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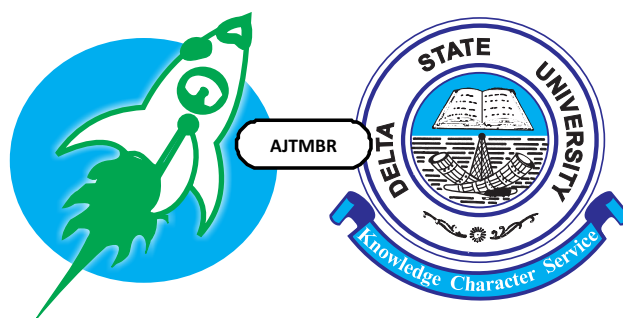
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Focus and Scope

The African Journal of Tropical Medicine and Biomedical Research is a multidisciplinary and international journal published by the College of Health Sciences, Delta State University of Abraka, Nigeria. It provides a forum for Authors working in Africa to share their research findings on all aspects of Tropical Medicine and Biomedical Sciences and to disseminate innovative, relevant and useful information on tropical medicine and biomedical sciences throughout the continent. The journal will publish original research articles, reviews, editorials, commentaries, short reports, case reports and letters to the editor. Articles are welcome in all branches of medicine and dentistry including basic sciences (Anatomy, Biochemistry, Physiology, Pharmacology, Psychology, Nursing etc) and clinical sciences (Internal Medicine, Surgery, Obstetrics and Gynaecology, Dental surgery, Child Health, Laboratory Sciences, Radiology, Community Medicine, etc). Articles are also welcome from social science researchers that document the intermediating and background social factors influencing health in countries of Africa. Priority will be given to publication of articles that describe the application of the principles of primary health care in the prevention and treatment of diseases.

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Methidathion, Chlorpyrifos And Diazinon Organophosphorus Toxicity in Chicken

Ojezele MO[1]; Abatan MO[2]*

ABSTRACT

Background: The usefulness of pesticides cannot be overemphasised as they reduce the effect of diseases that are transmitted by insect-pests like mosquitoes, tsetse flies, ticks, lice and fleas. However, there are documented evidences of untoward effects on non-target organisms. The aim of this study is to evaluate the effects of three commonly used organophosphorus pesticides (methidathion, chlorpyrifos and diazinon) on haematology and clinical parameters of cockerels. This is expected to serve as indices of effect on production.

Materials and methods: A total of 20 cockerels were randomly assigned into 4 groups (n=5) and administered the agents orally, once daily for 42 days. Group 1 served as control, group two received methidathion (7.5mg/kg), group 3 chlorpyrifos (3.5 mg/kg) and group 4 diazinon (1.5 mg/kg). Paired blood samples obtained from the experimental birds were subjected to haematological and liver enzyme assays. Liver enzymes were analysed using Randox kits.

Results: The agents under study caused significant decrease in PCV (packed cell volume) ($P < 0.05$); WBC (white blood cell count) ($P < 0.05$) and lymphocyte count ($P < 0.05$) in the birds. Also observed was increased Hb (haemoglobin concentration) ($P < 0.05$) and neutrophil count. There was an increase in the level of serum ALP (alkaline phosphatise), ALT (alanine transaminase), ALB (albumin) and BIL (bilirubin). Also observed were decreased AST (aspartate transaminase), TP (total protein) ($P < 0.05$) and GLB (globulin) ($P < 0.05$).

Conclusion: The pesticides caused deleterious effects on some haematological parameters and biomarkers of organ toxicity. There is need, therefore, to be cautious in the use of pesticides and to develop alternative means of pest control.

Key Words: *Birds; Pests; Pesticides; Toxicity; Blood; Liver Enzymes*

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INTRODUCTION

Pesticides have been described as designs such as devices, organisms and chemicals programmed to attract, deter or annihilate pests [1]. Pests in this regard include anything considered to be nuisance to man. They are plants or organisms that affect man directly, residing on or in the human body to reduce the quality of life. In extreme cases, they can lead to loss of human lives. On the other hand, pests can affect man indirectly by residing in the environment or on animals that are useful to man. In some instances, the pests can find their way to human and cause bodily harm in which case they are said to be zoonotic [2]. Aside the tendency of being zoonotic, pests that infest domesticated animals can reduce the productivity of animals reared for food and life expectancy of pets [3]. Pesticides, therefore, have been useful in saving lives of humans and animals; and indirectly, improving life expectancy. The usefulness of pesticides cannot be overemphasised as they reduce the effect of diseases that are transmitted by insect pests like mosquitoes, tsetse flies, ticks, lice and fleas [4].

In spite of their numerous usefulness, evidence abound that the use of pesticides is abused

globally [5]. Some pesticides are characteristically persistent in the environment with the tendency to be available to cause harm to living organism long after application [6]. Some can also bio-accumulate and increase in concentration or build up in environmental media with repeated application [7].

In the light of these, pesticides can adversely impact the ecosystem by having untoward effect on human, non-target species like wildlife, domesticated animals, fish and human environment. To reduce the negative impact of pesticides, IPM (Integrated Pest Management) measures, encompassing chemical, biological, cultural and behavioural, aimed at pest management in a most socially accepted and environmentally cost-effective manner, were proposed [8].

According to IPM, use of pesticides is reserved for pests that cannot be managed by other methods. In this approach pesticides that are narrow spectrum, selective and non-persistent are preferred. The aim is responsible pesticide use for maximum impact, for a short time and with effect over a contained area. This expectedly will prevent adverse effects on non-target organisms including man and animals; and preservation of the ecosystem.

In livestock production, pesticides are employed to control environmental pests and endo-parasites of the domesticated animals. This often times lead to unintentional accidental exposure of farm animals to pesticides leading to death in acute cases or reduced production in long-term exposure to sub-lethal doses [9]. Reports abound of the hazardous effects of pesticides in experimental animals, wildlife and humans especially in acute exposure [10,11,12].

The findings also reported sub-lethal exposure in wildlife and humans leading to impaired endocrine process. The aim of this study is to evaluate the effects of two commonly used organophosphorus pesticides on haematology and clinical parameters in cockerels. This is expected to serve as indices of effect on production. This may also be an assessment of the reliability of the parameters as useful biomarkers of effects and contact for pesticides.

Materials And Methods

Procurement and Management of Experimental Birds and Chemicals
Chemicals were procured from reputable local vendor. Day old cockerels were procured from a foremost hatchery in South-west Nigeria. The birds were raised to 8 weeks old. A total of 20 birds were randomly selected and assigned into one of 4 groups . Group 1 served as control and received the vehicle, distilled water. Groups 2 was administered methidathion (7.5mg/kg), group 3 chlorpyrifos (3.5 mg/kg) and group 4 diazinon (1.5 mg/kg). Drug dosage was according to the study of Ojezele and Abatan [13]. All administration was done orally, once daily for 42 days. The experiment was terminated on the 43rd day. Paired blood samples were collected from each bird and subjected to haematological and clinical chemistry assays. Clinical parameters were performed with kits supplied by Randox laboratory Ltd., UK)

Data management
Data are presented as mean ± standard error of mean and analysed using SPSS 15 (SPSS Inc. Chicago, Illinois, USA) at $P < 0.05$ level of significance.

Results
The effects of the organophosphorus compounds on clinical chemistry of birds are presented in Table 1. It was observed that administration of the compounds caused increase in serum level of ALP (alkaline phosphatase), ALT (alanine transaminase), ALB (albumin) and BIL (bilirubin). Also observed were decreased AST (aspartate transaminase), TP (total protein) $P < 0.05$, compared with the control.

The results of the effects of the organophosphorus compounds on the haematological parameters of the birds are shown in table 2. Results showed that administration of the organophosphorus compounds (chlorpyrifos, methidathion and diazinon) caused significant decrease in PCV (packed cell volume) ($P < 0.05$) compared with the control; WBC (white blood

cell count) (P < 0.05) compared with the control and lymphocyte count in the birds, P < 0.05 compared with the control group. It was also observed that there was increased Hb (haemoglobin) concentration and neutrophil count in birds administered the organophosporus compounds compared with the control (Table 2)

Table 1: Changes in liver function markers following administration of chlorpyrifos, methidathion and diazinon to cockerels

Group	BIL (mg/dl)	ALP (IU/L)	AST (IU/L)	ALT (IU/L)	TP (g/dl)	ALB (g/dl)
Control	0.18±0.04	14.43±3.28	44.66±1.46	13.40±2.54	3.30±0.36	1.06±0.17
Methidathion	1.00±0.17*	16.17±2.94*	32.12±4.89*	15.80±1.70*	3.06±0.35*	1.21±0.25*
Chlorpyrifos	1.10±0.08*	18.83±2.40*	24.28±1.79*	19.20±3.00*	3.04±0.21*	1.26±0.07*
Diazinon	0.93±0.21*	21.40±3.49*	26.06±4.63*	17.60±2.40*	3.06±0.09*	1.22±0.08*

*P<0.05 compared with control
BIL= Bilirubin, ALB= Albumin, TP= Total protein, ALP= Alkaline phosphatise, ALT= Alanine aminotransferase,
AST- Aspartate aminotransferase, GLB= Globulin

Table 2: Changes in some haematological parameters following administration of chlorpyrifos, methidathion and diazinon to cockerels

Group	PCV (%)	Hb (g/dl)	WBC (×10³/µL)	RBC (×10⁶/µL)	NEUT (×10³/µL)	LYM (×10³/µ
Control	28.80±0.58	9.28±0.23	2.48±0.74	2.26±1.10	0.93±0.19	1.45±0.5
Methidathion	26.10±1.22*	9.50±0.40*	2.28±0.33*	2.11±2.71*	1.02±0.18*	1.14±0.1
Chlorpyrifos	25.20±1.02*	9.40±0.33*	2.14±0.63*	2.15±7.91*	1.04±0.14*	1.05±0.3
Diazinon	24.00±1.00*	9.45±0.36*	2.12±0.46*	1.95±1.64*	1.03±0.10*	1.06±0.4

*P<0.05 compared with control
PCV= Packed Cell Volume, Hb = Haemoglobin, WBC= White Blood Cells, RBC=Red Blood Cells,
NEUT= Neutrophils; LYMP=Lymphocytes

DISCUSSION

As xenobiotics with potential for toxicity, pesticides are a source of death and sub-clinical ill-health manifesting as decreased production in livestock [14]. Often times, the resulting plunge in production may not be immediately traced to exposure of livestock to these compounds owing to myriads of aetiology that can be linked to change in production [15].

In the present study, liver enzyme activities were used to assess the effect of three commonly used pesticides (chlorpyrifos, methidathion and diazinon) on liver integrity and function (Table 1).

The liver is a major organ involved in detoxification and metabolism in the body. Toxicants can influence and affect its structural integrity and function [16]. This presents either as increased serum level of proteins produced by the liver in the plasma when structural integrity is compromised, or as decreased level of liver proteins stems from adverse effect of toxicants on the production capacity of the liver. The observed increase in ALP (alkaline phosphatase) and ALT (alanine transaminase) activities may be attributed to a compromise of the integrity of the liver structure by the organophosphorus compounds administered to the experimental birds [17]. This may have led to a leakage into the plasma of these enzymes. The observed decrease in AST (aspartate transaminase) activity may be a reflection of the adverse effect of the toxicants on the functional ability of the liver to synthesize the enzyme.

