table IV.

The characteristics of persons that accepted the low vision devices are shown in table V with patients aged 20-29 years accepting more than others (37.5%). Those aged <10 years and >50 years did not accept any LVD. Majority of the patients that accepted the LVDs were students (43.2%), civil servants (35.3%) and others (traders, artisans, and journalists) constituted 21.5%. Chi-square test was conducted for age, sex and occupational distribution for patients that accepted LVDs which showed no statistically difference in the age ($\times^2$ 2.8, p= 0.82), sex ($\times^2$ 3.2, p=0.77) or occupation ($\times^2$ 7.1, p=0.08).

Table I: Age and sex distribution of the patients

Age group (yrs)	Male (n)	Female (n)	Total n	(%)
0-9	**2**	**-**	**2**	***(4.3)***
10—19	**4**	**7**	**11**	***(24)***
20-29	**10**	**3**	**13**	***(28.2)***
30-39	**6**	**3**	**9**	***(19.6)***
40-49	**5**	**1**	**6**	***(13.0)***
50-59	**3**	**1**	**4**	***(8.7)***
60+	**-**	**1**	**1**	***(2.2)***
Total	**30** ***(65.2%)***	**16** ***(34.8)***	**46**	***(100)***

Table II: Distance visual acuity at presentation and after correction

Distance visual acuity	Presenting n (%)	LVA corrected n (%)
<6/18-6/60	21 *(45.7)*	38 *(82.6)*
<6/60-3/60	15 *(32.6)*	7 *(15.2)*
<3/60-PL	10 *(21.7)*	1 *(2.2)*
Total	**46 *(100)***	**46 *(100)***

Table III: Near visual acuity at presentation and after correction

Near visual acuity	Presenting n (%)	LVACorrected n (%)
Normal up to 1.5M	22 *(48)*	40 *(87)*
>1.5M-2.5M	14 *(30)*	4 *(9)*
Very large->2.5M	10 *(22)*	2 *(4)*
Total	**46 *(100)***	**46 *(100)***

Table IV: Low Vision Device Prescribed and Dispensed

Type of device	Prescribed N (%)	Dispensed n (%)
Telescope	19 (41.3)	10 (41.7)
Spectacle Magnifier	19 (41.3)	10 (41.7)
Handheld Magnifier	6 (13.0)	3 (12.5)
Stand Magnifier	2 (4.3)	1 (4.2)
Total	**46 (100)**	**24 (100)**

Table V: Age and sex Distribution of Patients that accepted LVD.

Age Group (yrs)	Male n	Female n	Total n (%)
0—9	-	-	-
10—19	4	2	6 (25)
20—29	6	3	9 (37.5)
30—39	5	1	6 (25)
40—49	2	1	3 (12.5)
50—59	-	-	-
60+	-	-	-
Total	**17**	**7**	**24 (100)**

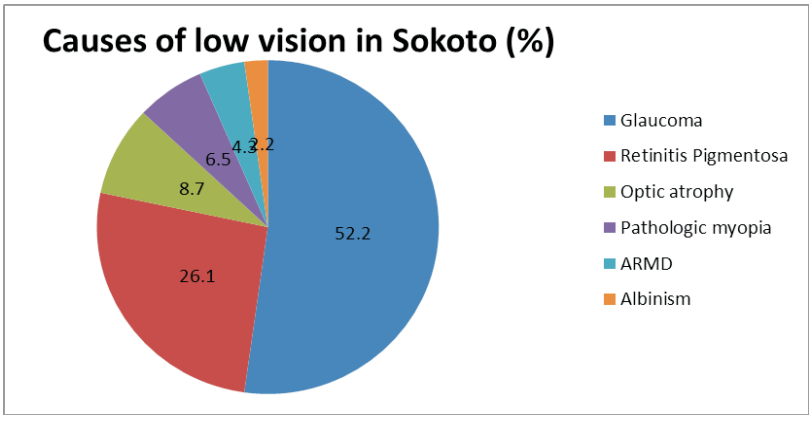

Fig 1: Causes of low vision in Sokoto

DISCUSSION

The problem of low vision is said to be worse among the working population and therefore gives a significant economic impact particularly in the developing world[8]. This is in accordance with the findings of our study which shows that more than half of the patients with low vision are within the working age group of 15yrs-60yrs.

This study also revealed that males most commonly access low vision services . This agrees with the findings of other studies[8,10]. This may be because the males have the economic power and are decision makers in our patriarchal society and will go extra miles to access eye care services in order to discharge their duties and responsibilities.

The commonest cause of low vision in this study was glaucoma followed by retinal disorders, age related macular degeneration, albinism and optic atrophy. This is comparable to reports from Kan[8] and Calabar[10] in Nigeria and emphasizes the emergence of glaucoma as an important cause of low vision in Nigeria. This perhaps may be due to the late presentation to the hospital of patients with glaucoma. On the contrary, studies from developed countries show that the commonest cause of low vision is age related macular degeneration with glaucoma and other retinal disorders each accounting for 10% or less[11,12] . This may be due to the fact that glaucoma is commoner in the black race and is also more aggressive making it commoner in the developing countries. Increased awareness and access to eye health care may also explain why glaucoma is less common as a cause of low vision in the developed countries.

The most prescribed low vision devices in this study are comparable to the findings in Kano[8] and Calabar[10] but different from that reported in Brazil[13]. Although the percentage of dispensed low vision devices is low in our study, it is higher than the 30% reported in the Calabar study[10] and may be due to the fact that the prices of low vision devices are subsidized in Sokoto state. The absence of a significant difference in acceptance of LVDs in our study is similar to the findings in U.S.A that reported no statistically significant difference in age and sex with acceptance of LVDs[14].

The data from this study revealed that more than 80% of low vision patients had improved vision for distance and/or near visual acuities with the aid of spectacles, telescopes and magnifiers. This finding is similar to the report from India[15] and West Africa[16] which showed more than 50% of low vision patients having improvement with the help of low vision devices.

The short period of service availability, location of the two centers in the state capital, lack of an effective referral system, and the small number of clients seen in this study may be a limitation in applying our findings to the general population especially that some eye care personnel in district hospitals may not have been aware of its availability. It is recommended therefore, that awareness creation on low vision service, human resource training including task shifting, and creating more low vision service centers in district hospitals could reach rural populace. Future quantitative and qualitative studies may be needed to assess determinants of LVDs acceptance, the change in quality of life of these patients and the probable economic impact to the community especially with an anticipated increased

uptake of low vision services in Sokoto state.

CONCLUSION

Low vision service provision in Sokoto is challenging as the commonest causes of low vision are glaucoma and retinitis pigmentosa which are difficult to manage. The most common low vision devices prescribed and dispensed are spectacle magnifiers and telescopes and these hold great promise as patients show improvement in vision with their use. ■

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PATTERN OF PRESENTATION OF ROAD TRAFFIC ACCIDENT INJURIES AT BENUE STATE UNIVERSITY TEACHING HOSPITAL MAKURDI, NORTH CENTRAL NIGERIA.

YONGU WT, ELACHI IC, KORTOR JN, MUE DD, GAJIR T

ABSTRACT

Background: Road traffic accidents are emerging as a global public health concern but not enough attention is given to it in terms of public health enlightenment and strategic policies by governments to achieve sustained control. **Objective:** This study is aimed at identifying the characteristics of injuries presenting in this new teaching hospital following road traffic accidents (RTAs) and determining the common causes of these crashes. **Methods:** This was a prospective study designed for all patients who presented to the Accident and Emergency Department of Benue State University Teaching Hospital following RTA over 12 months (July 2012 to June 2013). A questionnaire was filled at presentation and completed at the time of discharge from the hospital. **Results:** There were a total of 58 patients 31 males and 27 females giving a ratio of 1.1:1. The mean age was *33.25 ±14.90 (*Range 2 – 82years). Most 37(63.8%) of them were within the age range 21 to 40 years. The month of July 2012 recorded the highest number of patients 14(24.1%). Most of the accidents 35(60.3%) resulted from vehicle-vehicle collision and buses 24(41.4%) were the commonest vehicles involved in road traffic crashes followed by motorcycles 18(31.1%) and cars 14(24.1%). Majority of the patients were passengers 33(56.9%) and multiple injuries were recorded in 32(55.2%) followed by lower limbs only in 12(20.7%). Fractures occurred in 44(75.6%) of the patients followed by lacerations 9(15.5%), dislocation 2(3.2%) and others 3(5.2%). Complete recovery occurred in 32(55.2%) and were discharged. Eight (13.8%) were referred, 5(8.6%) recovered but with some residual deformity at the time of discharge, 3(5.4%) patients died and 8(13.8%) discharged against medical advice (DAMA). *Thirty three* patients had multiple injuries with an average injury severity score (ISS) of 13.7 range (2-32). Major injuries with ISS > 15 occurred in 16 patients. **Conclusions:** Fractures and lacerations were the commonest injuries sustained following RTA. Most of the patients had multiple injuries leading to death in 3 patients. There is need to further equip and prioritize the resources available to the hospital to cater for the growing percentage of multiply injured patients.

KEYWORDS: Road Traffic Accidents, Multiple injuries, Epidemiology.

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INTRODUCTION

Trauma care research in Nigeria is still evolving with few documented data mostly in the southern part of the country. There are no institutional and regional trauma registries[1] so obtaining data on some of these injuries can be challenging.

According to the WHO, worldwide each year, 1.2 million people are killed and 50

million are injured in road traffic accidents. The cost to low income countries is approximately 1% of their gross national product, more than the total development aid received by these countries[2]. This shows that close attention has to be paid to this epidemic by governments and non governmental agencies especially in the developing world in order to reduce morbidity and mortality from road traffic accidents. Developing countries bear the brunt of the fatalities and disabilities from road traffic crashes accounting for more than 85 per cent of the world's road fatalities and about 90 per cent of the total disability adjusted life years (DALYs) cost due to road injuries[3].

Also in Africa, it has been estimated that 59,000 people lost their lives in road traffic crashes in 1990 and that this figure rose to 144,000 people by 2010, a 144 per cent increase[4]. Statistics has shown that mortality in road traffic accidents is very high among young adults in their prime and who also constitute the workforce.[5,6]

The establishment of law enforcement agencies in some countries has not significantly helped the situation. In Nigeria for example, the mandate of the Federal Road Safety Commission established in 1988 includes ensuring law enforcement, collecting road accident statistics, revising traffic legislation, promotion of road safety education, ensuring adequate provision of medical facilities for traffic injury victims, undertaking research in road safety and coordination of all road safety activities. At the first African Road Safety Congress in Nairobi in 1989, Nigeria was ranked ahead of other African countries in the mortality rate on its highways with "the chances of a vehicle killing someone in Nigeria being 47 times higher than in Britain" [7]. It is also evident that Nigeria is worse than most other countries in terms of traffic accidents, in spite of her relatively good road network. As at 2004 World Bank report asserts "from the view – point of road development, Nigeria would no longer be regarded as a developing country". But unlike in most countries where improved road development and vehicle ownership (as barometers of economic advancement) is accompanied by better traffic management, higher road safety awareness, and a relative decrease in the number of motor accidents, the opposite is true of Nigeria[8]

According to the Nigerian Federal Road Safety Corps (2006), between 1970 and 2001, Nigeria recorded a total of 726,383 road traffic accidents resulting in the death of 208,665 persons and 596,425 injuries. In that period, each succeeding year recorded more accidents, deaths and injuries. Also between 1997 and 2002, Lagos State alone recorded a total of 39,141 road accidents resulting in the death of 10,132 persons and 18,972 injuries[9]. The Nigerian accident pattern seems to suggest that the better the road, the higher the accident and fatality rate as well as the severity and non-survival indices because of driver noncompliance with speed limits.[10,11,12].

This study was conducted to ascertain the injury pattern following road traffic accidents presenting at the Benue State University Teaching Hospital and to ascertain the com mon causes of these accidents.

MATERIALS AND METHODS

This was a prospective study recruiting all patients who presented to the Accident and Emergency Department of Benue State University Teaching Hospital following RTA over a 12 months period(July 2012 to June 2013) with major injuries (requiring admission).