Albumin, a plasma protein produced by the liver and excreted by the kidney, is a useful indicator of the synthetic ability of the liver and the excretory ability of the kidney [18]. The small molecular size of albumin endows it with the potential of indicator of glomerular membrane integrity. In the event of increased mobilization of protein to cope with stressful conditions [19], the glomerulus may be overwhelmed in its excretory function. Ultimately, this may lead to impaired renal function if the assault progresses unabated. Hence, the increased albumin level observed in the present study coupled with decreased total protein may be attributed to mobilization of protein produced by the liver leading to overwhelming pressure on the excretory function of the kidney. The toxicants (organophosphorus compounds) caused reduced appetite and intake of protein. The body in a bid to meet the metabolic demands mobilizes endogenous protein with attendant cascade of events. Immune globulins are involved in humoral immunity [20]. In the event of a decrease in its plasma level, the body immune system will be compromised making it prone to opportunistic infections and other exogenous pathogenic microorganism which the immune system would otherwise have taken care of. It may be inferred that the observed decrease in total plasma globulin of birds administered the toxicants may make the birds prone to infections compounding the organ-toxicity caused by the toxicants.

Haematological parameters are indices of the health status of the body [21]. In the present study it may be inferred that the toxicants caused haemolysis evident by the observed decreased red blood cell counts and increased plasma Bilirubin of birds administered the toxicants. Haemolysis beyond the immediate capacity of the organs (liver and kidney) necessary for conjugation and excretion may lead to increased plasma bilirubin [22] as observed in this study. The overwhelming haemolysis may also be responsible for increased haemoglobin concentration. The observed organ-toxicity (caused by the toxicant) and increased bilirubin may have further worsened the health status of the birds. The observed decrease in lymphocyte counts further attests to the immunosuppressive effect of the toxicant.

So, given the myriads of deleterious effects that the pesticides under study caused which apparently will affect production immediately and may lead to death ultimately, there is need for research into alternative means of pest control, and for caution in the use of pesticides.

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Anthropometric Study of the Lips in Relation to Age among Urhobo People of South-South Nigeria

[1]; Omoregie IS[2]

ABSTRACT

Background: The lips are facial anatomical structures that control the orifice of the mouth due to the presence of complex strands of skeletal muscles. Their features make it possible for identification. The study was undertaken to assess the dimensions of the lips in relation to age and gender, among Urhobo people of South-south Nigeria.

Methods: It was a cross-sectional study involving 770 subjects, aged 1 day to 30 years, based on the simple cum proportional stratified random sampling techniques. The subjects were categorised into day 1- <1 year, 1-5 years, 6-12 years, 13-19 years and 20-30 years age groups. Cupids bow width, mouth width; upper vermilion height, lower vermilion height, philtrum height and length from the tip of cupid's bow to commissure were measured in millimetre. A t-test was used to ascertain sexual dimorphism and one-way ANOVA to find out significant age changes in dimensions of parameters, using SPSS 20.

Results: In the majority of parameters measured, males were statistically significantly greater than females. There was a significant incremental growth of mean parameters measured from newborn age through the young adult age in most of the parameters across all age groups.

Conclusion: This will be relevant to the Orthodontist and maxillofacial surgeons.

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INTRODUCTION

The lips are very important components of the face; the centre of each possesses complex strands of skeletal muscles, the activity of which modifies their profile and controls orifice of the mouth [1]. Besides facilitating digestion and confinement of food within the oral cavity, it assists in pronunciation and betrays emotions [2].

The lips form the focal point of the lower third of the face. The morphology of the vermillion is subject to variation based on ethnic, gender and personality characteristic[1], hence relevant in identification. The neighbourhoods of the lips, i.e. nasolabial and labio-mental grooves also define age; older appearance is presented by deep grooves.

Studies on lip dimensions have been carried out in different populations of the world [2-8], with related or different foci, adopting the direct[4], radiographic [5] and photographic [7] methods. The direct method is relatively simple and affordable as a large number of study subjects can be assessed and the outcome generalized as compared to the radiographic and photographic methods that are cost-intensive. Few of these studies exist in Nigeria [4,5], and they reported that lip dimensions are higher in males than in females. However, none of these previous studies focused on the effect of age on the parameters measured. In addition, literature search indicates that this

study has not been conducted among the Urhobo people. This gap in the literature is what this study intends to close.

The study will be of great significance to population variation studies, and indeed Biological anthropology. It will be of relevance to the orthodontist involved in the repositioning of mal-align dentition, and maxillofacial surgeons who are involved in the repair or surgery of the lip. The data will also be useful in evaluation and management of congenital anomalies in newborns. The aim of this study was to assess the dimensions of the lips in relation to age and gender, among Urhobo people of South-south Nigeria.

Materials and Methods

Study Design and Study population

This was a cross-sectional anthropometric study conducted in 2012. The study population was drawn from all individuals, 1 day to 30 years old, in the various immunisation centres, nursery, primary and secondary schools, as well as the University in the study area, who belong to the Urhobo ethnic group. These study centres were of interest because the different age categories: newborn (day 1 - <1 year), pre-school (1-5 years), school (6-12 years), teen (13-19 years) and young adult (20-30 years) were respectively readily accessible therein. This age categorization is in accordance with a previous study [9]. These sub-groupings became necessary to avoid mixing subjects of dissimilar subpopulation centres. This ensured homogeneous data to reflect individual subpopulation. A subject was classified as an Urhobo person if the family pedigree study indicated that parents up to the second generation belong to the Urhobo ethnic group.

Sample and Sampling Technique

The sample size was 770 individuals categorised into 5 groups. The simple random sampling technique was used to select three immunisation centres, four pre-schools/Nursery schools, 4 secondary schools and the University. At each centre, subjects were stratified proportionately

into males and females; and finally, subjects were selected based on the simple random sampling technique. The age of each participant was confirmed from the appropriate records in the various centres.

Informed consent was obtained from subjects or legal representatives in accordance with International guidelines [10]. The Research and Ethics Committee of College of Health Sciences, Delta State University, approved the research methods.

Method of Data Collection

The following parameters of the lips were measured: cupids bow width (CC), inter-commissure or mouth width (BB), upper vermilion height (DE), lower vermilion height (EF), philtrum height (AC) and length from the tip of cupid's bow to commissure (BC) (Figure 1). The subject was advised to sit upright relaxed with their head in the Frankfurt plane (Figure 2). In cases of the babies, measurements were carried out when lying down in an anatomical position. A digital vernier caliper (Mitutoyo, Japan), was used for taking the measurement. All measurements were undertaken by only one observer, and each measurement was taken twice to reduce the error of measurements. Subjects who had undergone surgery of the lips, anomalies such as cleft lip and palate and any other pathology of the lips were excluded.

In order to estimate the error of measurement, 20 subjects who were not part of the study population were randomly selected and measured twice on two different days, for each parameter. Error of measurement was calculated according to the formula proposed by Dahlberg (1940) [11]:

$$D = \sqrt{\sum_{i=1}^{N} \frac{d_i^2}{2N}}$$

Where d_i is the difference obtained from the two repeated measurements, and N is the number subjects sampled. The error of measurements for cupids bow width, inter-commissure, upper vermilion height, lower vermilion height, philtrum height and length from the tip of cupid's bow to commissure, was 0.02 in each case. This value is even less than one-tenth of a millimeter. The findings indicate that the errors were so

minimal to bias the results.

The data obtained were subjected to statistical analysis with the aid of SPSS 20. Descriptive statistics like mean and standard deviation were used to summarize the data. Inferential statistics were also used; independent samples t-test to determine the significant difference between male and female genders, and one-way analysis of

Figure 1. Lips and dimensions measured.

A-C = Philtrum Length;
C-C = Cupid's bow width;
B–B = Mouth width;
D-E= Upper vermilion height;
E-F= Lower vermilion height;
B-C = Tip of Cupid's bow to commissure.
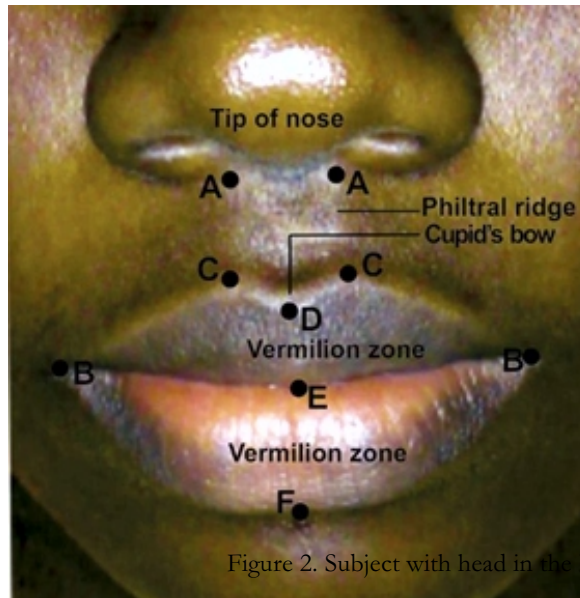
Figure 2. Subject with head in the Frankfurt plane during a measurement.

Figure 3. Distribution of study subjects based on age groups and gender.
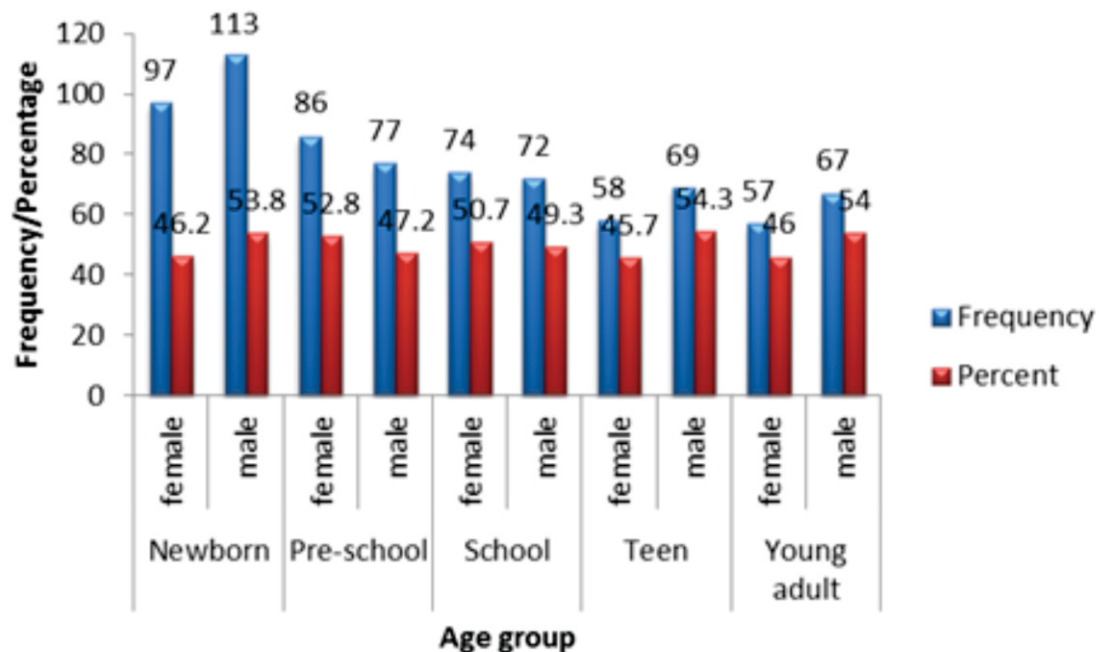
variance for multiple comparisons of the age groups.

Figure 3 shows the distribution of study subjects based on age categories and gender. It indicates that 27.3% (210), 21.2% (163), 19.0% (146), 16.5% (127) and 16.1% (124) of the sample were in newborn, pre-school, school, teen and young adult age group respectively. Results show mean (SD) age in years for newborn, pre-school, school, teen and young adult age groups were 0.27(0.23), 3.64(1.24), 9.14(2.09), 16.70(1.61) and 22.87(1.77) respectively. Figure 3 also shows that 51.7% (398) were males while 48.3% (372) were female subjects.