A questionnaire was filled at presentation by the attending medical officer after resuscitation and completed at time of discharge or referral from the hospital. The data included age, sex, the status of victim (driver, passenger or pedestrian), the event that led to the accident(vehicle –vehicle collision, burst tyre, vehicle-pedestrian collision), the vehicles involved, the injuries sustained, the body regions involved and the outcome after treatment. The data was analyzed using SPSS 16.Ethical clearance for the study was obtained.

RESULTS

There were a total of 58 patients 31 males 27 females giving a ratio of 1.1:1. The mean age was *33.25±14.90 years* (Range 2-82years). Most 37(63.8%) of them were within the age range of 21 to 40 years (FIGURE1). The month of July 2012 recorded the highest number of patients 14(24.1%) because of a mass casualty situation in that month involving 7 members of National Youth Service Corps (NYSC) after orientation camp in the state .

Most of the accidents 35(60.3%) resulted from vehicle-vehicle collision. This was followed by loss of control 20(34.5%) and burst tyre 2(3.4%). Buses 24(41.4%) were the commonest vehicles involved in road traffic crashes followed by motorcycles 18(31.1%) and cars 14 (24.1%) (FIGURE 2) . Majority of the patients were *passengers 33 (56.9%) (TABLE 2)* and multiple injuries were recorded in 32(55.2%) followed by lower limbs only in 12(20.7%) (FIGURE 3). Fractures occurred in 44(75.6%) of the patients followed by lacerations 9(15.5 %) dislocation 2(3.2%) and others 3(5.2%) (FIGURE4*). Thirty two(55.2%)* recovered completely and were discharged, 8(13.8%) were referred, 5(8.6%) recovered but with some residual deformity at the time of discharge, 3(5.4%) patients died and 8(13.8%) discharged against medical advice (DAMA) .

Thirty three patients had multiple injuries with an average injury severity score (ISS) of 13.7 range (2-32). Major injuries with ISS >15 occurred in 16 patients.

TABLE 1: Age Distribution

Age	Frequency	Percent
11-20	6	10.3
21-30	23	39.7
31-40	14	24.1
41-50	7	12.1
51-60	4	6.9
61-70	1	1.7
71-80	1	1.7
81-90	56	96.6
Not indicated	2	3.4
Total	**58**	**100.0**

TABLE 2: Status of Patients and the Type of Vehicles Involved.

		TYPE OF VEHICLE				
		Car	**Bus**	**Motorcycle**	**others**	**Total**
Status of Patient	Driver	3(5%)	1(1.7%)	15(25.8%)	0(0%)	19(31.9%)
	Passenger	8(13.8%)	22(38%)	2(3.4%)	1(1.7%)	33(56.9%)
	Pedestrian	3(5%)	1(1.7%)	1(1.7%)	1(1.7%)	6(11.2%)
Total		**14(23.9%)**	**24(41.5%)**	**18(31%)**	**2(3.6%)**	**58(100%)**

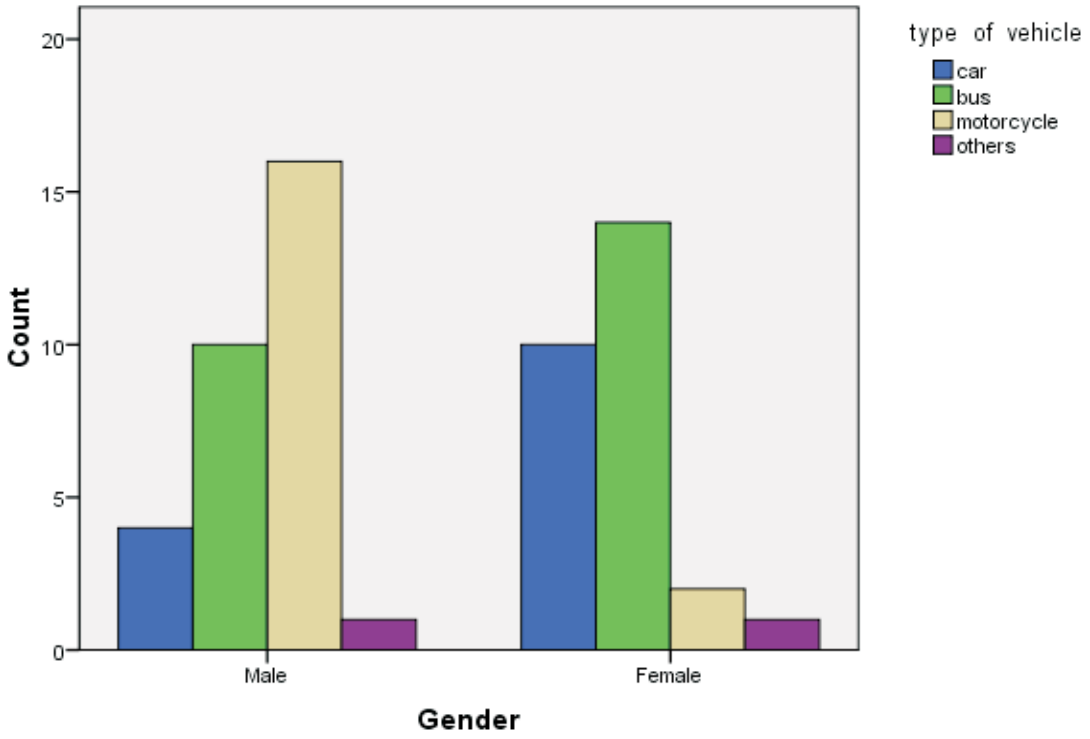

FIGURE 1: Vehicles Involved In Road Traffic Accidents by Gender.

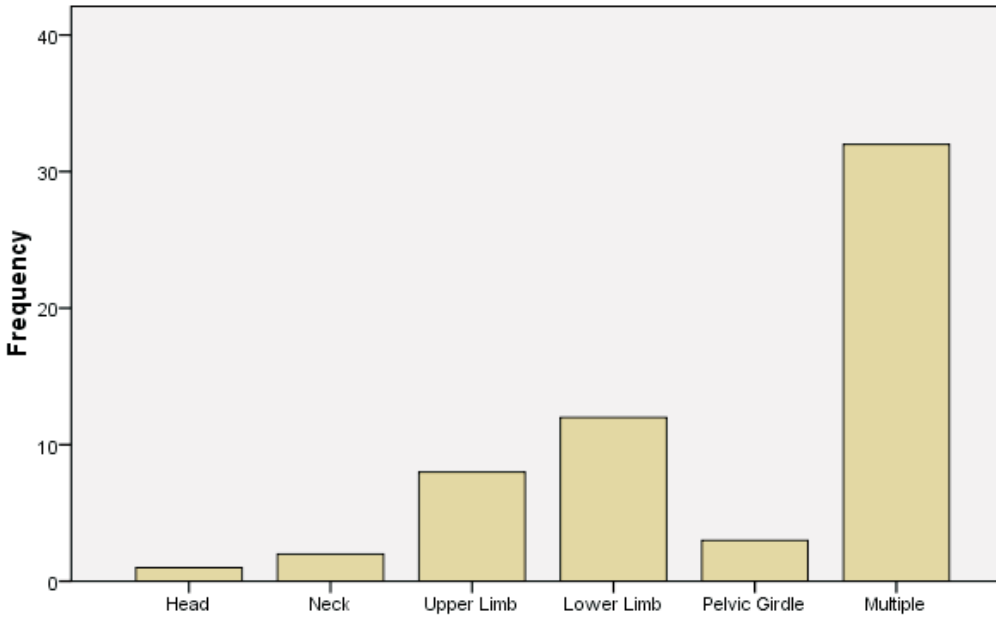

FIGURE 2: Anatomical Regions Injured

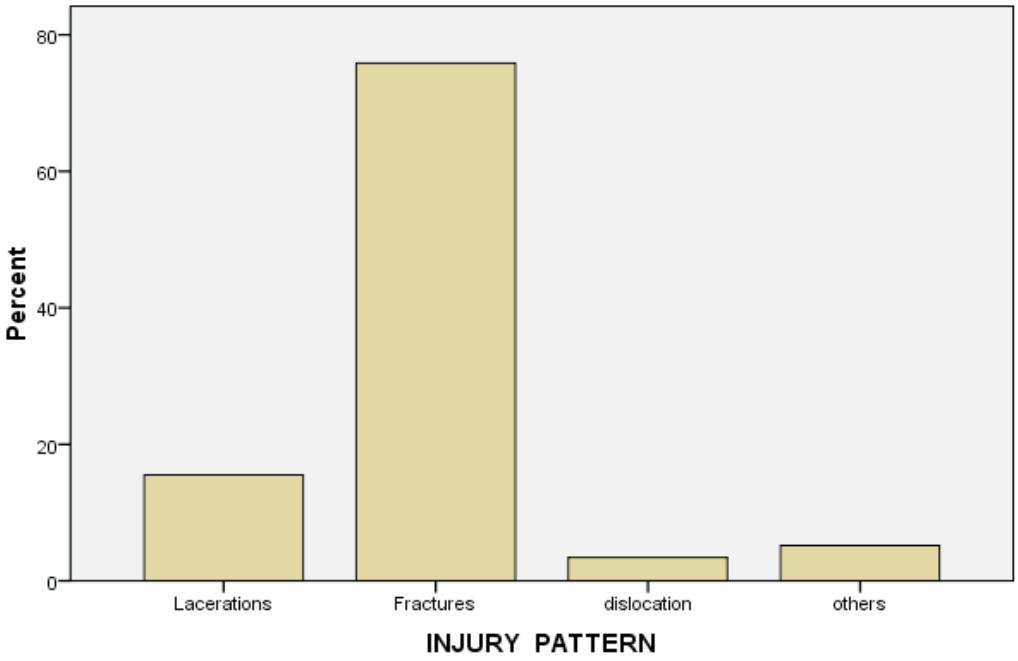

FIGURE 3: Pattern of Injuries

DISCUSSION

Our result shows that buses 24 (41.3%) were the commonest vehicles involved in accidents in our environment. This may not be unconnected with the fact that they are mostly used for intercity travels and are relatively cheaper than cars in terms of transport fare. Similar findings have been documented in an earlier study by Thanni et al in which mini buses were responsible for 63.9 % of the accidents in their series. The drivers of these vehicles are sometimes not well trained and engage in driving under the influence of alcohol and other stimulants.

Our study also found that Vehicle-Vehicle collision was the commonest mechanism of the accidents. Madubueze et al documented that 38.8% of RTA in their series was due to head–on collisions. They suggested that this may be due to the poor state of our roads causing drivers to swerve to avoid potholes. They also asserted that poor driving techniques coupled with impatience of drivers could be major causative factors.

The male to female ratio was 1.1:1. This does not show the glaring male predominance seen in other studies where 1.5:1, 2.2:1 and 2.5:1 were recorded[1,13,14]. This may be due to higher female involvement in both intercity and intra city travels and possibly fending for the family as well in the study area.

The mean age was in the third decade. The age group most involved in RTA as observed in this study is 21 to 30 years. This is the vibrant and productive age for the community. Most of them are bread winners' in their families and sudden incapacitation from road traffic injuries takes a toll on financial and social well-being of the family. Similar results have also been documented in earlier studies.[1,13] Fractures occurred in 75% of the patients. This is higher than 62.5%, 25.3% and 18.7% recorded by Thanni et al, Solagberu et al and Madubueze et al respectively[1,14,15]. This may be due to the fact that the teaching hospital is the main referral hospital within a radius of 70km that has the facilities to routinely treat fractures. Most of the referrals are usually from peripheral hospitals.

Some of the patients were discharged against medical advice (DAMA). Most of those that were DAMA had fractures. This is higher than 12.7% documented by Madubueze et al.[15] This shows that there is still patronage of traditional bone setters in our environment. Some patients come back for orthodox care after developing complications at the traditional bone setter's place. There is need to continue enlightenment of the populace on dangers of traditional bone setting in our environment.

More than half of the patients sustained multiple injuries. This is higher than what was obtained in other similar studies.[15.] Buses were mostly involved in the crashes in this study implying higher energy transfer to the patients. Furthermore, the other tertiary institutions in the state triage and refer the more severely injured patients to the teaching hospital Mortality rate of 3(5.4%) is within the internationally documented rate of 0.5 to 6%[15].

In conclusion vehicle-vehicle collision is the commonest cause of RTA in our environment. Buses have been observed to be mostly involved in these accidents and

multiple injury is the commonest pattern of presentation. There is need for prioritization of resources to cater for the rising number of multiply injured patients. Government agencies and non-governmental organizations who have the responsibility of enlightening the populace should intensify their efforts in order to reduce injuries sustained on our roads. ▬

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PATTERN OF MATERNAL AND PERINATAL COMPLICATIONS AT DELIVERY IN A TERTIARY HOSPITAL IN NORTH-WESTERN NIGERIA

Muhammad Z [1], Ugwa, EA[2], Onuorah C[3]

ABSTRACT

Background: Maternal and perinatal healths are very important public health issues. The availability and quality of health care delivery systems of any nation is its maternal and perinatal mortality statistics. **Objective:** To determine the pattern of maternal and perinatal morbidities among mothers who are booked for antenatal care in Aminu Kano Teaching Hospital and those who did not and to determine the factors which contribute to these outcomes. **Methods:** Women who did not have antenatal care (unbooked mothers) at Aminu Kano Teaching Hospital and those who had (booked mothers) between 1st July, 2006 and 31st June, 2009, were retrospectively studied for maternal complications and perinatal outcome. The indices of outcome measured in this study were Caesarean section rates, antepartum eclampsia, antepartum haemorrhage, postpartum haemorrhage, low birth weight, low Apgar scores, stillbirth, and foetal macrosomia. Both groups had their deliveries supervised at Aminu Kano Teaching Hospital. The data between the two groups were compared. **Results:** A total of 11,035 deliveries were conducted during the study period. Of these, 8,292(75%) were booked while 2,743(25%) of total deliveries were unbooked. Among the booked group, 6,363 files were retrieved giving a file retrieval rate of 76.7% while in the unbooked group, 1,998 case files were retrieved, giving a file retrieval rate of 72.8%. Compared with booked mothers, unbooked mothers had more maternal complications and poorer perinatal outcomes. Caesarean section rate is significantly commoner among the unbooked patient (25.52% against 6.47%, P=0.000), antepartum eclampsia occur commonly in the unbooked patients (5.94% against 0.87% P=0.000),antepartum haemorrhage also occur significantly in the unbooked patients (2.95% against 0.47%, P=0.000). Postpartum haemorrhage is commoner in the booked patients (2.73% against 1.07% P=0.000).Low birth weight is commoner among the babies of the unbooked patient (21.51% against 7.22%, P=0.000), low Apgar scores is higher among babies of the unbooked patient (17.17% against 4.29%, P=0.000).There was no statistical difference in the occurrence of stillbirth between booked and unbooked patients(15.13% against 2.56% P=0.133). **Conclusions:** There is a significantly higher maternal and perinatal complication in the unbooked women than the booked. There is also a positive correlation between unbooked mothers and an increased risk of maternal and foetal adverse outcomes and that parity, distance and maternal age affect these outcomes.

KEYWORDS: Booked/unbooked pregnancies, maternal complications, perinatal outcome.

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INTRODUCTION

Maternal and perinatal morbidity and mortality are very important public health issues. The availability and quality of health care delivery systems of any nation is its maternal and perinatal mortality statistics.[1]

Forty-two percent of the 129 million women who gave birth annually experience some complications during pregnancy.[2-3] Approximately 15% of women worldwide develop potentially

life-threatening complications, which include chronic pain, impaired mobility, damage to the reproductive system and infertility.[4]

In developing countries, pregnancy and complications from childbirth account for 18% of disease among females.[5-6]

Harrison, Ekwempu, Onwudiegwu Oguniyi and Faleyemu all agreed that Maternal complications and perinatal outcome are indirectly proportional to the utilization of antenatal and delivery care services.[7-11] Antenatal care is a specialized pattern of care organized for women to enable them attain and maintain a state of good health throughout pregnancy, and to improve their chances of having safe delivery of healthy infants at term.[11] One of the purposes of antenatal care is the prevention of maternal and foetal complications through appropriate and proactive measures.[9] There are studies which have highlighted the importance of antenatal care in ensuring better maternal and perinatal outcomes.[12] Ekwempu found that antenatal care was associated with a three-fold reduction in perinatal loss and virtual elimination of foetal loss from stillbirth.[8] This study is a comparative analysis of the pattern of maternal and foetal complications at delivery among booked and unbooked mothers over a 36-month period from 1st July, 2006 to 31st June, 2009 at Aminu Kano Teaching Hospital and to determine the factors responsible for these complications. The findings from this research may help policy makers and government in planning and budgeting towards interventions that are relevant for reduction of maternal and perinatal morbidity and mortality.

MATERIALS AND METHODS

Women who did not have antenatal care (unbooked mothers) at Aminu Kano Teaching Hospital and those who had (booked mothers) between 1st July, 2006 and 31st June, 2009, were retrospectively studied for maternal complications and perinatal outcome. Both groups had their deliveries supervised at Aminu Kano Teaching Hospital. The data between the two groups were compared. The unbooked mothers were those who did not have antenatal care at Aminu Kano Teaching Hospital or had one in a place considered by the unit as being of less than standard level of care, while booked mothers were defined as those who have had at least two antenatal care visits at our centre in Aminu Kano Teaching Hospital, Kano. The case files of the patients were retrieved from the medical records department of AKTH and the following data collated: age, parity, residential address, educational status and social class. The pattern of maternal complications and perinatal outcomes were also reviewed. The maternal complications were determined by Caesarean section rate, antepartum eclampsia, antepartum haemorrhage and postpartum haemorrhage. The perinatal outcomes were determined by low birth weight, low Apgar scores, stillbirth and foetal macrosomia.

Data Obtained was analyzed using SPSS (SPSS 14, Chicago, IL) statistical software. Absolute numbers and simple percentages were used to describe categorical variables. Similarly, quantitative variables were described using measures of central tendency (mean, median) and measures of dispersion (range, standard deviation) as appropriate. Statistical significance was determined using Chi-square test with the level of significance set at $P< 0.05$.

RESULTS

A total of 11,035 deliveries were conducted during the study period. Of these, 8,292 constituting about 75% were booked while 2,743, constituting about 25% of total deliveries were unbooked. Among the booked group,6363 files were retrieved giving a file retrieval rate of 76.7% while in the unbooked group,2057 case files were retrieved, giving a file retrieval rate of 72.8%.

Table I

Shows the socio-demographic characteristics of booked and unbooked mothers at delivery. Mean age for the booked mothers was 27.0 ±5 years,while the mean parity was 2.9 ± 2. For the unbooked, the mean age was 27.0 ± 6 years and the mean parity was 3.0 ± 2.4. In both groups most of the mothers were in the age range 20-39 years. However, there were more mothers < 20 years in the unbooked group compared to the booked group(9% and 2.7%, P=0.000). Proportion of women aged 40 years or more in the two groups showed statistically significant difference (4% Vs. 1.7% P=0.021). More of the unbooked group either had no formal education or only had primary education (79.9%) compared with the booked who had either a secondary or postsecondary qualifications (87.8%, P=0.000). More unbooked mothers were in the lower social class (72%); few were in the middle class (18.8) and even fewer were in the upper class (9.2%). This is in contrast to the booked mothers who were more in the middle and upper social classes (45.5% and 22.3% respectively) , while lesser percentage of them were in the lower class (32.3%).

In terms of parities, more of the booked mothers were in the 1-4 parity range, followed by 0 parity and lastly the ≥ 5 parity range. There is however higher percentage of primigravida and grandmultiparous women among the unbooked when compared with the booked (37% and 34.7% against 33.3% and 30.3%). Most of the booked women (80 %) leave within 20 km from the hospital, while most of the unbooked women (55%) leave >20 km from the hospital.

Table II

All determinants of maternal complications and perinatal outcomes, with the exception of postpartum haemorrhage, were higher in the unbooked group when compared with the booked group. This difference was statistically significant (p= 0.001). Postpartum haemorrhage was higher in the booked mothers compared with the unbooked ones. Figure I Shows the changing pattern of proportion of booked and unbooked mothers in AKTH during the study period taken at six monthly intervals. There was a higher percentage of unbooked mothers at delivery in the period, 1st July-31st December, 2006 (33%) than the period, 1st January-31st June, 2009(21%).

Table I: Sociodemographic characteristics of booked and unbooked mothers.

Variables	Booked (N= 6,363)	Unbooked (N = 1,998)
Age Group		
< 20	252(4)	180(9)
20–39	6003(94.3)	1768(88.3)
≥40	108(1.7)	50(2.7)
Educational level		
None & primary	776(12.2)	1596(79.9)
Secondary	3328(52.3)	302(15.1)
Post-secondary	2259(35.5)	100(5)
Social class		
Upper	1419(22.3)	184(9.2)
Middle	2889(45.4)	376(18.8)
Lower	2055(32.3)	1439(72.0)
Parity		
0	2118(33.3)	740(37)
1–4	2310(36.4)	566(28.3)
≥5	1924(30.3)	692(34.7)
Distance from hospital		
< 20km	5090(80)	899(45)

Table 2: Pattern of maternal complications and perinatal outcome among booked and unbooked mothers.

Variables	Booked. n= 6,363 (%)	Unbooked. n 1,998(%)	X2	P Value
Maternal complications				
Caesarean section	412(6.47)	510(25.52)	562.65	0.001
Antepartum eclampsia	55(0.87)	119(5.94)	49.32	0.001
Antepartum haemorrhage	30(0.47)	59(2.95)	88.91	0.001
Postpartum haemorrhage	174(2.73)	21(1.07)	18.92	0.001
Perinatal outcomes				
Low birth weight	459(7.22)	430(21.51)	327.19	0.001
Low Apgar scores	273(4.29)	343(17.17)	369.42	0.001
Stillbirth	239(3.76)	90(4.48)	2.25	0.133
Foetal macrosomia	163(2.56)	302(15.13)	456.20	0.001

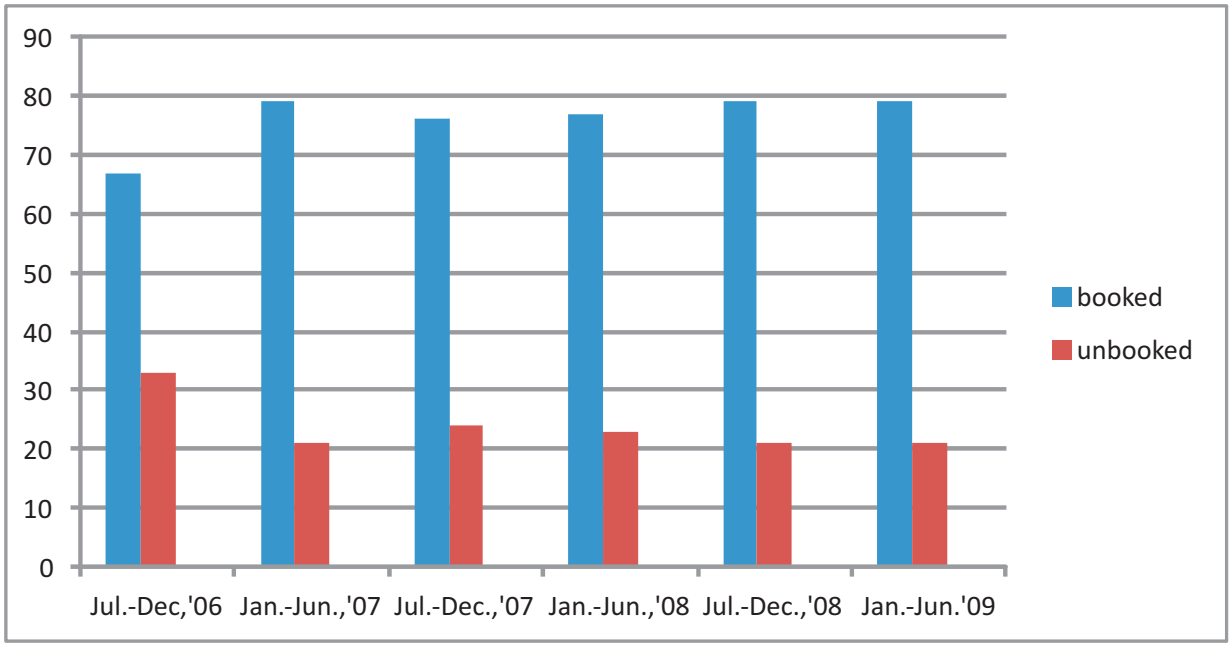

Figure1: Pattern of booked and unbooked mothers in AKTH, from 1st July, 2006 - 31stJune, 2009

DISCUSSION

Maternal mortality and morbidity remain an issue of serious research and concern in many parts of the world, especially the developing nation where the burden is more.