Table 1 shows the descriptive statistics of all parameters measured in newborn, pre-school and school age groups. In all the parameters, the mean dimensions in males were greater than in females. Table 2 shows the comparison of all the parameters measured in teen and young adult age groups. Except for upper vermilion height that was greater in females, the mean dimensions of all the parameters measured were greater in males.

Table 3 shows independent samples t-tests between males and females in all the age groups studied. It indicates that the mean differences in dimensions between males and females were statistically significant, except philtrum height in newborns, length from tip of cupid's bow to commissure in pre-school age group, lower vermilion and philtrum heights in school age group, upper vermilion height and length from tip of cupid's bow to commissure in teenage group, and upper vermilion height and lower vermilion height in young adult age group.

Results of one-way analyses of variance showed that except for 'length from the tip of cupid's bow to commissure', tests of homogeneity of variances were significant in cases of cupids bow width, commissure width, upper vermilion height, lower vermilion height, and philtrum height' (P<0.05). Hence the Tukey HSD and Tamhane post hoc statistics were used respectively. Table 4 shows pairwise multiple comparisons of the age group means for cupids bow width, commissure width and upper

Table 1. Descriptive statistics of parameters in Newborn, Pre-school and School age groups.

Age group	Sex	Parameter	N	Minimum	Maximum	Mean	Std. Deviation
Newborn	female	cupids bow width	97	3.26	7.91	5.05	0.94
		cummissure width	97	21.27	37.31	28.32	3.25
		upper vermillion height	97	3.38	8.95	5.10	1.09
		lower vermillion height	97	3.68	9.28	6.13	1.05
		philthral height	97	5.28	12.50	9.31	1.43
		Tip of cupid's bow to commissure	97	10.25	21.35	14.77	2.07
	male	cupids bow width	113	2.88	8.52	5.56	1.23
		cummissure width	113	22.10	38.60	30.80	3.40
		upper vermillion height	113	3.40	10.77	5.74	1.54
		lower vermillion height	113	3.95	10.67	6.69	1.41
		philthral height	113	6.48	14.93	9.59	1.63
		Tip of cupid's bow to commissure	113	10.13	23.10	15.88	2.49
Pre-school	female	cupids bow width	86	6.83	11.81	8.46	1.01
		cummissure width	86	29.95	43.68	38.15	3.12
		upper vermillion height	86	5.39	11.73	8.43	1.05
		lower vermillion height	86	5.90	11.58	9.30	1.16
		philthral height	86	8.68	14.47	11.21	1.37
		Tip of cupid's bow to commissure	86	15.03	27.24	20.27	2.26
	male	cupids bow width	77	7.26	12.71	9.37	1.37
		cummissure width	77	34.05	48.43	40.15	3.60
		upper vermillion height	77	7.14	11.51	8.93	0.90
		lower vermillion height	77	8.36	12.09	9.84	1.04
		philthral height	77	8.06	19.01	12.50	2.59
		Tip of cupid's bow to commissure	77	15.64	26.22	20.91	2.50
School	female	cupids bow width	74	7.60	12.61	10.61	1.00
		cummissure width	74	28.87	54.55	45.18	4.24
		upper vermillion height	74	6.04	13.36	9.24	1.45
		lower vermillion height	74	5.55	14.84	10.78	1.61
		philthral height	74	9.47	16.15	12.89	1.64
		Tip of cupid's bow to commissure	74	18.36	30.35	24.44	2.26
	male	cupids bow width	72	7.92	13.69	11.12	1.14
		cummissure width	72	38.90	62.56	47.82	4.75
		upper vermillion height	72	7.04	13.78	10.04	1.43
		lower vermillion height	72	7.50	15.83	10.96	1.58
		philthral height	72	8.75	17.43	12.99	1.90
		Tip of cupid's bow to commissure	72	20.01	30.87	25.50	2.41

vermilion height, post hoc tests of analysis of variance. Table 5 also shows multiple comparisons of age groups post hoc tests of analysis of variance for lower vermilion height, philtrum height and length from the tip of Cupid's bow to commissure. There were incremental growth of mean parameters measured from newborn age through young adult

Table 2. Descriptive statistics of parameters in teenaged and young adult age groups.

Age group	Sex	Parameter	N	Minimum	Maximum	Mean	Std. Deviation
Teen	female	cupids bow width	58	8.65	14.92	11.06	1.60
		cummissure width	58	40.69	58.28	51.60	3.63
		upper vermillion height	58	7.42	14.78	10.82	1.46
		lower vermillion height	58	10.07	15.60	12.47	1.34
		philthral height	58	8.98	17.00	12.88	1.84
		Tip of cupid's bow to commissure	58	21.18	31.72	27.86	2.01
	male	cupids bow width	69	9.65	70.96	13.47	7.13
		cummissure width	69	43.75	60.94	53.81	4.22
		upper vermillion height	69	7.50	15.44	10.76	1.57
		lower vermillion height	69	9.93	17.56	13.17	1.82
		philthral height	69	9.30	20.75	13.77	2.07
		Tip of cupid's bow to commissure	69	22.77	34.27	28.47	2.20
Young adult	female	cupids bow width	57	8.64	13.16	10.78	1.09
		cummissure width	57	48.61	61.78	54.47	3.17
		upper vermillion height	57	7.90	14.52	11.33	1.41
		lower vermillion height	57	10.37	15.73	12.65	1.28
		philthral height	57	9.41	17.95	13.18	1.73
		Tip of cupid's bow to commissure	57	25.48	35.22	30.11	1.77
	male	cupids bow width	67	9.79	15.15	12.35	1.17
		cummissure width	67	50.70	64.63	58.31	3.44
		upper vermillion height	67	9.00	15.14	11.64	1.37
		lower vermillion height	67	10.73	16.65	12.97	1.23
		philthral height	67	10.84	18.20	14.22	1.59
		Tip of cupid's bow to commissure	67	26.76	39.06	31.55	2.23

age and the differences were significant ($p<0.05$) (Tables 4 and 5), except cupids bow width between young adult and teenage group ($p>0.05$) (Table 4); lower vermilion height between young adult and teenage group, philtrum height between teen and school age, as well as between young adult and teenage group ($p>0.05$) (Table 5).

Table 3. Test of significant gender differences in all parameters measured.

Age group	Parameter measured(mm)	t	Df	Mean difference	Sig. (2-tailed)
Newborn	cupids bow width	3.40	208	0.51**	0.001
	cummissure width	5.38	208	2.48**	0.000
	upper vermillion height	3.52	208	0.64**	0.001
	lower vermillion height	3.26	208	0.56**	0.001
	philthral height	1.34	208	0.29*	0.182
	Tip of cupid's bow to commissure	3.48	208	1.11**	0.001
Pre-school	cupids bow width	4.86	161	0.91**	0.001
	cummissure width	3.78	161	1.99**	0.001
	upper vermillion height	3.22	161	0.50**	0.002
	lower vermillion height	3.11	161	0.54**	0.002
	philthral height	3.92	161	1.29**	0.001
	Tip of cupid's bow to commissure	1.73	161	0.64*	0.086
School	cupids bow width	2.92	144	0.52**	0.004
	cummissure width	3.55	144	2.65**	0.001
	upper vermillion height	3.38	144	0.81**	0.001
	lower vermillion height	0.70	144	0.19*	0.484
	philthral height	0.31	144	0.09*	0.759
	Tip of cupid's bow to commissure	2.72	144	1.05**	0.007
Teen	cupids bow width	2.52	125	2.41**	0.013
	cummissure width	3.13	125	2.21**	0.002
	upper vermillion height	-0.19	125	-0.05*	0.847
	lower vermillion height	2.46	125	0.71**	0.015
	philthral height	2.54	125	0.89**	0.012
	Tip of cupid's bow to commissure	1.63	125	0.62*	0.105
Young adult	cupids bow width	7.72	122	1.57**	0.001
	cummissure width	6.44	122	3.85**	0.001
	upper vermillion height	1.24	122	0.31*	0.216
	lower vermillion height	1.42	122	0.32*	0.160
	philthral height	3.50	122	1.05**	0.001
	Tip of cupid's bow to commissure	4.00	122	1.44**	0.001

Table 4. Multiple Comparisons of Post Hoc tests of Analysis of Variance.

Parameters measured (cm) Statistic		(I) Age group	(J) Age group	Mean Difference (I-J)	Std. Error	Significance
cupids bow width	Tamhane	Newborn	Pre-school	-3.57**	0.13	0.001
			School	-5.54**	0.12	0.001
			Teen	-7.045**	0.49	0.001
			Young adult	-6.31**	0.15	0.001
		Pre-school	School	-1.97**	0.14	0.001
			Teen	-3.478**	0.50	0.001
			Young adult	-2.79**	0.16	0.001
		School	Teen	-1.51**	0.49	0.027
			Young adult	-0.77*	0.15	0.001
		Teen	Young adult	0.74*	0.50	0.786
cummissure width	Tamhane	Newborn	Pre-school	-9.44**	0.37	0.001
			School	-16.83**	0.46	0.001
			Teen	-23.15**	0.44	0.001
			Young adult	-26.89**	0.42	0.001
		Pre-school	School	-7.39**	0.47	0.001
			Teen	-13.71**	0.45	0.001
			Young adult	-17.45**	0.44	0.001
		School	Teen	-6.31**	0.53	0.001
			Young adult	-10.06**	0.52	0.001
		Teen	Young adult	-3.75**	0.50	0.001
upper vermillion height	Tamhane	Newborn	Pre-school	-3.23**	0.12	0.001
			School	-4.19**	0.16	0.001
			Teen	-5.34**	0.16	0.001
			Young adult	-6.05**	0.16	0.001
		Pre-school	School	-0.96**	0.15	0.001
			Teen	-2.12**	0.16	0.001
			Young adult	-2.83**	0.15	0.001
		School	Teen	-1.15**	0.18	0.001
			Young adult	-1.87**	0.18	0.001
		Teen	Young adult	-0.71**	0.18	0.001

**Significant ($p<0.05$); *Not significant($p>0.05$).

Table 5. Multiple Comparisons of Post Hoc tests of Analysis of Variance

Parameters measured (cm) Statistic		(I) Age group	(J) Age group	Mean Difference (I-J)	Std. Error	Significance
	Tamhane	Newborn	Pre-school	-3.12**	0.13	0.001
			School	-4.44**	0.16	0.001
lower vermillion height			Teen	-6.42**	0.17	0.001
			Young adult	-6.39**	0.14	0.001
		Pre-school	School	-1.31**	0.16	0.001
			Teen	-3.29**	0.17	0.001
			Young adult	-3.27**	0.14	0.001
		School	Teen	-1.98**	0.20	0.001
			Young adult	-1.96**	0.17	0.001
		Teen	Young adult	0.03**	0.19	1.00
	Tamhane	Newborn	Pre-school	-2.36**	0.20	0.001
			School	-3.48**	0.18	0.001
philthral height			Teen	-3.90**	0.21	0.001
			Young adult	-4.28**	0.19	0.001
			School	-1.12**	0.22	0.001
		Pre-school	Teen	-1.54**	0.24	0.001
			Young adult	-1.92**	0.23	0.001
		School	Teen	-0.43*	0.23	0.490
			Young adult	-0.80**	0.21	0.002
		Teen	Young adult	-0.38*	0.24	0.700
		Newborn	Pre-school	-5.20**	0.24	0.001
			School	-9.59**	0.25	0.001
			Teen	-12.82**	0.26	0.001
Tip of cupid's	Tukey		Young adult	-15.52**	0.26	0.001
bow to commissure	HSD	Pre-school	School	-4.39**	0.26	0.001
			Teen	-7.62**	0.27	0.001
			Young adult	-10.32**	0.27	0.001
		School	Teen	-3.23**	0.28	0.001
			Young adult	-5.93**	0.28	0.001
		Teen	Young adult	-2.70**	0.29	0.001

**Significant ($p<0.05$); *Not significant($p>0.05$).

Discussion

This present study focused on the effects of gender and age on dimensions of the lips. The significant gender dimorphism expressed in favour of males in the majority of parameters in all the age groups indicates that gender factors affecting body structures are at play. The facial skeletal dimension, especially during the teenage and young adult age groups which are known to be higher in males, could have prompted a corresponding response of the lips. None-theless, philtrum height in newborn, length from the tip of cupid's bow to commissure in pre-school age, lower vermilion height and philtrum height in school age, upper vermilion height and length from the tip of cupid's bow to commissure in teenage, and upper and lower vermilion height in young adults exhibited sexual independence. Although it is reasonable to portend that those factors innate or intrinsic to the general study population may be responsible. The results are at variance with Agnihotri and Singh [12] in a study in Punjab, India among neonates and infants, as they reported a significant sexual dimorphism in length of philtrum (though methods of measurement are different); while no significant gender differences between males and females in the cases of Cupid's bow and inter-commissural width. The variations observed may be attributed to genetic and environmental factors.