In our study, 75% of the patients were booked and 25% were unbooked. This proportion of unbooked mothers is similar to 29% reported from Ile-Ife by Owolabi, et al[9] but higher than 15% from South Africa by Basu.[10] The reason could be due to aversion to western oriented programmes in our environment probably due to poverty and illiteracy. It has been reported that 10-30% of deliveries in developing countries are unbooked.[10]

Analyses of socio-demographic characteristics showed that unbooked mothers were not significantly younger in age than booked mothers. Most unbooked mothers belong to a lower socio-economic class than their booked counterparts. The association between age and booking status agrees with the observation of de Jong, et al[11], but is in contrast to the observation by Owolabi and Adelusi.[9] As in this study also, Harrison has shown a correlation between education and maternal morbidity[8].

This study also agrees with findings by Harrison, Owolabi, et al and de Jong[8,9,11] who reported that a higher proportion of the grandmultiparous patients were unbooked. A higher proportion of grandmultiparous mothers were unbooked possibly because they have gained personal experience in labour and tend to ignore antenatal care. Also, most primigravidae were unbooked when compared with those who booked in this review. Harrison[7] and Owolabi, et al[9] reported that their observation of a

significantly higher proportion of unbooked grandmultiparous mothers in their study, was most likely because these mothers had previous successful deliveries and therefore felt overconfident and refused to seek antenatal care leading to attendant increase in perinatal and maternal mortalities and morbidities in this group of mothers.

review, Harrison[7] and Owolabi, et al[9] reported that their observation of a significantly higher proportion of unbooked grandmultiparous mothers in their study, was most likely because these mothers had previous successful deliveries and therefore felt overconfident and refused to seek antenatal care leading to attendant increase in perinatal and maternal mortalities and morbidities in this group of mothers.

The result also shows a positive correlation between unbooked mothers and increased risk of maternal and foetal adverse outcomes. This agrees with the reports of Harrison[8] and Owolabi, et al[13] In both the booked and unbooked mothers, complications are higher in those less than 20 years of age and above 40 years of age, reasons being that certain conditions such as eclampsia and intrauterine growth restrictions are commoner in these age groups.[12,13]

Adequate antenatal care and hospital deliveries enable obstetricians to diagnose complications at an early stage when intervention will bring about better results.[14]

Pregnancy outcomes in the unbooked mothers were significantly poorer than in the booked mothers, due to high low birth weight babies, and a very high incidence of Caesarean section rates.[13] Unbooked patients presented late with complications making surgical intervention inevitable because of foetal distress and prolonged obstructed labour with attendant high maternal and perinatal mortality.[13] The Caesarean section rate of 25.52% in the unbooked mothers was higher than 6.47% among the booked mothers. In our environment a Caesarean section rate of 10.2 – 34.7% has been reported in some Teaching Hospitals.[15-16] The higher rate have been shown by this study to be due to lack of utilization of antenatal and standard delivery facilities resulting in complicated labour necessitating operative abdominal deliveries. The higher incidence of antepartum complications such as antepartum eclampsia and antepartum haemorrhage among others like obstructed labour and anaemia as reported by Owolabi et al in Ile-Ife are factors that may lead to poor outcomes in the infant and the mother.[9] Some of the unbooked patients were admitted in labour in substandard facilities within and outside Kano metropolis only to be referred or abandoned to self-referral to our unit with prolonged labour and onset of complications.

There has however been a gradual decline in the number of unbooked patient from 33% to 21% in the period under review. The reason for this decline in unbooked patients was probably due to public enlightenment where obstetricians on radio and television programmes, educate women on the importance of antenatal care and the free antenatal services offered by the government in State hospitals. This is in contrast to reports in other parts of Nigeria which showed a trend of decline in

antenatal attendance and hospital delivery rates because of rising hospital bills. [17,18] Some other studies in our environment elucidated other factors such as aversion for Caesarean sections, religious beliefs, illiteracy, poverty ,and environmental and cultural prejudices, as barriers hindering women from utilizing prenatal care and hospital delivery. [9,19]

In conclusion unbooked mothers are at increased risks of maternal complications and adverse foetal outcome. Public enlightenment on the importance of antenatal care and hospital delivery could improve the outcome of pregnancy. Training of health workers at the primary and secondary levels of care on identification of high risk patients and prompt referral when the need arises is key in reducing perinatal and maternal morbidities. Free antenatal and delivery services as rendered in some places would increase the number of booked patients and help reduce complication. ■

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ORIGINAL ARTICLE

BILATERAL TUBAL LIGATION AT AMINU KANO TEACHING HOSPITAL: A FIVE YEAR REVIEW

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ABSTRACT

Background: Tubal ligation may be good for women seeking out a safe, effective, permanent and convenient form of contraceptive. However, due to variety of reasons, there is aversion to it especially in developing world. **Objective:** To determine the incidence, socio-demographic characteristics of acceptors, indications and complications of tubal ligation (BTL) at Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria. **Methods:** A retrospective study of BTL at AKTH, was conducted over a five year period, between 1st January, 2008 to 31 December, 2012. The records of women who had BTL/ used other contraceptive methods were retrieved from the medical Records Department and family Planning Clinic. **Results:** Period prevalence of BTL was 2.6% among contraceptive acceptors. The mean age and parity were 35.0±5.0 and 6.0±2.0 respectively. Majority of those that had BTL, had only Quaranic education 23(34.3%). Majority of cases (82.1%) were done during caesarean section / laparotomy. Postpartum BTL accounted for 11.9%, while interval BTL accounted for 6%. BTL in patients with ruptured uterus (31.3%) was the commonest indication. One of the acceptor came back with regrets. Only 4.5% had complications, which were not primarily due to the procedure. **Conclusions**: BTL is a safe and effective method of sterilization. Utilization of BTL especially postpartum and interval BTL is still low in our community.

KEYWORDS: Bilateral Tubal Ligation, period prevalence, regret

INTRODUCTION

Tubal sterilization results in mechanical block or interruption of fallopian tubes to prevent sperm from fertilizing egg[1,2]. Tubal sterilization is indicated for women who want a permanent method of contraception and are free of any gynecologic pathology that would otherwise dictate an alternative procedure [3-5]. Tubal sterilization may also be indicated for women in whom a pregnancy could represent a significant social and medical risk [3-5].

In 1960s, many centers used the American College of Obstetrics and Gyneacology formular in which age multiplied by parity had to be greater than or equal to 120 before elective sterilization could be considered. But in 1970s, the protocol was liberalized partly by population control policies [4].

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More than 190 million couples worldwide use surgical sterilization as a safe and reliable method of permanent contraception [2]. Presently in Britain, almost 50% of couples aged 35-44 are using either male or female sterilization as their method of contraception [4]. While in the United State of America (USA) up to 11% of women aged 15-45 years rely on tubal sterilization for contraception[2]. In Nigeria only 0.1% of women aged 14-44 years use female sterilization as a contraceptive method [6].

In Africa, the acceptance rate is low because of deep rooted socio-cultural and religious barriers, poverty, inadequate counseling, limited facilities and trained personnel [1, 6, 7]. These are evidenced by the fact that about 30% and 90% of women in Africa do not have medical care during pregnancy and delivery respectively [8]. Some Muslim countries like Egypt and Indonesia do not permit BTL [5], and faith based institutions will sometimes refuse to permit it [7]. Tantawi[9] a respected Islamic scholar from Cairo in Egypt, explained that Islam permits the use of contraception including BTL, provided that there are strong reasons for it, based on personal circumstances of the couples, and provided that they are used for a good cause and result in no harm. Efforts are being made to correct the misconception that Islam opposes conception in many communities with varying degrees of success [8, 10, 11]. Hussanein [10] found that the use of modern contraceptives has increased in many Muslim populations, but the fertility rate among Muslim women is still higher, while the contraception prevalence is still lower than that of non Muslim women within the same country.

No study has been carried out on the utilization of BTL at Aminu Kano Teaching Hospital, in Kano, Nigeria which is predominantly an Islamic community. It is against this background that this study was designed to study the period prevalence, socio-demographic characteristics of the women, indication and complications of the procedure at Aminu Kano Teaching Hospital, Kano , Nigeria and to make recommendations which will improve its utilization.

MATERIALS AND METHODS

This is a retrospective study of BTL at Aminu Kano Teaching Hospital, Kano, Nigeria, between 1st January 2008 and 31st December 2012.

Aminu Kano Teaching Hospital is a tertiary health care delivery centre that is located in Kano City, in predominantly Islamic community. Kano State is the most populous state in Nigeria, with a population of about ten million people [12], consisting mainly of Hausa/ Fulanis, with a land area of 20,760 square Kilometers and the centre of commerce in Northern Nigeria. The health facility receive patients' from hospitals in the state, and neighbouring Jigawa and Katsina states.

The case records of women who had BTL were retrieved from the Medical Records

Department and analysed for age, parity, educational status, indication and complications. The record of those who had other forms of family planning methods were also obtained from the family planning clinic.

The data obtained were recorded in tabular forms. Quantitative data were recorded as frequencies and percentages. Quantitative data were summarized as mean and standard deviation.

RESULTS

In this study, out of the 2,783 acceptors of family planning methods, 73 clients had bilateral tubal ligation for various indications, giving a period prevalence of 2.6% of all acceptors of family planning methods. Among them 67 case notes were retrieved from the Medical Record department, giving a retrieval rate of 92%. All the clients were married. None of the clients who had tertiary education had emergency BTL. The socio-demographic characteristics is detailed in Table 1.The age range of the women was from 25 to 41 years, with the modal frequency (41.8%) occurring among 35-39 years age group. The mean age was 35.0±5.0 years.

The parity range of the women was from 2 to 10, with the modal parity (58.2%) occurring among para 5-7. The mean parity was 6.0±2.0. The highest frequency of BTL occurred among women with Qur'anic education only (34.3%) followed by primary school (28.4%), secondary school (25.4%), and tertiary education (11.9%).

Out of the 67 clients that had bilateral tubal ligation, majority of them 55 (82.1%) had it done during caesarean section /laparotomy for ruptured uterus, while 8 women (11.9%) had postpartum BTL, and 4 (6.0%) had interval BTL. Emergency BTL accounted for 34 cases (50.7%), while 33 (49.3%) were done electively. The indications for elective BTL were two or more previous caesarean section in 14 cases (16.4%), and medical disorders in 8 cases (11.9%). The 8 clients who had medical disorders and elective BTL had postpartum BTL. Among the cases with completed family size, 7 were done during caesarean section, while 4 had interval BTL. Ruptured uterus accounted for the highest frequency of 21(31.3%) clients, followed by two or more caesarean sections and medical disorders in pregnancy, both of which accounted for 14(20.9%) clients each, completed family size 11(16.4%) clients, and obstructed labour 7 (10.5%) clients. The medical disorders were diabetes mellitus in 3(4.5%) clients, psychiatric illness in 1 (1.5%) client, and hypertensive disease in pregnancy in 7(10.5%) clients, cardiac disease in 1(1.5%) client , and sickle cell disease in 2 (3.0%) clients . Table 2.

Most of the complications were not specific to BTL. Infection (50%) and haemorrhage (25%) were complications of ruptured uterus and obstructed labour. One client (25%) came back with regrets, because she remarried. There was no maternal mortality.