The result of the present study is in line with Ngeow and Aljunid [13] and Emelike et al. [4], who reported significant sexual dimorphism in inter-commissural width among young adult Malaysian Indians and Igbo of Nigeria respectively. Emelike et al. [4] also reported a significant sexual dimorphism in Cupid's bow width, which is supported by the present study. The present study is at variance with Ngeow and Aljunid [13] in that the latter reported a significant sexual dimorphism in upper and lower vermillion heights. In a study of the lip-nose complex in India, Khanddekar et al. [3] reported wider dimensions in males than females in neonates, 1 year, 12 years old and adults. They also observed Cupid's bow were wider in males compared to females, except at 12 years old that female were wider. The mean values of inter-commissural width and total vermilion height of adult Urhobo in this study are higher than in the two ethnic descents in of Sistani and Baluch [6]. Genetic, environmental, geographic, and anthropometric factors could be the reasons why the findings of the present study depart from some other studies.

In the present study, the effect of age on the parameters measured was noticed. In the majority of parameters, there was significant incremental growth from the age of newborn through the young adulthood age. This may be due to incremental growth form of the upper and lower jaws as the individual gets older. The eruption of teeth from primary to permanent dentitions leading ultimately to the formation of the full complement of the adult dentition could be another reason for this age changes, as this may impact or have an adapting or corresponding growth effect on the dimensions of the lip. The mean Cupid's bow width and lower vermilion height were not significantly greater in teenage than young age, indicating that they stopped growing at young adult age. In a related study in an Indian population, it was reported that mean Cupid's bow width and commissure width increased from neonates, 1 year, 12 years through adult age [3]. Also, in a photographic study of the lip in Fans family in Mashhad, it was observed that mouth width and philtrum width (Cupid's bow width) increased from age 4 years to adult [7]. The varied observations among different studies may be due to genetic, geographic and nutritional factors that may impact on the growth and maturity of biological structures.

Limitation of the study

This study considered only the linear dimensions of the lips as it concerns age changes and gender. It is suggested that studies which will take into consideration lip indices of the various dimensions be conducted to address this limitation.

Conclusion

In all parameters measured, males are statistically

significantly greater than females, except philtrum height in newborns, length of 1 limb of vermilion length in pre-school age group, lower vermilion and philtrum heights in school age group, upper vermilion height and length from the tip of cupid's bow to commissure in teenage group, and upper vermilion height and lower vermilion height in young adult age group. There is a significant incremental growth of mean parameters measured from newborn age through young adult age, except cupids bow width between young adult and teenage group; lower vermilion height between young adult and teenage group, philtrum height between teen and school age, as well as between the young adult and teenage group.

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Prevalence of Hyperprolactinaemia and Its Correlation with Raised Thyroid Stimulating Hormone (TSH) Levels among Infertile Women in Calabar, South-South Nigeria

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ABSTRACT

Background: Hypothalamic- pituitary dysfunction due to hyperprolactinaemia is one of the leading causes of anovulatory infertility. The purpose of this study was to determine the contribution of hyperprolactinaemia to female infertility in Calabar and also assess its association with hypothyroidism and possible influence of socio-demographic factors..

Methods: Prolactin levels of 152 women attending infertility clinics in Calabar were assessed. Equal number of fertile subjects with similar age and socio-economic status were recruited from the family planning clinics and enrolled as controls. Semi structured questionnaire were used to obtain socio demographic and medical information. Serum prolactin measurement was performed using a commercially available immunoassay kit. Thyroid stimulating hormone (TSH) assay was performed on samples with raised prolactin concentrations. Data were collected and analyzed using SPSS version 16.

Results: The prevalence of hyperprolactinaemia among the infertile women was 37.5% compared to 4.6% prevalence in the fertile group (p<0.001). Only 3.5% of hyperprolactinaemic infertile women had raised serum TSH levels. Infertile women with hyperprolactinemia were more likely to have abnormal menstrual pattern and oligomenorrhoea was the commonest complaint (p= 0.017). Galactorrhoea was present in 57.8 % of hyperprolactinemic patients. Parity, body mass index (BMI) and social class did not significantly influence prolactin excess (p>0.05).

Conclusion: The prevalence of hyperprolactinaemia was significantly high in infertile women. Hence, assessment of serum prolactin levels should be included in the initial work-up of all women presenting with infertility. However, this study does not support routine TSH assay in this group of women.

Key words: *Infertility, serum prolactin, hyperprolactinaemia, galactorrhoea,, hypothyroidism, oligomenorrhoea.*

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INTRODUCTION

Infertility is a worldwide problem occurring in about one in ten couples which leads to increasing number of them seeking specialist fertility care[1,2]. Compared to other parts of the world, several countries in sub-Saharan Africa have high prevalence rates of infertility[3].In some parts of Nigeria, community-based studies have reported rates of infertility as high as 20% to 45%.[3,4] It accounted for nearly 40% of all gynaecological consultations in Maiduguri, north-east Nigeria.[5] Infertility is one of the commonest problems seen in gynaecological clinics in Calabar[6]. Hyperprolactinaemia (raised serum prolactin level) is a leading cause of anovulatory infertility in Africa[4]. Elevated serum prolactin concentration is associated with failure of ovulation.[7] Women with hyperprolactinaemia typically present with a history of oligomenorrhoea, amenorrhoea, or infertility, which generally result from suppression of gonadotrophin releasing hormone (GnRH) by abnormally raised prolactin levels[7,8]. The physical findings most commonly encountered in adult female patients with hyperprolactinaemia include galactorrhoea and occasionally, visual field

defects[7]. Typically, the diagnosis of hyperprolactinaemia is made via the aid of laboratory studies. Normal fasting serum prolactin values are generally less than 25ng/ml irrespective of the differences in the reference intervals established by different clinical laboratories.[7]

The causes of hyperprolactinaemia fall into three main categories: physiological, pharmacological, and pathological factors. Pathological hyperprolactinaemiais are due to hypothalamic-pituitary lesions and secondary causes such as primary hypothyroidism, chronic renal disease or adrenal insufficiency[8,9]. Pharmacological causes of hyperprolactinaemia include: dopamine receptor antagonists (phenothiazines, butyrophenones, thioxanthines, metoclopramide) and dopamine depleting-agents (methyldopa and reserpine).[7,9] Prolactin secretion from the anterior pituitary gland is pulsatile and increased during pregnancy, reaching a peak at the time of parturition.[9] After delivery, the plasma concentration falls to non-pregnant levels within 2 weeks, except in lactating women.[10]

Traditionally, measurements of prolactin and thyroid stimulating hormone (TSH) have been considered important components of biochemical evaluation of women presenting with infertility[11]. Several studies have shown the relationship between subclinical hypothyroidism, hyperprolactinemia and infertility.[12-14]

Primary hypothyroidism is associated with increased production of thyrotropin releasing hormone (TRH), which is known to stimulate a pituitary TSH and prolactin release. Also, thyroid hypofunction has been implicated in a broad-spectrum of reproductive disorders, ranging from abnormal sexual development to menstrual irregularities and infertility.[12,15-17]

This study therefore, set to determine the prevalence of hyperprolactinaemia and what proportion of this is associated with subclinical hypothyroidism among women attending infertility clinics in Calabar. Additionally, the study attempts to evaluate possible relationship of raised prolactin and infertility with some socio demographic characteristics of the participants.

Subjects and Methods

This was a cross-sectional comparative study conducted among 152 infertile female patients recruited from the University of Calabar Teaching Hospital (UCTH) and two specialist private infertility clinics, Mevom and Victoria Itam specialist clinics, in Calabar metropolis from January to June 2014. Women with infertility were enrolled during the initial consultation at the clinics during the study period. A semi-structured questionnaire with closed-response questions was used. A detailed history was obtained and physical examination was carried out depending on the complaint. The weight and height were measured and body mass index calculated (Kg/m^2).

The breasts were examined for galactorrhoea in the presence of a female chaperon after a written informed consent. In order to determine the prevalence of hyperprolactinaemia in the fertile population, controls were developed by recruiting 152 age-matched fertile women at family planning clinics who were not on hormonal contraception (those using barrier methods and intra-uterine contraceptive device). Women who were on drugs known to affect prolactin secretion, pregnant women, and lactating mothers were excluded from the study. The participants were counseled that sample must be collected in the morning and to avoid sexual intercourse or fondling with breasts a night before sample collection. Fasting serum samples were obtained in the morning. Blood samples were obtained using standard venopuncture technique.

Laboratory Analysis

Serum prolactin was determined by a commercially available quantitative enzyme-linked immunosorbent assay (ELISA) for human prolactin (Diagnostic automation Inc. 23961 Craftsman Rd Suite E/F, Calabarsas Califonia 91302 USA).The normal upper reference limit used in the Chemical Pathology laboratory of

UCTH is 20.1ng/ml. The range is 0.5 to 20.1ng/ml. Serum TSH level was assayed for women with prolactin levels above the upper limit. The level of TSH considered normal is 0.5 to 4.1mIU/L. Women with serum prolactin levels above 100ng/ml were advised for skull x-ray (coned down view), computed tomographic(CT) scan or magnetic resonance imaging (MRl) to rule out prolactin-secreting tumours. Data obtained was analyzed with statistical package for social sciences (SPSS) version 16 (SPSS Inc. Chicago, Illinois – USA). Numerical variables were expressed as mean +/- standard deviation. Test of statistical significance were computed using the student t-test for numerical variables and the Chi-square test (x^2-test) for categorical variables. A p-value of <0.05 was considered statistically significant.