TABLE 1: Socio-demographic Characteristics of Clients Who Had BTL (N=67)

AGE (YEARS)	FREQUENCY (%)
25-29	10 (14.9)
30-34	16 (23.9)
35-39	28 (41.8)
40-44	13 (19.4)
PARITY	
2-4	12(17.9)
≥5	55(82.1)
LEVEL OF EDUCATON	
QU'ANIC ONLY	23 (34.3)
PRIMARY	19 (28.4)
SECONDARY	17 (25.4)
TERTIARY	8 (11.9)

TABLE 2: Indications For BTL

INDICATION	FREQUENCY n (%)
RUPTURED UTERUS	21 (31.3)
TWO OR MORE PREVIOUS CAESAREAN SECTION	14 (20.9)
MEDICAL DISORDERS IN PREGNANCY	14 (20.9)
COMPLETE FAMILY SIZE	11 (16.4)
OBSTRUCTED LABOUR	7 (10.5)

DISCUSSION

The 2.6% rate of bilateral tubal ligation among acceptors of family planning methods in this study is similar to 2.4% from Zaria.[13], which is also a predominantly Islamic community from north western Nigeria. It is however lower than 4% from Ile-Ife [14] and 8% from Enugu [15,] Both predominantly Christian communities in southern Nigeria.This agrees with Hassanein [10] that contraceptive prevalence is still lower among Muslim women even within the same country, which calls for more efforts at correcting misconception about its acceptance and safety, in order to improve its utilization in our community where appropriate. However in developed countries BTL is used by 33% of women using contraception[3]. The low acceptance and utilization of BTL in Nigeria compared to the developed countries is possibly explained by poor utilization of maternity services, higher frequency of unstable marital relationships and remarriages, the fear of surgery, and myths that they may reincarnate with blocked tubes and infertility[1].

The higher acceptance and utilization of BTL in developed countries besides having more stable marital relationships and absence of fear or myths that are associated with it in developing countries, is the changing cultural climate in the developed counties which encourages women to reduce their family size[16]. Surgical advances have resulted in safe, less invasive female sterilization procedures when child bearing is no longer desired[17]. Most importantly, insurance companies began to cover female sterilization procedure, making the procedure accessible to millions of women in the United States of America who previously were unable to afford the surgery[2].

The mean age and parity of 35.0±5.0 years, and 6.0±2.0 in this study is similar to 34.3 years 5.5 from Makurdi, [18] in north central Nigeria. This may be because clients who are less than 30 years of age at the time of the procedure and /or of low parity are relative contraindications to using BTL for contraception because regrets are common [18]. Follow- up interviews 14 years post procedure in India, [19] demonstrated that regrets were expressed by 20.3% of women aged 30 years or younger at the time of BTL and by 5.9% of women older than 30 years at time of procedure.This may explain the mean age of 35 years and high parity of the women who accepted BTL, which agrees with other studies [18,19].

Ruptured uterus with grandmultiparity was the commonest indication for BTL, which may explain why majority of the cases were done as emergencies. Most of the clients for BTL were grandmultiparae, unbooked and low literacy level, which are risk factors that are interwoven and together constitute the triad of maternal calamities, like ruptured uterus in developing countries [20.] This agrees with studies from developing countries [14, 15, 18], and may explain why majority of women that had BTL in this study, are of low literacy level.

The second commonest indication for BTL in this study were two or more previous caesarean section and medical disorders of pregnancy, probably because additional pregnancies would be hazardous to the

mother, and consent for the procedure might have been easier to obtain [19]. This agrees with the findings from Makurdi [17] and India [19]. This, together with the high frequency of ruptured uterus may explain why majority of BTL were done during caesarean section, which was also the experience of Swende et al [18] in Makurdi.

Complications of BTL are usually not primarily due to the procedure, but are usually that of anaesthesia or other procedures that were done in addition [18], which was also the finding in this study. One patient (25%) came with regrets and wanted a reversal because she had just remarried, which was also the experience in other studies [19]. In the USA as many as 6% of women who are sterilized report regret or request information about tubal reversal within 5 years of the procedure [2]. Regrets are common when BTL is carried out on women who were not adequately counseled, less than 30 years of age at the time of the procedure, of low parity and had no male child, single parent status or being in an unstable relation, and lack of partner motivation or involvement prior to sterilization [19]. In the case illustrated in this study, the patient was more than 30 years old and a grand multipara. Involvement of the husband in decision making is mandatory in our hospital, and informed consent must be signed by him before the procedure is carried out. Unstable relationship was the risk factor as she had just remarried.Unstable relationships, high rate of divorce and remarriages are common risk factors for refusal to give consent for sterilization, and it is an issue which should be tackled in our community if appreciable increase in BTL acceptance and utilization is to be achieved. Involvement of marriage counselors, community and religious leaders in pre-marital and post-marital counseling, and increase in literacy level in our society as well as female employment may go a long way to achieve stable marital relationships. Also overcoming fear and myths that are associated with the procedure, [13, 19] and reliable form of contraception, especially among women who have completed their family.

Oye-Adeniran et al [21] found that more educated women tended to use contraceptives more with higher continuation rate, which may explain why all the clients who had interval BTL had tertiary education. Inculcating family planning into our educational curriculum in western oriented as well as Qur'anic schools at appropriate level will go a long way in creating awareness of BTL. Outreach efforts by the community health workers targeting men is likely to be effective in encouraging the men to support their wives in giving consent to BTL because their consent is necessary in this environment before their wives can have BTL. However, because of the biases which are inevitable in this hospital-based study and the small sample size, larger multicentre studies will be required to confirm these findings.

In conclusion, BTL is a safe and effective method of sterilization. Utilization of BTL is still low in our community. Efforts at enlightening our women on BTL as a safe permanent method of contraception should be encouraged so that more women, especially those who have completed their family size can utilize BTL for contraception.

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ORIGINAL ARTICLE

A SURVEY OF GENERAL MEDICAL PRACTITIONERS` KNOWLEDGE OF MANAGEMENT OF CERUMEN AURIS IN NORTH-EASTERN NIGERIA

NGAMDU YB, KODIYA AM, SANDABE MB, GARANDAWA HI, ISA A

ABSTRACT

Background: Cerumen auris (Ear wax) is the among common ear disorders seen by the General Practitioners (GPs). Cerumen auris removal is an otorhinolaryngological procedure most commonly performed by the GPs and it is their commonest source of iatrogenic otologic problems. This survey was conducted among GPs to seek their knowledge of managing cerumen auris and its outcome in North-Eastern Nigeria. **Methods:** This is a descriptive cross sectional study on the management of cerumen auris among GPs practicing in North- Eastern Nigeria. Closed ended structured questionnaires were administered to GPs during continuous medical education sessions carried out in four states (Adamawa, Borno, Gombe and Yobe)s of the North Eastern Nigeria from June to December, 2011. Data collected were analysed using SPSS computer software version 16.0. **Results:** a total of 130 questionnaires were administered to the GPS, 91% were completed and retrieve. Eight-five per cent of the respondents were males and 15% were females. About 14% of the GPs had no otoscope nor were it provided by their hospital. Sixty-nine of the GPs see less than 11 patients with cerumen auris per month, 1.7% see between 31 and 40 patients per month and none see greater than 40 patients per month. About 13% of the GPs diagnosed cerumen auris with history alone. About 55% of the GPs use wax softeners and ear syringing together as form treating cerumen auris. Ear pain is the commonest complication encountered by the patients after ear syringe. **Conclusions:** Application of wax softeners followed by ear syringing is the mode of treatment adopted by most practitioners, although they don`t follow the standard method. There is a need for continuous medical education on the management of cerumen auris among GPS.

KEYWORDS: Ear wax, Knowledge, General Practice

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INTRODUCTION

Cerumen auris (ear wax) is a mixture of secretions from two different gland types (ceruminous and pilosebaceous[2] together with squamous of epithelium, dust and other foreign debris. Cerumen auris is among the common ear conditions seen by General Practitioners (GPs). Cerumen auris removal is an otorhinolaryngological procedure most commonly performed by GPs and is their commonest source of iatrogenic otorhinolaryngological problems.[1] An average of 150,000 cerumen removal performed per week in the United

States.[2] There are no documented evidenced of rate of cerumen auris removal in the North-Eastern Nigeria. Although in south-western Nigeria cerumen account for 99% of ear syringing performed over a 16 months period.[3]

Cerumen auris may cause itchiness, tinnitus, otalgia or sudden hearing loss; however some patients present without otologic symptoms and only otologic examination would reveal cerumen[4] and its removal may be required in order to carry out adequate otoscopic examination. The Cerumen may obscure the tympanic membrane and hence the diagnosis occlusive or impacted wax, [1,5-7] causing or contributing to hearing impairment. Some suggest that Cerumen is an infrequent cause of hearing impairment[8] and only occurs with complete occlusion, where as others state the sensation of deafness may be marked and sudden.[9]

There are potential complications of ear syringing for removal of wax, this include tympanic membrane perforation, otitis externa, trauma to external auditory canal, vitergo, cardiac arrest.[1] We have seen several patients from primary and secondary public hospitals and, private hospitals who had complications of ear syringing. This warranted the evaluation of management of Cerumen auris by general practitioners (GPs).

MATERIALS AND METHODS

This is a descriptive cross sectional study on the management of cerumen auris among GPs practicing in North- Eastern Nigeria. Closed ended structured questionnaires were administered to GPs during continuous medical education sessions carried out in various states of the North –Eastern Nigeria from June to December, 2011. The questionnaires were administered at the beginning of each session and retrieved by the end of the session. A total of 130 questionnaires were administered during 5 different sessions in 4 (Adamawa, Borno, Gombe and Yobe) of the 6 states of the North East. Data on age, gender place of work, duration of practice, number of patient(s) with ear wax seen per month, method of treatment of ear wax and complication of ear syringe were collected and analysed using statistical package for social science (SPSS) version 16.

RESULTS

Of the 130 questionnaires administered, 119 (91%) were completed and retrieved (Table I). About 85% (101) of respondents were males and 15% (18) were females. About 61% of the practitioners have otoscope provided by the hospital while 25% had personal otoscopes and 14% have no otoscope at all. Table II shows distribution of number of patients seen with cerumen auris.

Approximately 69% of the practitioners see less than 11 patients per month. About 55% of practitioners offer wax softener followed by ear syringing as depicted in Table III. Clinical methods of diagnosis of cerumen auris by Gps is showed in Figure 1. Fifty one percent (51%) of respondents diagnosed cerumen auris using other forms of light source without use of otoscope.

The commonest complaint after ear syringing was ear pain as showed in figure 2.

Table I: Distribution of respondents by State of residence

State	Frequency/percent (%)
Adawama	24 (20.2)
Bauchi	13 (10.9)
Borno	41 (34.5)
Gombe	13 (10.9)
Taraba	11 (9.2)
Yobe	14 (11.8)
Others	3 (2.5)
Total	**119 (100)**

Table II: distribution of patients with cerumen auris seen/ month

Patients	Frequency/percent (%)
<11	82 (68.9)
11-20	27 (22.7)
21-30	8 (6.7)
31-40	2 (1.7)
Total	**119 (100)**

Table III: Treatment modalities offered

Method	Frequency/percent (%)
Manual removal	12 (10.1)
Wax softener alone	11 (9.2)
Wax softener with ear syringing	66 (55.5)
Referral to ENT specialist	30 (25.2)
Total	**119 (100)**

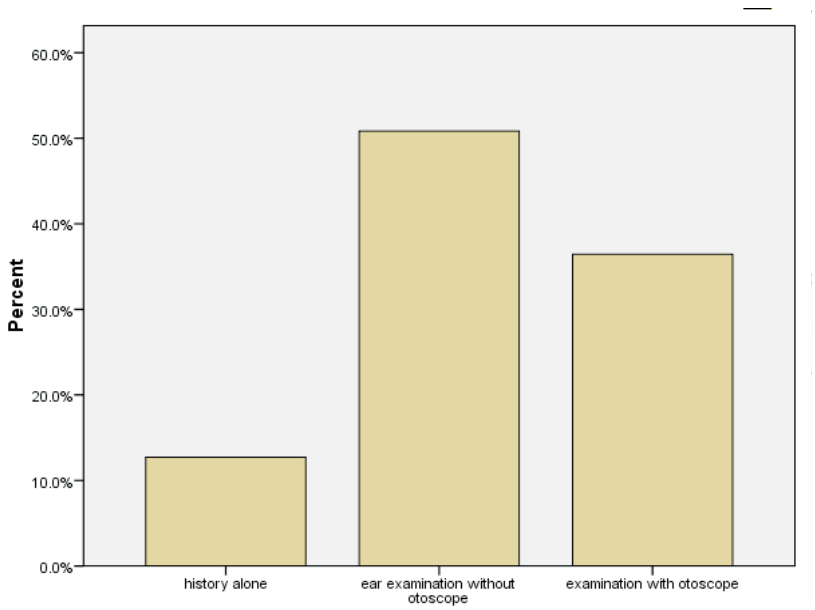

Figure I : Clinical methods of diagnosis of cerumen auris by GPs

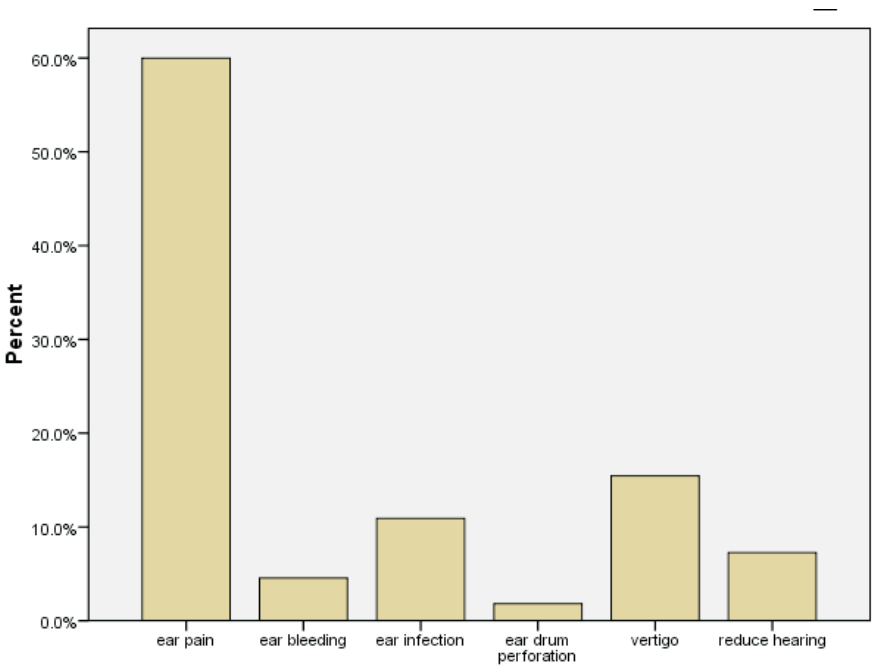

Figure 2: Complications after ear syringing.

DISCUSSION

The desire of individual patient to be, as it were, Cerumen free should not be under-estimated. Many patients believed that Cerumen is a pathological secretion and, that its mere presence is reason for its removal. There is little doubt that this attitude contributes greatly to the amount of ear syringing for cerumen auris that were have observed.

The high response rate (91.0%) suggests a high level of interest by the GPs in this common condition, for which there were few guidelines. The removal of impacted Cerumen may be necessary if it prevents a thorough examination of the tympanic membrane. The results show an average of 10 patients/month/doctor with Cerumen auris seen by GPs, though is only an estimate made by the participating GPs, the average figure confirms Sharp`s[10] finding that GPs syringe about nine patients a month.

Many people have ear wax, present without it causing symptoms. It can be removed to relieve many different symptoms, including tinnitus, earache, and vertigo, a feeling of fullness, irritation, and hearing aid problems, as well as deafness.[11] In this study, complains by the patients to GPs were sudden hearing loss, ear infection, tinnitus, itchiness and otalgia.

The examination of the external auditory canal is the first essential for the diagnosis of Cerumen auris. The results show 85.7% of GPs owned otoscope or available in their unit/ hospitals while the remaining 14.3% do not have otoscope. 53.85 carry out gross examination of the ear with help of illumination, 30.3% use otoscope and the rest do not examine the ears, and make diagnosis of Cerumen auris on history alone.

Cerumen auris can be removed from the ear by ceruminolytics, ear syringing, suction or hooking it out under direct vision[1]. Various softening agents and ceruminolytics (including oils and aqueous preparations) have been promoted as an adjunct or alternative to syringing.[8,12-17] These have two main actions, (i) to soften Cerumen prior to syringing or (ii) to disintegrate the Cerumen thus avoiding syringing.[18] The results show 54.6% GPs treat Cerumen auris with ear syringing with or without use of wax softener, 10.1% treat manually with instruments and 25.2% refer to ENT specialist. Oil was the ceruminolytics agent often prescribed and cerumol was the proprietary solution used most often.[10] Cerumol has been shown to be significantly more effective than bicarbonate solution and marginally better than olive oil or waxol in aiding Cerumen removal.[16] In the study 40.3% of GPs uses olive oil as Cerumen softening agent, while 30.3% uses cerumol. Although 21.0% of the GPs do not prescribe ceruminolytic agent, they either syringe without soften the Cerumen or remove manually.

The removal of Cerumen has been practised since the ancient Egyptians syringed suppurating ears with olive oil, Frankincere and salt.[19] Other historical remedies include the injection of goat urine, gall and instillation of steam.[20]

Most GPs syringe Cerumen auris with a traditional ear syringe, which can develop pressure of up to 16kpa (110psi). A few use other methods, including dental irrigation

systems such as the water pik.[21] In this study 55.9% uses conventional ear syringe, 33.6% uses intravenous canular size 14 or 16G with 20mls or 50mls syringe. None of the GPs in the study uses electric powered irrigation system. 33.5% of GPs perform ear syringing for the removal of Cerumen auris while 54.6% delegate practice nurse. Only 42.9% of the GPs re-examined the ears that were syringed.

The range of complication encountered after the procedure is well recognised by ENT specialist[1] but some GPs were unaware of any potential hazards. The referral rates of patients with complication after ear syringing suggest a rare of major complications of 1/1000 ear syringed.[19] Although the incidence of complication after syringe in out department is not kwon, patient refers to the department mostly with otitis externa, otalgia and vertigo. The study shows complications encountered by GPs after ear syringe: ear pain 55.5%, vertigo 14.3%.

CONCLUSION

Cerumen auris is an otologic disorder commonly seen by GPs. The removal of cerumen auris is essential, as sooner or later a hearing loss, tinnitus, intense itching, skin reaction or otitis external will occur. Application of wax softeners followed by ear syringing is the mode of treatment adopted by most GPs in our environment. Fortunately the procedure is usually simple but there are difficult cases which demand technical skill. Though most GPs don't follow the basic guiding principle of ear syringing and nursing staff were not thought the standard way of carrying out ear syringing ended off with unintended complications. There is a need for continuous medical education on the management of cerumen auris among GPS. Also putting nursing staff in the right way of ear doing syringing so that, to avoid most of the complication which were avoidable. ■

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CASE REPORT

SPONTANEOUS ENTEROCUTANEOUS FISTULA COMPLICATING ENCACERATED FEMORAL HERNIA: A CASE REPORT

ALIYU S, IBRAHIM AG, LAWAN AM, ALI N, SALIM MU

SUMMARY

Femoral hernias are uncommon of all external abdominal hernias; however they are the most commonly incarcerated external hernias, leading to significant morbidity and mortality. Rarely, such strangulation of viscus may result in spontaneous fistulation with its sequellae of fluids and electrolytes imbalance, anaemia, and malnutrition. We report a case of spontaneous enterocutaneous fistula resulting from neglected strangulated femoral hernia.

KEYWORDS: Femoral hernia, Strangulation,Spontaneous, Enterocutaneous Fistula.

INTRODUCTION

Femoral hernia is an uncommon external hernia with high possibility of strangulation due to the narrow neck of the hernia ring[1]. However, spontaneous enterocutaneous fistula arising from its strangulation is rare except in neglected cases[2]. Most of the cases of spontaneous fecal fistulae reported in the literature are from developing countries like Pakistan, India, Nigeria and Yemen[3-6] Enterocutaneous fistula is associated with profound fluids and electrolytes derangements. Such patients are usually malnourished, dehydrated, anaemic, and may be septic with or without peritonitis[7]. The management require resuscitation by correction of fluids and electrolytes imbalance, blood transfusion, nutritional support, antibiotics and definitive procedure of bowel resection, anastomosis and femoral herniorrhaphy.

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CASE SUMMARY

The patient was a 60- year old woman from rural area in neigbouring Yobe state who presented with painless right groin swelling of 10 – years duration. The swelling was reducible but became irreducible in the last three weeks associated with pain, vomiting, constipation, and abdominal distension. Five days prior to presentation she noticed foul – smelling feculent discharge from the right groin swelling via multiple openings. There was no preceding trauma, and there was no history of incision of the swelling by traditional healer and patient was never taken to any hospital. She is not diabetic nor hypertensive. Other systems were essentially normal. She was found to be chronically ill – looking, wasted, pale, dehydrated, febrile and weak. Her pulse rate was 110/min and blood pressure was 80/60mmHg. The essential findings on abdominal examination were multiple openings discharging faces over an indurated femoral swelling (Fig 1).

A working diagnosis of spontaneous enterocutaneous fistula from strangulated femoral hernia was made. The investigations done were PCV 21%, Blood chemistry Na 120mmol/l, K 2.8mmol/l, Urea 7mmol/l, Cr 149mmol/l, total protein 51g/l, albumin 28g/l. Other investigations were within normal limits. Patient was resuscitated with intravenous fluids, electrolytes corrected, had 3 units of blood transfused, antibiotics (ceftriaxone and metrponidazole), and nutritional support were given. Intraoperative findings were incarcerated small bowel with multiple lateral fistulae involving hemi circumference with the largest having a diameter of 2.6cm (gangrenous portions have sloughed off- Fig.2). Patient had bowel resection, anastomosis with femoral herniorrhaphy under general anesthesia (Fig 2 and Fig 3). The post operative recovery was uneventful; she was discharged three weeks after surgery.

Fig 1: Multiple openings discharging faces over an indurated femoral swelling.