Results

The mean age in years of women in the infertile group was 30.7 $\pm$1.4 and that of the control was 29.7$\pm$1.3. Secondary infertility was found in 118 women (77.6%) and primary infertility occurred in only 34 women (22.4%) in the study group. Hyperprolactinaemia was found in 57 (37.5%) infertile women compared to only 7 (4.6%) in the

Table 1: Prevalence of Hyperprolactinemia (20.1ng/mi and above) in both groups

Prolactin levels(ng/ml)	Study group n = 152		Control group n= 133	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
< 20.1	95	62.5	127	95.5
≥20.1	57	37.5	6	4.5
Total	152	100	133	100

Table 2: The prevalence of Hyperprolactinemia in primary and secondary infertility

	Prolactin levels		
Type of infertility	Normal level	Excess prolactin level	Total
Primary	19(55.9%)	15(44.1%)	34
Secondary	76(64.4%)	42(35.6%)	118

P value = 0.384

Table 3: The range of Serum prolactin levels among the participants

Serum prolactin level (ng/ml)	Primary infertility n=34	Percentage (%)	Secondary infertility n=118	Percentage	p-value
0-20.1 (normal)	19	55.9	76	64.4	0.0365
20.2-50^0 (mild)	9	26.5	30	25.4	0.9017
50.1-99.9 (moderate)	5	14.7	10	8.5	0.02823
100 and above (marked)	1	2.9	2	1.7	0.644

Table 4: Comparison of Hyperprolactinemia and galactorrhoea in secondary and primary infertility groups

	Primary n = 34	Secondary n = 118	p-value
Hyperprolactinemia	15 (44.1%)	42 (35.6%)	0.3653
Galactorrhoea	8 (23.5%)	37 (31.4%)	0.3782

Table 5: Association between Hyperprolactinemia and Menstrual Disorders

Menstrual disorder	Prolactin group		p-value
	Normal level	Hyperprolactinemia	
Regular	50 (52.6%)	21 (36.8%)	0.059
Oligomenorrhoea	17 (17.9%)	20 (35.1%)	0.017
Amenorrhoea	21 (22.1%)	11 (19.3%)	0.6818
Others	7 (7.4%)	5 (8.8%)	0.7571
Total	95	57	

Table 6: Body mass index of both groups

Body mass index (MMBI)	Study group n = 152		Control group n = 152		p-value
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
≤ 19.9	2	1.3	5	3.3	0.3297
20-24.9	46	30.3	59	38.8	0.0704
25-29.9	70	46.1	65	42.7	0.4973
30-34.9	28	18.4	15	9.9	0.0358
≥ 35	6	3.9	8	5.3	0.8015
Total	152	100	152	100	

Table 7: BMI and Hyperprolactinemia among the respondents

BMI	Control group	Study group	p-value
≤19.9	-	1 (1.8%)	-
20-24.9	2 (33.3%)	19 (33.3%)	-
25-29.9	1 (16.7%)	25 (43.9%)	0.1981
20-34.9	2 (22.3%)	11 (19.3%)	0.4202
≥35	2 (16.7%)	1 (1.8%)	0.0492

controls giving a very high prevalence of hyperprolactinaemia among the infertile women, as shown in table 1

The serum prolactin level ranged from 1.1ng/ml to 325.0ng/ml among the infertile women, and the median prolactin level was 15.8ng/ml. That of the control group ranged from 0.5 to 47.9 ng/ml, giving a mean prolactin level of 7.2$\pm$7.8ng/ml and a median of 4.4ng/ml. Out of the 34 women with primary infertility, 15 (44.1%) of them had hyperprolactinaemia whereas 42 (35.6%) of the 118 women with secondary infertility had hyperprolactinaemia (Table 2). However, the difference was not statistically significant (p = 0.384). In assessing the degree of hyperprolactinaemia based on the serum prolactin levels[15], (Table 3), 39 out of the 57 hyperprolactinaemia women had mild prolactin excess, that is, serum level of 20.2 to 50.0ng/ml;15 of them had moderate prolactin excess (50.1 to 99.9ng/ml) and 3 had marked prolactin elevation, (.>100.0ng/ml).

Galactorrhoea was present in 45 (29.6%) of the total women in the infertile group compared to 5 (3.3%) in the controls. As shown in table 4, secondary infertile women were more likely than the primary infertile subjects to have galactorrhoea (31.4% vs 23.8%) although the difference was not statistically significant (p > 0.05) The incidence of galactorrhoea in hyperprolactinemic patients was 57.8%. (31 out of 57). Hyperprolactinemia was significantly more likely to be associated with menstrual irregularities and infertile women were more likely than the women in the control to have menstrual irregularities. Table 5 shows that oligomenorrhoea was the commonest menstrual disorder among the hyperpro-lactinemic group and there was a significant positive association between excess prolactin and oligomenorrhoea-(p=0.0170. Only 36.8% of the Hyperprolac-tinemic patients had regular

menstruation.

The social classes of the respondents in both groups were determined using a classification based on the highest level of educational attainment of the woman and the occupation of her spouse[18]. Infertile women in the high social class (1 & 2) were more likely than the controls to be hyperprolactinemic although the difference was not statistically significant (p= 0.3186). Almost one third of the infertile women (65.3%) were nulliparous and only 7 (4.6%) of them have had up to 4 children. In contrast about one fifth (18.4%) of the controls were of high parity (para 4 and above). The body mass index (BMI) in the infertile group range from 19.3Kg/m^2 to 38.5Kg/m^2 and the mean BMI was 27.19Kg/m^2 compared to the mean BMI of 25.84Kg/m^2 in the control (range 18.9 to 39.3). Table 6 shows that the infertile women were more likely than the controls to be obese (BMI of 30Kg/m^2 or more) but this was not statistically significant (p>0.05). Also there was no significant association between obesity and hyperprolactinemia (p=0.4202) as shown in table 7.

Only two women with hyperprolactinaemia in this study had TSH level above normal (0.5 – 4.1mIU/L) giving a very poor correlation with hyperprolactinaemia and a 3.5% prevalence of hypothyroidism among hyperprolactinaemic infertile women. There was no raised TSH value among the 7 hyperprolactinemic fertile controls. However, higher values of normal TSH concentration were observed among oligomenorrheic women. The mean TSH level in this group was 2.5$\pm$2.4mIU/L compared to the mean serum TSH level of 1.3$\pm$0.8mIU/L in women with normal menstrual pattern (p =0.3618).

Discussion

Hyperprolactinaemia is a common endocrine disorder encountered among women with infertility in Calabar. The prevalence of

hyperprolactinaemia among infertile women in this study is 37.5% which is slightly higher than 31.7% prevalence reported in a northern Nigerian tertiary hospital by Idrisa et al[1]. Also, in a study that evaluated 111 infertile women in India, Kumkum et al[17] reported a higher prevalence of 46% and a much higher prevalence of 61% was also reported by Eftekhan et al,[19] among 100 infertile women with abnormal uterine bleeding. The prevalence of 4.6% among the fertile controls in this study is similar to 5% prevalence reported among family planning clients in a Japanese study[20] but much lower than 15% prevalence in an unselected population in Asia reported by Goswami et al[21].

This high prevalence in the infertile women emphasizes the potential impact of hyperprolactinaemia on the reproductive profile of the women in the study group. In this study, there were 34 (22.4%) women with primary infertility and 118 (77.6%) women with secondary infertility giving the ratio of primary to secondary infertility of about 1:4 comparable to the ratio of 1:3 (31.7% primary and 68.3% secondary) documented by Idrisa et al[1] in northern Nigeria. This is in contrast to what is obtained in some studies outside sub-Saharan Africa. For instance, in a study assessing the prevalence of hyperprolactinaemia among infertile women in India by Kumkum et al[17], 60% of the women had primary infertility and 40% had secondary infertility. This significant difference may not be unrelated to the etiological factors that are peculiar to sub-Saharan African countries like infection from unsafe abortion or puerperal sepsis which may be the major contributing factors to secondary infertility.

In this study, the serum concentration of prolactin among the infertile group ranged from 1.1 to 325.0ng/ml with a median concentration of 15.8ng/ml whereas Mishera et al[17] and Kumkum et al[17] reported mean prolactin concentration of 128.28$\pm$12.74ng/ml and 76.33$\pm$55.97ng/ml respectively among infertile women. This wide variation may be due to methodological differences between the immunoassay kits used in different laboratories and also the disparity in the demographic characteristics of the subjects in these studies.

Also, the study revealed that women with primary infertility (44.1%) were more likely to be hyperprolactinemic compared to those with secondary infertility, though the difference was not statistically significant (p = 0.384). Similar findings were obtained by Idrisa et al[1] in northern Nigeria. The reason for this difference may not be unrelated to other major contributing factors to female infertility other than anovulation. Although this research did not check for utero - tubal factors among the women, it is possible that women who had been pregnant before might have been exposed to unsafe abortion or unsafe delivery with risk of tubal or endometrial damage causing secondary infertility.

The study shows that less than two third (57.8%) of hyperprolactinaemiic women presented with galactorrhoea. This was far less than the incidence of 90% reported by Kumkum et al.[17] This implies that a significant percentage of our galactorrheic women are not necessarily hyperprolactinaemic, thus, it may not be cost effective to routinely prescribe dopaminergic agonists like bromocriptine for women with symptomatic galactorrhoea without measuring the serum levels of prolactin because about 4 out of 10 of such women may not benefit from such presumptive treatment. In this study galactorrhoea was more among women with secondary infertility. During pregnancy, the placenta produces large amount of estrogen. After termination of pregnancy galactorrhoea may develop following estrogen withdrawal because of the absence of inhibitory effect on prolactin action at the breast.[22]

It is also pertinent to note that the clinical impact of hyperprolactinaemia may not be as straightforward as it is with other hormones. Both intra-individual and interpersonal variations can occur in secretion pattern of prolactin among patients. Also, the occurrence of different molecular forms, of prolactin may explain the varying physiological effects[10]. This may also be the reason for poor correlation between the degree of prolactin excess and the occurrence of symptoms like galactorrhoea and menstrual disorders.

The study showed a weak correlation between hyperprolactinemic infertility and social class, parity and obesity. One of the more obvious reasons class matters is the ability to afford medical treatment for infertility. Also poor women have higher rates of infertility, due to class- specific trends such as higher prevalence of sexually transmitted diseases.[23] Furthermore, low social class and maladaptive strategies might contribute to infertility related stress and anxiety which may influence prolactin secretion.[24] Higher class women are more likely to receive significant support from their partners. Previous studies have shown association between prolactin levels and prevalence of obesity.[25,26] This may be related to hyperinsulinemia which alters prolactin secretion.[26] Weight reduction with accompanying decrease in plasma insulin has been shown to lead to normalization of prolactin responses.[27]

Contrary to the view by Klufio [27], that all cases of hyperprolactinaemia should be tested for hypothyroidism, in this study, hypothyroidism (raised TSH) was relatively rare. The ratio of hypothyroidism to hyperprolactinaemia of 1: 29 in this study is far less than a ratio of 1:4 reported by Kumkum et al.[17] In a cross-sectional study by Goswami et al[21] the prevalence of hypothyroidism was slightly higher in the infertile women in comparison with the general population and there was a positive correlation between serum TSH and prolactin levels in the infertile subjects. It was concluded that there was a greater propensity for thyroid disorders in infertile women than the fertile ones. Raber et al[28] also studied the routine thyroid function tests in infertile women and reported that the low incidence of hypothyroidism in pregnant patients was related to the association between infertility and hypothyroidism.

The wide variations in reported association of hypothyroidism with hyperprolactinaemia may be due to differences in environmental factors, such as diet and geographical location. The increased consumption of sea foods, rich in iodine, by most inhabitants of Calabar, a riverine area, may have accounted for low prevalence of thyroid disorders as sea foods are very rich in iodine[29,30].

In conclusion, the prevalence of hyperprolactinaemia is high among infertile women in Calabar and prolactin assay should be included as a first line hormonal screening in the infertility clinics. The prevalence of hypothyroidism in infertile women with hyperprolactinaemia in this study is relatively very low (3.5%). This finding does not support the inclusion of routine thyroid function assessment as one of the first line hormonal work-up in infertility clinics.

Limitation
This study relied in part on information obtained with a pre-coded questionnaire and history obtained from the patients. Some important facts might not have been volunteered by the study subjects. Notwithstanding, valuable information concerning the role of hyperprolactinaemia in the aetiopathogenesis of female infertility among women in Calabar has been established.

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Molecular Identification of Escherichia Coli and Staphylococcus Aureus Associated Non-gonococcal Urethritis from Clinical Samples.