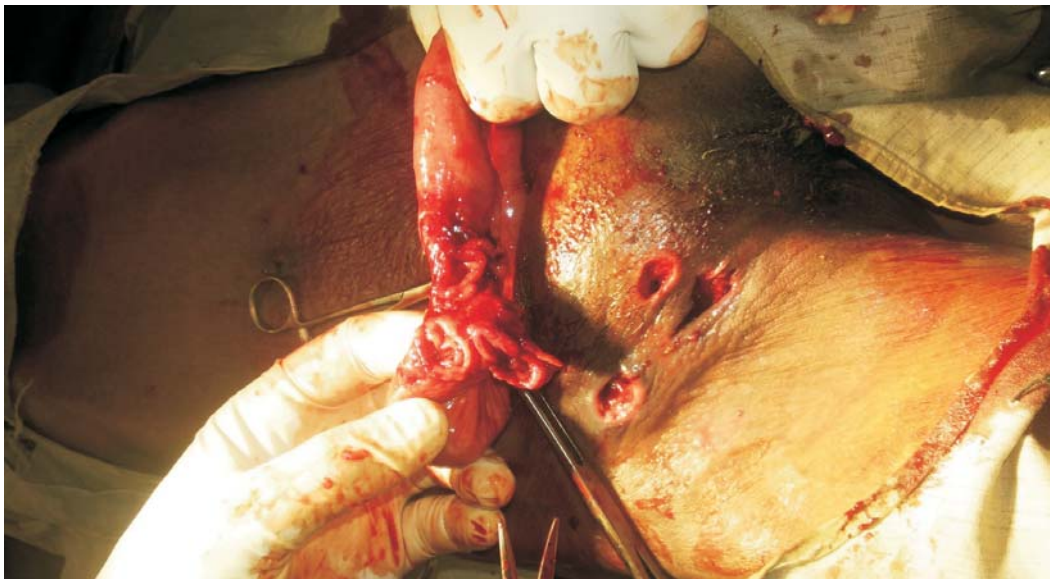

Fig 2: Multiple fistulae

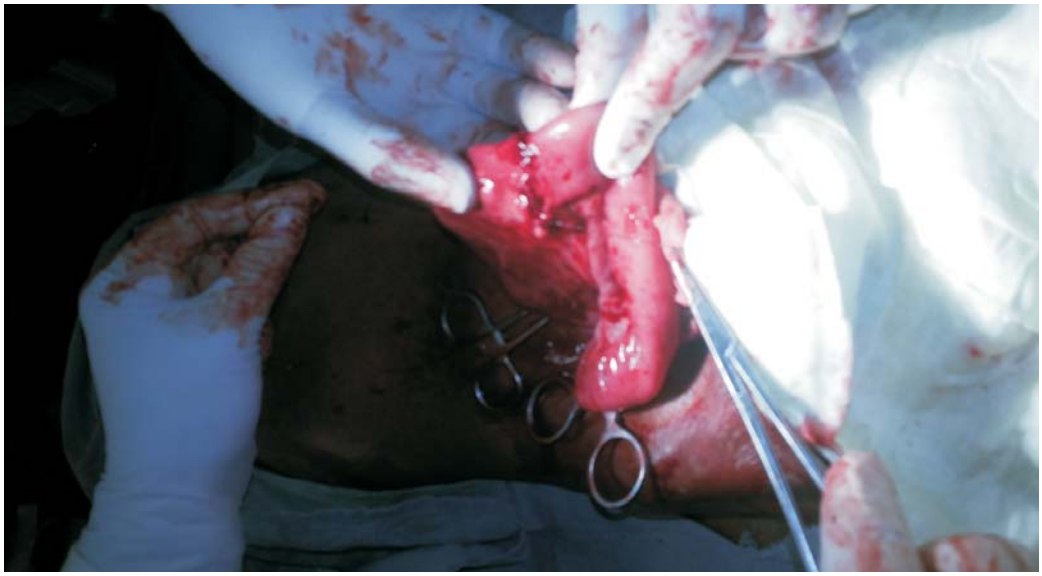

Fig 3: Resection and end to end anostomosis.

DISCUSSION

Spontaneous enterocutaneous fistula is a rare entity as more often strangulated hernias are surgical emergencies with short history. Strangulation and fistulation, a process that require time can occur only in neglected cases or where medical services are not readily accessible[8] as in the index patient. Enterocutaneous fistula is associated with high morbidity and mortality. The triad of sepsis, malnutrition, and fluids / electrolytes disturbance is the greatest determinant of mortality [8]. In the index patient, such challenges were encountered. The initial management of these patients is aimed at correction of fluids and electrolyte disturbances, control of sepsis and

nutritional support to combat hyper catabolic state and prevent malnutrition. The management of the index patient relied on this principle. In favorable circumstances, 60 – 70 % of fistulae will healed spontaneously within 6 weeks of conservative management [9]. In the index patient surgery was undertaken after initial management because there was no facility for total parenteral nutrition. Nutritional rehabilitation was intensified and recovery was remarkable. All hernias should be promptly evaluated and repaired to prevent incarceration and its sequellae. ■

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CASE REPORT

GIANT LIPOMA – BREAST AS A RARE SITE OF OCCURRENCE

MUSTAPHA Z[1], TAHIR N[2], AMEADAJI M[1], MINOZA K[3], PINDIGA UH[4], OKEDAYO M[1]

SUMMARY

Lipomas are the most frequent mesenchymal soft tissue tumors, but breast lipomas are usually small, asymptomatic and incidental findings on mammograms. This benign neoplasm can be treated by simple excision. We report a rare case of a Giant breast lipoma in a 30 year old woman, histologically confirmed by ultrasound guided core tissue breast biopsy.

KEYWORDS: Breast, giant, lipoma, mammogram

INTRODUCTION

A lipoma is a neoplasm of adipose tissue, composed of mature lipocytes[1]. Breast lipomas contain fat only, with no fibroglandular elements and are invariably benign, encapsulated, small and quite common, affecting women of all ages. The giant variety is however very rare[2,3].

Breast lipomas are usually small, asymptomatic and incidental findings. Giant lipomas may present with a painless increasing growth of one breast[3]; which on examination may appear asymmetric from the normal side[4]. They are usually soft and their gross position should correspond to the mass seen on a mammogram[2,5]. Imaging of small breast lipomas can be difficult and is best done by placing a metallic breast marker over the palpable mass, and despite this, many can be mammographically occult[6]. A breast lipoma is described as giant if it measures greater than 10cm in any one of its diameters or weighs a minimum of 1000grams[7-9]. Giant breast lipomas may also prove difficult to image especially when within a predominantly fatty breast. When seen on a mammogram, no additional imaging is required[6].

This report presents a rare case of a giant lipoma of the breast, which to the best of our knowledge is the first reported in our locality of Maiduguri, northeastern Nigeria.

CASE SUMMARY

F.A is a 30 year-old multi-parous woman who was referred to the mammography unit of Radiology department, University of Maiduguri Teaching hospital (UMTH) from a peripheral hospital with a year's history of left breast swelling which had recently increased in size. The mass was

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painless, however the patient complained of increased heaviness of that breast. There was no family history of breast cancer.

On examination, the patient was a young healthy looking lady, not in any form of distress, but the left breast was slightly larger than the right. Though a mass was barely palpable, a baseline screening mammogram using a GE DMR-Senograph mammography machine and cranio-caudal (CC)and medio-lateral oblique (MLO) views of both breast were obtained(figures 1 & 2) and showed scattered fibroglandular densities (with 25% - 50% glandular tissues present). There were no micro-calcifications or architectural distortion suggestive of malignancy bilaterally. However, a large totally radiolucent area was in the superior-lateral left breast measuring 18cm X 10cm and displaced the fibroglandular tissues medially and inferiorly. The overlying skin and nipple were normal bilaterally. A BI-RADS category of 0 was given.

Additional mammographic views of the mass (90^0 lateral & spot compression) were done to further characterize the mass and to rule out the possibility of a malignancy. It showed the mass to be completely lucent with only a small focus of vascular calcification and an oil cyst.

Sonomammogram of the mass showed a huge, wider than taller hypoechoeic mass within the outer upper quadrant of the breast. An ill-defined uniform margin was also visualized which separated this mass from the remaining normal scattered fibroglandular breast tissue. The axilla, overlying skin and nipple were sonographically normal. A final BI-RADS category 3 for the left breast and BI-RADS category 1 for the right was given. The patient was given a 6 month follow-up.

All mammographic and sonographic studies were repeated for only the left breast at follow-up. An increase in size of the mass from 18 X 10cm to 21cm X 14cm in diameter was noted.

At this point, a decision was taken to biopsy. An Ultrasound-guided core tissue biopsy using a 14 guage BARD biopsy apparatus was done. Histology showed the tissue to be composed of mature adipocytes and a diagnosis of a lipoma was made.

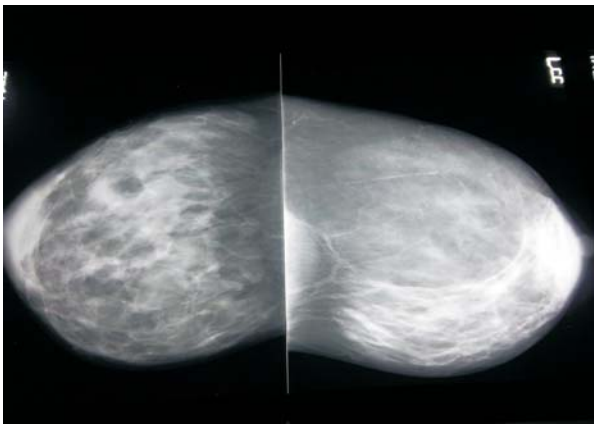

Figure 1: CC mammograms, lipoma in left breast

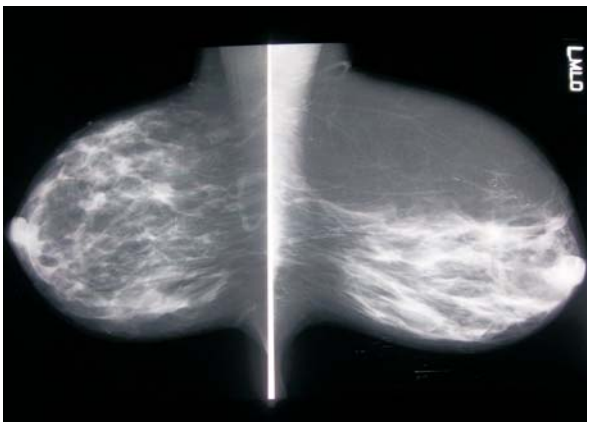

Figure 2: MLO mammograms with Giant lipoma in left Breast

She was referred to the surgeons who recommended an excision based on the rate of growth of the mass. The patient was given a 3 month follow-up appointment but failed to return.

DISCUSSION

Giant breast lipomas are rare and normally slow growing soft tumors, not attached to the skin or deeper tissues[4, 10]. Most lipomas of the breast have a diameter of about 2cm and rarely grow beyond 10cm. Giant lipomas of the breast occur infrequently and occasionally may enlarge rapidly to become huge masses[11].

Typically most lipomas of the breast are small, asymptomatic and coincidental discoveries on mammograms. When palpable, they are often small, oval, soft and painless masses with rarely additional symptoms[2, 4]. Our patient presented with a fast growing painless breast mass which raised the concern that we may be dealing with a malignant lesion of some form despite the absence of clinical features to suggest same.

Mammography is the mainstay and preferred method of imaging lipomas of the breast as their appearance of totally radiolucent lesion and absence of calcifications is diagnostic. Lipomas may be difficult to diagnose in large or postmenopausal breast due to the normal fatty background in such patients[4, 5, 10, 12] Though our patient had large breasts, she was premenopausal and her mammograms showed scattered fibroglandular parenchymal densities which may have aided in the ease of detecting this mass which in a completely fatty background, may have been missed. No microcalcifications were noted in the mammograms of the patient presented. On sonomammography, a circumscribed hypoechoiec oval mass with ill-defined margins was seen making this study unhelpful at confirming a lipoma. The usual features of a lipoma on ultrasound have been a rounded or oval isoechoiec to slightly hyperechoic mass with it appearing hypoechoiec only occasionally. Breast lipomas are not usually biopsied. However, if rapidly enlarging, a biopsy is then strongly indicated[13] as was the case in our patient.

The two main differentials we attempted to exclude were liposarcomas and pseudolipomas. Liposarcoma is an extremely rare, fast growing lesion and the only fat containing malignancy known[2]. While most are believed to arise de novo or as malignant components of another process such as phylloides tumors, they are never as a result of malignant transformation of a lipoma,[2, 12, 13]. Mammographically, they are lobulated, high density and usually indistinct[2], a sharp contrast to the appearance of breast lipomas. Pseudolipomas are uncommon masses with clinical features of a subcutaneous lipoma which are actually formed by and may conceal a slow growing breast carcinoma[3]. Though mammographic features of our patient were dissimilar to that of liposarcoma which is usually a lobulated hyperechoic mass, the sono-mammographic findings of our patient's breast mass were not.

Management of giant breast lipomas often requires surgical intervention for cosmetic reasons or to alleviate the symptoms of discomfort and heaviness[4]. Our Patient was referred to the surgeons for excision of the Lipoma based on their recommendation.

In conclusion, a rare case of a giant breast lipoma seen in our environment was reported. Although difficulties may be encountered in reaching a conclusive diagnosis in suspected cases of breast lipoma due to other fat containing lesions in the breast, radiological and histologic investigations have proved to be of immense importance in reaching a conclusive diagnosis in the index case. ■

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CASE REPORT

A GIANT VOCAL NODULE CAUSING HOARSENESS IN AN ADULT MALE: A CASE REPORT

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SUMMARY

A vocal cord nodule is a common non-neoplastic laryngeal lesion seen in teenagers and young adults. Also, voice abuse is a common aetiological agent and it presents usually with hoarseness as the only symptom. Fortunately, most patients with this condition can be treated conservatively. A case of a giant vocal cord nodule in a 35year old man who presented with hoarseness for 3 years was presented.