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ABSTRACT

Background: Molecular identification of microbial agents involves the detection of the infecting organism's deoxyribonucleic acid (DNA) or ribonucleic acid (RNA). The detection of RNA or DNA of the organism can be done after isolation and cultural identification or can be done directly from the clinical sample provided. In some cases, molecular identification is used to confirm cultural identification.

Materials and methods

The main purpose of this study was to identify and confirm *Escherichia coli* and *Staphylococcus aureus* associated non gonococcal urethritis from culture previously identified by phenotypic characteristicsusing molecular method. 12 (28.6%) *E. coli*of total population and 12(46.1%) of total population of *S. aureus* previously identified by conventional method were subjected to Polymerase Chain reaction. The *nuc* and 16SrRNA were synthesized for *S. aureus* while *UidA*,*PhoE* and *Tuf*genes were synthesized for *E. coli*.

Results

Results showed that the 16SrRNA primer aligned with the *S. aureus* strains tested. The *UidA* gene aligned with all *E. coli* strains tested against the other primers. *UidA* gene is an identification marker for *E.coli* since 97% of *E. coli*produce this enzyme, *E. coli* isolated from clinical samples and those isolated from environment can be detected.

Conclusion

It can therefore be concluded that molecular identification tallied with cultural and biochemical methods.

Keywords: *Molecular identification, E. Coli, S. Aureus, Non-gonococcal, Urethritis, Abraka, Nigeria.*

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INTRODUCTION

Identification of microorganisms that cause diseases is important for effective antimicrobial and supportive therapy[1]. Microbial identification is also important in understanding disease development. Microbial Identification may be done in two ways : investigation of observable traits resulting from gene expression; and investigation of the traits encoded within its genome[2]. Colony morphology depends on the characterization of the phenotypic traits exhibited by a group of microorganisms-colonies and involves plating clinical samples on solid growth medium and observed to the naked eye the colonies formed by those bacteria[3]. Molecular identification of infective agents involves the detection of the infecting organism's DNA or RNA in a patients'tissue or body sample. The detection of RNA or DNA of the infective organisms can be done after isolation and cultural identification or directly from the clinical sample provided. Polymerase chain reaction (PCR) as a molecular means of identification of microorganism is highly sensitive and specific; and is therefore used for characterization, detection, diagnosis, and taxonomy of infective disease agents[4]. Polymerase chain reaction can

also be used to confirm cultural identification of the infecting agents. Accurate diagnosis is the first step in making the right treatment choices. In infective diseases, the right choice of chemotherapeutic agents will reduce the likelihood of emergence of resistance strains, lower cost of disease management, and ultimately reduces morbidity and mortality.

Escherichia coli belongs to the family Enterobacteriaceae. It is the most common gram negative organism isolated in clinical laboratories.[5,6] It is the commonest cause of urinary tract infection (UTI) and a common cause of both intestinal and extra intestinal infection[7]. *E.coli* causes a wide range of UTIs, including uncomplicated urethritis/cystitis, symptomatic cystitis, pyelonephritis, acute prostatis, prostatic abscess, and urosepsis. Uncomplicated cystitis occurs primarily in females who are sexually active and are colonized by auropathogenic strain of *E coli*. Subsequently, the periurethral region is colonized from contamination of the colon, and the organism reaches the bladder during sexual intercourse[8].

Members of the genus *Staphylococcus* are Gram-positive cocci, that occur as grape like, non-motile, non-spore forming and catalase positive, bacteria. Members of this genus have a DNA with G+C content of 30-39 mol%, and the genus is currently composed of 32 species [9].*Staphylococcus* species cause a variety of infections, and is well recorded as a human opportunistic pathogen.

Urethritis affects all age group especially those under 35 years who have had a recent partner change. Men who have sex with men and those who have unprotected vaginal intercourse are at higher risk. Children, especially sexually abused children are also at risk of urethritis[10-11] mentioned that urethritis occur as urethral syndrome in children. These include dysfunctional voiding, bulbar urethritis (common urologic problem in adolescent boys that is associated with dysuria, meatal blood spotting and microscopic hematuria) and urethral strictures.

The main purpose of this study is to establish the molecular identification of two organisms that are known to be the causative agents of urethritis

Materials and Methods

Two organisms previously isolated and identified by cultural and biochemical methods from urine and urethral samples of patient with clinical urethritis were subjected to molecular identification. *Escherichia coli* and *Staphylococcus aureus* were cultured on selective media including MacConkey agar and Mannitol salt agar according to method described by Cheesebrough,2004[12]. Thereafter, the DNA of the organisms were extracted, DNA mastermix were constituted, electrophoeresis and visualization of amplified products was done after Polymerase chain reaction was carried out.

Polymerase Chain Reaction (PCR) for the identification of clinical isolates.
DNA Extraction

DNA of the organisms were extracted using Qiagen DNA purification kit. Both *E. coli* and *S.aureus* cultures were revived by streaking on nutrient agar (Oxoid) and incubated for 24hours at 37°C. Pellets of *S.aureus* were harvested and suspended in 180μl of buffer ATL (lysis buffer) containing 200ng/ml lysostaphin; in 20mM TrisHCl 2mM EDTA, 1.2% Triton, and incubated at 37°C for 30 minutes before protienase K treatment. *E .coli* was also harvested and resuspended in 180l of buffer ATL before proteinase K treatment. The mixture was then vortexed and incubated at 56°C for 3 hours, with occasional voltexing in between. The tube was briefly centrifuged to remove drops from side of the tube. Two hundred microlitre (200 l) of ethanol (96-100%) was added to sample mix by vortexing. The tube was briefly centrifuged to remove drops from side of the tube. The 200l of buffer A1 was added, pulse-vortexed for 15 seconds and incubated at 70°C for 10 minutes and briefly centrifuged.

The spin column (supernatant) was transferred into a 2 ml collection tube and centrifuged at 8000 RPM for 1 minute. To this, 500l of buffer AW1 was added and centrifuged at 8000RPM for 1 minute. The spin column was

then transferred to another clean 2ml collection tube to which 500l of buffer AW2 was added and centrifuged at 14,000 RPM for 3 minutes. The spin column was similarly pipetted into a fresh 2ml collection tube and finally centrifuged at 8000 RPM for 1 minute thereafter 200l of buffer AE was added. The product constituted the extracted double stranded DNA of the isolates. This was kept in -20°C until needed.

The PCR Master Mix

Twenty microliter of forward and reverse primers were added into Eppendolf tube and kept in ice. The primers used in this study are shown in Tables 2 and 3. Fifteen microliter of DNA polymerase, 5μl of Deoxyribonucleic acid triphosphate (DNTPS) and 20l of buffer 2B (Sodium acetate and acetic acid) were added to the mixture above. The mixture was vortexed for 1 minute, 10l of co-factor (Magnesium Chloride) was added to the mixture. This constituted the DNA master mix.

The Polymerase Chain Reaction

The extracted DNA from each isolate was pipetted in 10ml amounts into tube and 10ml of the master mix was added to each and vortexed to ensure thorough mixing of the components and then briefly centrifuged. The tubes were immediately loaded into the PCR Madime (M) (Research PTC 200 Pelteir Thermal Cycler-

Biodirects, US) which was programmed with the following conditions : initial denaturation at 94°C for 5 minutes then 40 cycles of denaturation at 94°C for 30 seconds, primer annealing 55°C for 30 seconds, primer extension at 72°C for 1 minute for *S. aureus,* while the PCR conditions for *E. coli* included: initial denaturation at 94°C for 3 minutes, denaturation at 94°C for 30 seconds, primer annealing was at 60°C for E, 58°C for C and D, 61°C for G for 30 seconds. Primer extension was at 72°C for 60 seconds. Denaturation, Primer annealing and Primer extension was repeated for an additional 29 times. Final primer extension was at 72°C for 5 minutes. Products were then stored before electrophoresis.

Electrophoresis and Visualization of Gel

Aliquots of 15l each of the DNA amplification products and DNA molecular size marker (Ladder or Standard (100 – 1500bp) were loaded into the 2% agarose gel electrophoresis and visualized under UV transillumination

Results
Bacterial obtained from cases of Urethritis.

Table 1 shows cultural characteristics of *Escherichia coli* and *Staphylococcus aureus* on selective culture media and gram staining. It is worthy to know that colony morphology complements staining and biochemical characterization in microbial identification.

Table 1: Gram Staining and Culture Characteristics

Parameters	E. coli	S. aureus
Media	MacConkey Agar	Mannitol Salt Agar
Gram stain	Negative short rods	Positive cocci in clusters
Culture characteristics	Flat, dry, pink colonies surrounded by a zone of precipitated bile.	Yellow colonies with yellow halo colonies

Identification Using Molecular Method

Molecular techniques such as PCR have been extensively used for identification and characterisation of pathogens from clinical specimens . Primer sets E, F, G, C, D, A and B were synthesized and used for E coli and *S. aureus* as shown in Table 2.

Table 2: The chosen E. coli and Staphylococcus Aureus specific PCR primers

Assay	Genetic	Primer	Sequence	Source Target
E	uidA	URL-301	5'-TGTTACGTCCTGTAGAAAGCCC-3'	Bej et al., 1991a
		URR-432	5'-AAAACTGCCTGGCACAGCAATT-3'	
F	uidA	UAL754	5'-AAAACGGCAAGAAAAAGCAG-3'	Bej*et al.*, 1991
		UAR900	5'-ACGCGTGGTTACAGTCTTGCG-3'	
G	uidA	UAL1939	5'-TATGGAATTTCGCCCGATTTT-3'	Bej*et al.*, 1991
		UAR2105	5'-TGTTTGCCTCCCTGCTGCGG-3'	
C	phoE	EC5	5'-AAAGCCGTGGCACAGGCAAGCGT-3'	Spierings*et al.*, 1993
		EC8c	5'-TCAATTTGTTATCGCTATCCAGTTGG-3'	
D		TEcol553	5'-TGGGAAGCGAAAATCCTG -3	This study
		TEcol754	5'-CAGTACAGGTAGACTTCTG-3'	
Staphylococcus aureus.				
A	nuc-1:		5'-TCAGCAAATGCATCACAAACAG-3'	DTU Food,2009
	nuc-2:		5'-CGTAAATGCACTTGCTTCAGG-3'	
B	16S-1:		5'-GTGCCAGCAGCCGCGGTAA-3'	DTU Food,2009
	16S-2:		5'-AGACCCGGGAACGTATTCAC-3'	

Twelve *E. coli* strains were selected randomly from previously cultural and biochemically identified organisms. The twelve strains were tested against the five primers, however, only primer set E was specific for *E. coli* strains tested. The other primer sets did not align to the strains and thus no amplification products obtained.

Specificity is the ability of Primers synthesized to target only desired species. Out of the 5 primer sets used against tested bacterial strains, only Primer E targeting,

UidA was 100% specific to *E. coli.* The primer sets F, G, C and D which targeted the *UidA, phoE* and *tuf* genes did not amplify the DNA from the tested strains of *E. coli* in this study.

The specificity of the 12 *E. coli* specific PCR primer sets were verified by testing 12 non-*E. coli* strains including gram negative and gram-positive organisms.

The primer set used against *Staphylococcuaureus* strains are indicated in Table 2. The organism tested positive for

primer 16SrRNA. The nuc 1 & 2 primer set was able to align some strains of *S. aureus* tested (Agar gel electrophoresis not shown).

Agar gel electrophoresis was used to confirm the product as identical to a sequence of the *S. aureus* 16SrRNA gene

Figure 1a. Gel electrophoresis of PCR products amplified for strains 1 to 6 of *E. coli*
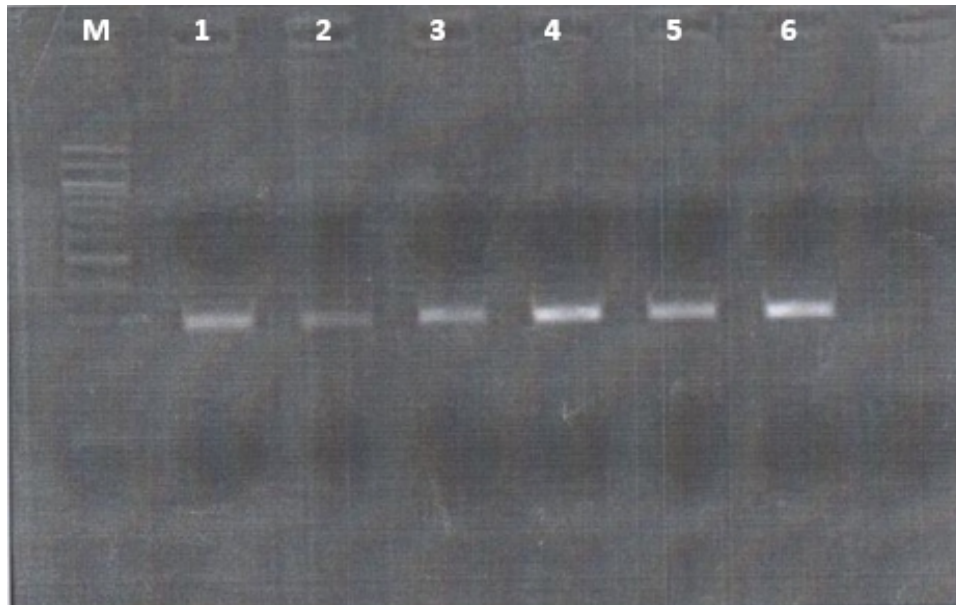
Figure 1b. Gel electrophoresis of PCR products amplified for strains 7 to 12 of *E. coli*
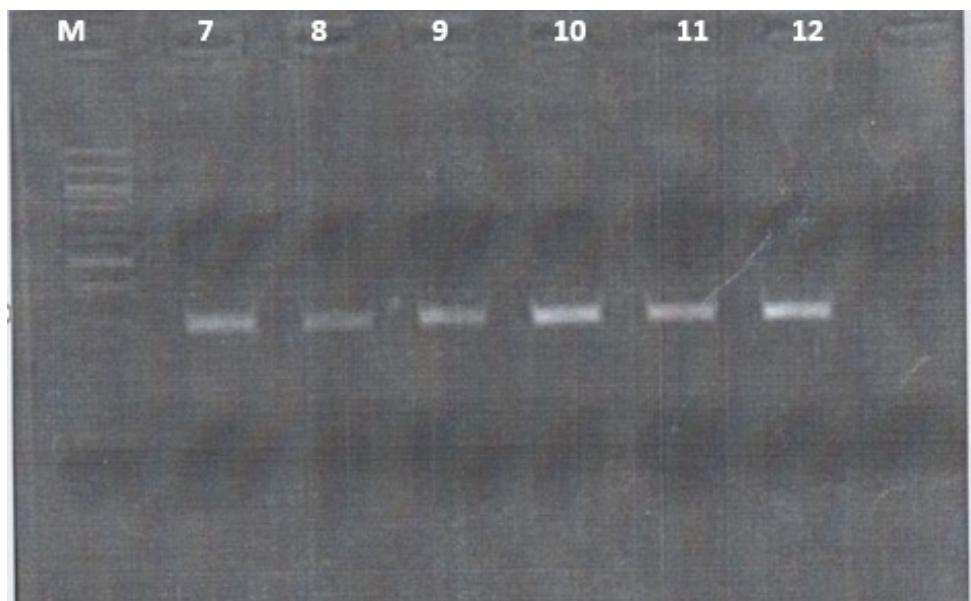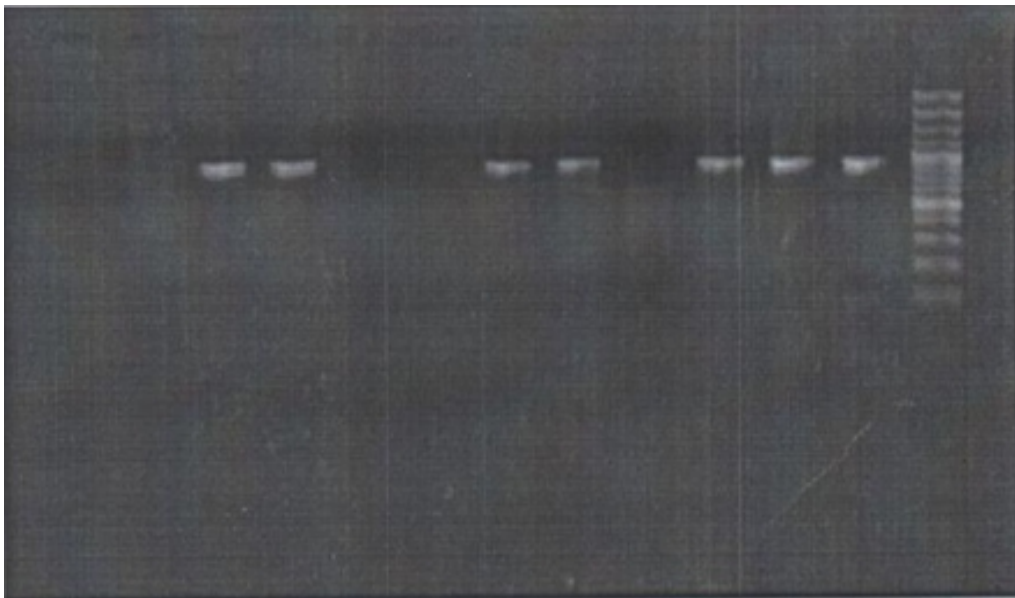
Figure 2a. Gel electrophoresis of PCR products for *Staphylococcus aureus* **strains**

Figure 2b. Gel electrophoresis of PCR products for *Staphylococcus aureus* **strains**

Discussion

Nucleic acid amplification by PCR has application in many fields of biology and medicine. In this study, oligonucleotide primer sets A and B were synthesized for *Staphylococcus aureus*species. Primer A set recognised sequence of the *S. aureusnuc* gene, which encodes for a *S. aureus –* specific thermonuclease[13]. The extra-cellular thermostable nuclease (TNase) is usually produced with a frequency similar to that at which *S. aureus* produce coagulase[14].

The other primer set B was *S. aureus* 16srRNA which is highly conserved within a species and among species of the same genus[15]. *Staphylococcus aureus* specific genes include *Coa, gyrA, hol B, femA, femB* and the *nuc*gene[13] of these, the *nuc*gene was used in addition to 16srRNA for this study however, the primer set that targeted the *nuc* gene was not as sensitive as the primer set that targeted the 16srRNA. This report is in line with earlier studies which stated that *nuc* gene is not specific for *S. aureus*[16-17]. In the agarose gel electrophoresis, *nuc* generated 255bp, while 16srRNA generated 586bp. All strains of *S. aureus* studied yielded amplification products with the 16srRNA primer while few strains yielded primer products for nuc gene photomicrograph not shown.The *Escherichia coli* strains were tested with primer sets E, F, G, C, D as shown in Table 2.

Twelve strains obtained from urine andurethral were used against the five primer, however, only primer set E was specific for the *E. coli* strains tested. The other primer sets did not align to the strains and no amplification product obtained. Primer sets E targeting *UidA*gene were 100% specific for *E.coli*

since they did not amplify DNA from any of the 12 non *E.coli* strain strain tested.

The primer sets C and D which targeted *PhoE*and *Tuf* gene did not amplify the DNA from the tested strain of *E.coli* in this study. Tuf is chromosomal gene encoding for elongation factor (EF-Tu)[18] While PhoE is the outer membrane protein of the family Enterobacteriaceae consists of conserved membrane spanning segment and hypervariable surface exposed regions[19]. The primer set that aligned to the *Escherichia coli* strains located in this study was of the gene *UidA*. The *UidA* gene encodes for the β- glucuronidase enzymes as the gene is unique and conserved in *Escherichia coli* and *Shigella*spp[20-22].

About 97% of *E . coli* produce this enzyme[22,23]. The ability of *E. coli* strains studied to align with *UidA* primer indicates that the strains were actually *E. coli*. In this study, however, the*phoE* did not align with any of the *E.coli* strain thus contrasting previous reports where *E.coli* strains were recognized by the primer[20].Previous reports show that *UidA*gene has been used by researcher to characterize *E. coli* from clinical specimens[22,24]. The *UidA*primer used by them successfully amplified all the *E. coli* strains they isolated from urine thus confirming the fact that *UidA* is an identification marker for *Escherichia coli*[22,23,24,25].

Also, the *UidA* gene has also been used to detect *E. coli* from environmental samples[21,26]. Primers F and G did not align with the strains though the target was *UidA* gene thus contrasting the report of Maheux[25], primer sets C, D, F, G which amplified all the *E.coli* strain studied by them. In this study however, none of these primers were positive for the *E.coli* strains. The reason may be due to difference in

primer sequence.

Conclusion

Escherichia coli and Staphylococcus aureus were confirmed using PCR. Five primers (E, F, G, C and D) targeting *UidA, PhoE* and *Tuf* genes of *E. coli* were synthesized for the study while two primer sets (A and B) targeting *nuc* gene and 16SrRNA gene were synthesized for *S. aureus* isolates. Only primer set E targeting the UidA genes were specific for *E. coli* and 16SrRNA genes was specific for *S. aureus* isolated in this study.

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Oral Health Status and Treatment Needs of Pregnant Women Receiving Ante-Natal Care in Central Hospital, Warri.

Anibor E; Etetafia M

ABSTRACT

Objective

This study was done to determine the oral health status and treatment needs of pregnant women at the Central hospital in Warri, Nigeria.

Materials and Method: This was a descriptive cross-sectional survey which involved self-reported questionnaires and oral examination. 542 pregnant participants at a gestational age of 24 weeks and above and aged 14-50 years were selected using the cluster sampling technique. Oral, non-invasive examinations were performed in a well-lit room using additional artificial light by the dentist with participants seated on a chair using a mouth mirror and a periodontal probe.Other instruments used include the sharp probes used for the diagnosis of dental caries. The clinical parameters noted include oral hygiene status, gingival bleeding on probing (presence or absence) and calculus (presence or absence). The data was analyzed using SPSS version 18.0 package.

Results: The mean age of the study sample is 29.5 years. The prevalence of dental caries was 22.5%. Gingival bleeding was observed in 26.7% and calculus in 86.5%. Findings also revealed that 48 (22.5%) of the pregnant women required amalgam fillings, 56 (26.3%) required extraction due to caries and 56 (26.7%) required scaling, polishing and oral hygiene instructions. The majority of the subjects (63.5%) had fair oral hygiene, even though 88.2% had gingivitis.

Conclusion: The oral health statuses of these pregnant women were fair even though many had numerous treatment needs. Dental education and periodic oral examination should be part of antenatal programs. Pregnancy has a definite impact on the oral health status. More researches are needed to determine the extent of impact.