KEYWORDS: Giant, vocal cord nodule, hoarseness, adult

INTRODUCTION

A vocal cord nodule (singer`s or screamer`s or preacher's nodes) is a common laryngeal benign lesion and also a common cause of hoarseness in adults.[1,2] They are mostly seen in young female adults and male teenagers. The lesion is caused by stress or irritation due to inflammation, allergic or immunologic phenomena of the vocal cords.[3] They usually present with remitting hoarseness and/or other nonspecific laryngeal and/or pharyngeal symptoms. Treatment includes, voice therapy aimed at reducing stress on the vocal cords and teaching normal voice production. However, giant vocal nodules are not amenable to conservative therapy and are treated surgically. Microlaryngeal excision is a preferred surgical modality and has a better outcome. In a resource limited environment like Nigeria, however, where facilities for microlaryngeal surgeries are limited or unavailable, surgical excision using conventional laryngoscopes, light source and forceps is practiced.

We report a case of a giant right vocal cord nodule in a 35year old male farmer who presented with an unremitting hoarseness for 3 years.

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CASE SUMMARY

A 35-year old male farmer presented to our clinic with a 3-year history of remitting hoarseness which later became unremitting. It was preceded by an upper respiratory tract infection. There was an associated history of stridor, difficulty

with breathing, cough; productive of whitish sputum not blood stained, dysphasia, constant throat clearing and weight loss. Indirect laryngoscopy revealed a mass occupying the laryngeal vestibule with ulcerated surface obscuring both the false and true vocal cords on both sides. Plain x-ray soft tissue of the neck showed a round soft tissue shadow at the level of the larynx, with a slit-like air column posteriorly [figure 1].

Thereafter, he was prepared for elective tracheostomy, direct laryngoscopy and biopsy of the laryngeal mass. Intra-operative findings were a huge pedunculated polypoid mass with severe contact bleeding extending from the right supraglottic to the right vocal cord. The left vocal cord was free. The histology of the initial biopsy of the lesion revealed chronic non specific inflammation. However, the mass was excised completely via laryngofissure and the normal anatomy of the laryngeal structures was maintained. The histology of the mass revealed it was a laryngeal nodule; angiomatoid variant [figure 2].He was decanulated on the 5th post operative day with good vocalisation [figures 3]. Subsequently, he was seen four times on follow up and his voice was remarkably improved. Indirect laryngoscopy showed true vocal cord appeared normal in position and motility.

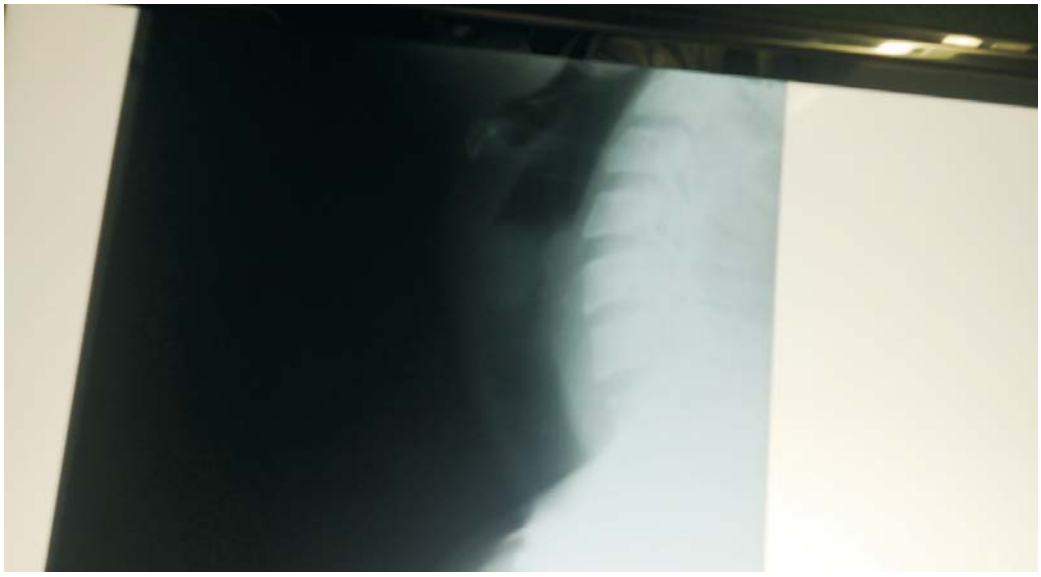

Figure 1: Lateral view soft tissue x-ray of neck showing a soft tissue mass at the laryngeal level with a slit of air column posteriorly.

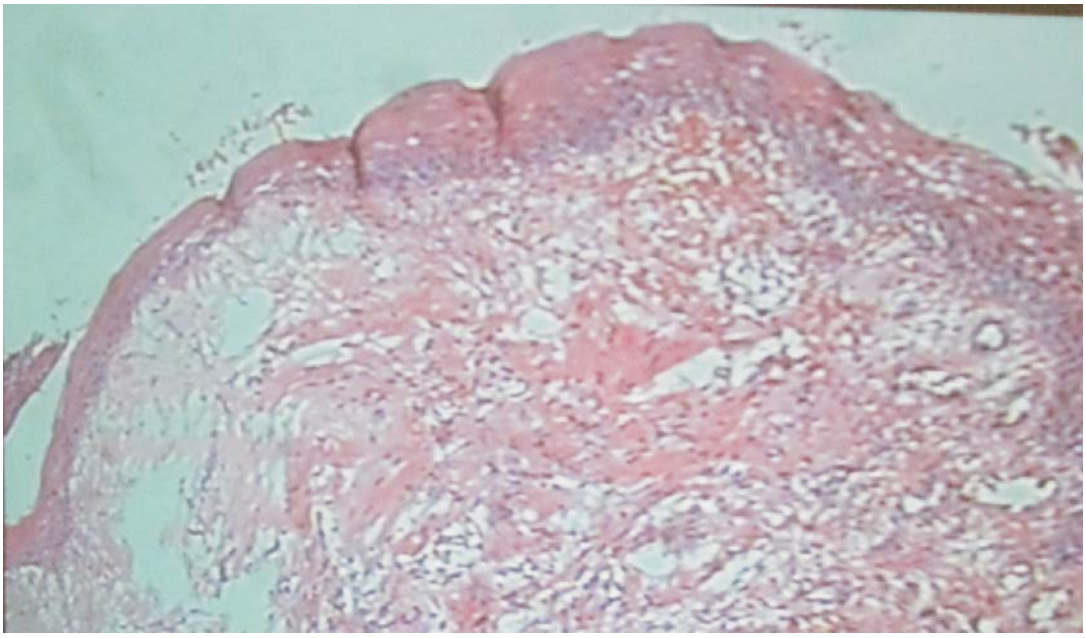

Figure 2: Photomicroph of Angiomatoid variant of laryngeal nodule [H&E X 128]

Figure 3: Lateral view soft tissue neck x-ray showing adequate laryngeal air column after laryngofissure and decanulation

DISCUSSION

Vocal cord nodule or polyp (laryngeal nodules, singer`s, preacher`s or screamer`s nodes) represents a non-neoplastic, vascular stromal reaction in the Reinkle`s space to phonotrauma in the form of vocal abuse (yelling), vocal overuse (excessive quantity of voice), and vocal misuse (vocal hyperfunction with excessive muscular tension.[4] A nodule is a small sessile lesion, usually less than 3 millimetres (mm) in its widest dimension, typically bilateral, symmetrical and immobile during phonation.[5-8] In contrast, a polyp may be sessile or pedunculated, usually larger than 3mm in its widest dimension, unilateral and, if pedunculated, mobile on phonation. The literature, however, indicate that vocal cord nodules and polyps are etiologically related and histologically identical, differing only in size.[9] If left untreated, any nodule has the capacity to develop into a polyp. The distinction between the two lesions on the basis of the above criteria, therefore, has no merit or clinical significance. The two terms can be used interchangeably or according to one`s bias.

Reinkle`s space is a gelatine like potential space in the vocal cord subepithelium containing loose fibrous and extracellular matrix. It is devoid of vessels and lymphatics, thus making this area susceptible to accumulation of fluids and proteins.[10] Vocal cord nodules are usually bilateral and symmetrical. There is a female predisposition which relates to the abnormalities in glottis closure in the female larynx.[11] On the contrary, vocal cord polyps are usually unilateral, sessile or pedunculated and have a male preponderance.

Vocal cord nodules usually occur at the junction of anterior third and middle third which is the point of maximum vibratory impact. Nodules form after repetitive tissue trauma from chief factors of phonotrauma. Smoking, gastroesophageal reflux, atmospheric pollutants and hypothyroidism may be additional contributing or aggravating factors.[11,12] In the index case the lesion was preceded by upper respiratory tract infection.

Pathology is characterised by the finding of stromal change-either myxoid or oedematous, fibrous vascular, usually underlying the stratified squamous epithelium.[10] Dilated vascular spaces or train of sparse haemorrhage may be present which is in keeping with our case; presence of contact bleeding and angiomatoid variant. Inflammatory cells infiltrate are infrequent and glandular element are absent. The squamous epithelium may be normal, atrophic or hyperkeratotic [13,14] or at times dysplastic. Ulceration of vocal nodules may be noted. Five histologic types of VCN or Ps are recognized: (i) oedematous-myxoid, (ii) fibrous, (ii) hyaline (amyloid-like), (iv) vascular, and (v) mixed.[9]

If trauma persists, acute inflammation becomes chronic with thickening affecting the epithelium and submucosal hyalination. These changes are not reversible.

VCN or Ps affects both sexes and all age group, with a peak incidence between 20 and 50years. Presenting symptoms range from remitting (intermittent) or unremitting (permanent) hoarseness, as in the index case. Patients often complain that their voice fatigues easily and that it is best

first in the morning and worse with prolonged speaking or signing.[6] Airway compromise is not a significant issue. Sometimes others associated nonspecific pharyngeal symptoms: frequent throat clearance, sore throat, coughing etc.

On laryngoscopy, the vocal cord nodules are usually bilateral, shining white, pearly gray, tan, or red growths with a wide base and located at the junction of the anterior third and the middle third of the vocal cord, rarely exceeding 15mm in greatest dimension. It is white and fibrotic in chronic ones. On strosboscopy- chronic nodule stop mucosal wave projection. Although otolaryngologists are highly adept in recognizing vocal cord nodules, other lesions such as keratosis, squamous papilloma or even amyloid may be mistaken for these lesions. [15]

Treatment involves voice therapy aimed at eliminating phonotrauma. It is also directed at reducing stress and teaching normal voice production. Majority of vocal cord nodules either resolve or are greatly improved. Only in rare instance a microlaryngeal excision is required. However, giant vocal nodules are not amenable to conservative therapy and are treated surgically. Microlaryngeal excision is a preferred surgical modality and has a better outcome. In a resource limited environment like Nigeria, however, where facilities for microlaryngeal surgeries are limited or unavailable, surgical excision using conventional laryngoscopes, light source and forceps is practiced. In the reported case the lesion was excised via laryngofissure because of the vascular nature of the lesion.

Rehabilitation (remove source of the stress and vocal rest) and vocal hygiene (lubrication of the cords, hydration and respiratory coordination) are the main stay in prevention of recurrence. Surgery is indicated in cases where the hoarseness is not acceptable for the patient or when the nodule does not disappear after speech therapy.

Polyps are usually larger than nodules, with a wide or a narrow pedicle and may have contact lesion in the contralateral vocal cord.[1] In laryngeal polyps, medical treatment is not important other than removing the possible harmful sources. It is treated through surgical excision. Microsurgical technique is directed to the polyp, removal by cutting the pedicle and avoiding disrupting the voice ligaments. Endoscopic laser removal has also been proposed.[1] ■

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