Keywords: *Oral health status, pregnancy, dental complaints, gingivitis .*

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INTRODUCTION

Pregnancy is associated with changes in the oral cavity that affect the hard and soft tissues of the mouth.[1] Pregnant women alter their eating habits such that they frequently consume foods rich in carbohydrates and acids. The decrease in salivary pH associated with frequent nausea and vomiting is also remarkable, hence pregnant women who do not employ regular and careful oral hygiene suffer from erosions of tooth enamel and develop dental caries. Oral tissues are not spared in pregnancy as frequent and remarkable changes occur in the gingival tissue.[2] There is increased susceptiblity to periodontal disease since higher concentrations of oestrogen and progesterone can induce hyperaemia, edema and bleeding in periodontal tissues, increasing the risk of bacterial infections.[3]

Studies all over the world have investigated oral health during pregnancy.[4,5,6,7,8,9,10,11]

In Nigeria, few immersing studies have perused the oral health practices, oral health statuses and treatment needs of pregnant

women. [12, 13, 14] The dearth of literature on the oral health status and treatment needs of pregnant women in Nigeria is the rationale behind this study. This study was done to determine the oral health status and treatment needs of pregnant women at the Central hospital in Warri, Nigeria.

Materials and Methods

The study area is the city of Warri ; an oil base in South-South Nigeria which shares frontiers with Ughelli/Agbarho, Sapele, Okpe, Udu and Uvwie although most of these places, notably Udu, Okpe and Uvwie, have been amalgamated to the far-reaching cosmopolitan Warri. The cluster sampling technique was used in this descriptive cross-sectional survey. This study was a questionnaire and oral examination based study of 542 women, aged 14 to 50 years seen at the antenatal clinic of Central hospital Warri, the largest government owned hospital in Delta State. The sample size was determined using the formula:

$$n = \frac{z^2 \times p(1-p)}{e^2}$$

n = required sample size, z = confidence level at 95% (standard value of 1.96), p = estimated prevalence in the project area, q =1-p, e = margin of error.

Pregnant females who gave history of medications, use of systemic cortico-steroids, congenital heart disease, existing hypertension and diabetes before the pregnancy were excluded from the study. The socio-demographic characteristics, gestational age, previous dental visit and any present dental complain were obtained using a questionnaire designed for the study. Oral, non-invasive examinations were performed in a well-lit room using additional artificial light by the dentist with participants seated on a chair using a mouth mirror and a periodontal probe.Other instruments used include the sharp probes used for the diagnosis of dental caries. The clinical parameters noted include oral hygiene status, gingival bleeding on probing (presence or absence) and calculus (presence or absence). The methods used involved that of Henshaw[16], who classified oral hygiene as 'good', 'fair' and 'poor.' Oral hygiene was classified as 'good' when no calculus and no soft deposit or debris was seen. Oral hygiene was classified as 'fair' when no obvious calculus was noted and moderate soft deposit or debris was seen. Oral hygiene was classified as ' poor' when when much calculus and much soft deposit or debris were seen.

Oral Calculus Index (Greene & Vermillion) was used to assess the presence of calcified deposits on the teeth. Gingival health status was determined using the Gingival Index of Löe and Silness. [17] Thus gingival health was regarded as being with no inflammation (<0.1); mild gingivitis (0.1-1.0); moderate gingivitis (1.1-1.9); and severe gingivitis (2-3). The modified index by Miller and Damm (1992) [18] was used to determine the degree of gingival swelling. The tissue destruction in those with periodontal disease was assessed using the American Academy of Perio-dontology classification system developed at the 1999 International Workshop.

Ethical approval was obtained from the Ethics Committee of the Central Hospital, Warri. Voluntary informed consent was also gotten from the study participants. Data collection occurred over a period of 3 months from June to August, 2011.The data was analyzed using Statistical Package for the Social Sciences version 18.0. The association between some of the categorical variables were determined using chi-square. *P* - value less than 0.05 was regarded as significant.

Results

Five hundred and forty two female respondents were examined during the period of study.

Table 1 shows the sociodemographic characteristics of the participants. The mean age of the study population is 29.5 years.

Table 1: The socio-demographic characteristics of the subjects

Age (years)	Frequency	Percentage (%)
10-19	14	2.6
20-29	261	48.2
30-39	248	45.8
40 -50	19	3.5
Marital status		
Single	15	2.8
Married	526	97.1
Separated	0	0.0
Divorced	1	0.2
Widowed	0	0.0
Total	542	100
Ethnic group		
Urhobo	211	38.9
Isoko	70	12.9
Itsekiri	56	10.3
Ijaw	18	3.3
Igbo	87	16.1
Ukwuani	15	2.8
Yoruba	15	2.8
Others	70	12.9
Education level		
None	3	0.6
Primary	68	12.6
Secondary	275	50.7
Tertiary	196	36.2

Table 2: Gestational age

Gestational age (weeks)	Frequency	Percentage (%)
25-29	124	22.9
30-35	222	41.0
36-40	196	36.2

Table 3:
History of dental problem before pregnancy

Dental problem before pregnancy	Frequency	Percentage (%)
Present	194	35.8
Absent	348	64.2

Table 4: Treatment needs of the participants

Dental problem	Frequency	Percentage (%)
Hole	48	22.5
Gingival Bleeding	56	26.7
Painful gums	36	16.9
Toothache	56	26.3
Others	17	8.0

Table 4:revealed that the prevalence of dental caries was 22.5%.

Table 5:
History of dental problem during pregnancy

Dental problem during pregnancy	Frequency	Percentage (%)
Present	162	30.0
Absent	380	70.1

Table 6:
Intraoral Examination of the participants

Oral hygiene	Frequency	Percentage (%)
Good	19	3.5
Fair	344	63.5
Poor	179	33.0

Calculus	Frequency	Percentage (%)
0	73	13.5
1	268	49.5
2	161	29.7
3	40	7.4
Total	542	100

Periodontal Condition

Gingivitis	Frequency	Percentage (%)
Absent a a {	64	11.8
Total	542	100
Gingiva swelling	**Frequency**	**Percentage (%)**
Absent	343	63.3
a	118	21.8
a	78	14.4
{	3	0.6

Tissue destruction in periodontal disease

Class	Frequency	Percentage (%)
None	493	91.0
Class I (Gingivitis)		
/ IL Slight periodontitis)		
/ IIL Moderate periodontitis)	0	0.0
/ Ië Severe periodontitis)	2	0.4
/ ë (Refractory periodontitis)	6	1.1

Furcation involvement and exposure

Exposure	Frequency	Percentage (%)
Present	33	5.1
Absent	509	93.9
Fractured teeth	**Frequency**	**Percentage (%)**
Present	7	1.3
Absent	537	98.7

The incidences of gingival bleeding and calculus were 26.7% and 86.5% respectively. A lower percentage 48 (22.5%) of the pregnant women required amalgam fillings, compared to the 56 (26.3%) who required extraction due to caries and the 56 (26.7%) who required scaling, polishing and oral hygiene instructions. A high percentage of the subjects (63.5%) had fair oral hygiene, and a higher incidence of occurrence of gingivitis (88.2%) was observed. Chi-square test revealed that there was no significant association between the level of education and oral hygiene status in the present study (*P* > 0.05).

Discussion

This study was done to determine the oral health status and treatment needs of pregnant women at the antenatal clinic of the Central hospital in Warri.

The observed prevalence of dental caries in the current study is 22.5%. The observed prevalence of dental caries in the current study is less than the 60.4% reported by Murthy et al. in Belgaum, India. [19] The prevalence of dental caries was documented as 62.7% in another study done last year in Raichur District, India. [20] Another study done 2 years ago disclosed that dental caries was present in 53.8% of the study subjects. [21]

The prevalence of periodontal diseases was high in the present study with only 11.8 % of the pregnant women having healthy periodontium. Studies done on pregnant women by Gupta and Acharya in Raichur District, India revealed the prevalence of periodontal diseases as 95%, [20] Jago et al. in Brisbane, Australia revealed 97%, [22] Miyazaki et al. in Japan revealed 95%, [23] and Tonello et al. in Lucas do Verde, MT, Brazil revealed 83.0%. [24] Other findings are lower values like the prevalence of periodontal diseases among pregnant women done by Wandera et

al. in Mbale district, Uganda (67.3%) [25] and Arafat in Baltimore (76.7%). [26]

The current study revealed that gingival bleeding was observed in only 26.7% of the participants even though calculus was present in 86.5%. In Indian gingival bleeding was observed in about 76% of the pregnant participants even though calculus was present in only about 14%. [27] Another study done 2 years ago observed gingival bleeding as a finding present in 47.5% while calculus was present in 24.2% of the study subjects. [21]

The present study revealed that 19 (3.5%) had good oral hygiene, 344 (63.5%) had fair oral hygiene and 179 (33%) had poor oral hygiene. This did not concur with another study that noted that 159 (39.3%) of the pregnant women had good oral hygiene while the rest had moderate accumulation of plaque and calculus with one person who had poor oral hygiene. [28]

Findings in the present revealed that 48 (22.5%) of the pregnant women required amalgam fillings, 56 (26.3%) required extraction due to caries and 56 (26.7%) required scaling, polishing and oral hygiene instructions. A Nigerian study done over a decade ago disclosed that 50% required scaling and polishing and oral hygiene instruction, 13.60% required oral hygiene instruction only, 51.7% of the pregnant women required amalgam fillings and 23.3% required extraction due to caries. [13]

The various studies discussed above reflected differences in the oral health status and treatment needs considered. There may be many explanations for this such as differing socioeconomic factors, methodology and age. Other reasons are differences in the lifestyles and dietary habits of the subjects employed in the various studies. General health risk factors, access to dental care and prompt dental referral are also determinants of oral health status and treatment needs.

This study determined the oral health status and treatment needs of pregnant women at the Central hospital situated in Warri. Cascading the findings in line with the objective of the study, it must be noted that preventive measures exist that pregnant women need to improve oral health and prevent oral disease. The calculus seen in 86.5% leaves much to be desired. Also the 56 (26.7%) who required scaling, polishing and oral hygiene instructions reminds one of the need for preventive measures against oral diseases.

The current study involved an important limitation and that is the self-reported information such as the past dental history of the participants. This is associated with response bias due to misinterpretations by the individuals concerned.

Conclusion

The oral health statuses of these pregnant women were fair even though many had numerous treatment needs. Dental education, oral examination and appropriate referral for therapeutic treatment should be part of antenatal programs. Pregnancy has a definite impact on the oral health status. More researches are needed to determine the extent of impact.

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Prevalence and Clinical Characteristics of HIV Infection Among Patients with End Stage Renal Disease (ESRD) in a Southern Nigerian Public Centre.

Okoye OC. [1] & Chike-Ezue E[1]

ABSTRACT

Background: Chronic kidney disease (CKD), among HIV patients is associated with the development of AIDS defining illnesses, cardiovascular diseases, and high mortality rates. The aim of this study was to determine the prevalence of HIV among ESRD patients on haemodialysis, and to describe the clinical characteristics and outcome of these patients.

Methods: A retrospective cross-sectional study of all ESRD patients who had haemodialysis from Jan 2012 to Jan 2016 in Delta State University Teaching Hospital, southern Nigeria. Socio-demographic data, health status of patient, aetiology of renal disease, clinical and biochemical parameters such as systolic and diastolic blood pressures, packed cell volume, CD4 count, amongst others, were collected.

Results: Of 372 ESRD patients, 8.3% were HIV seropositive. Majority (64.5%) were females, and mean age was 39 ± 10 year. The commonest cause of ESRD was HIVAN (51.6%), and proteinuria was present in 93.3% of patients. Mean CD4 count was 116 ± 52 cells/ul; 96.7% of the patients had CD4 count 200cells/ul. Median time to initiation of dialysis, from diagnosis of HIV was 1 month (IQR 1, 24); 76% of all patients reported being on ART at presentation. Mean duration on haemodialysis was 1 month (IQR 0.6, 1.0).

Conclusion: HIV related kidney disease is a common cause of ESRD among young and middle-aged haemodialysis patients. HIVAN is a predominant cause, and CD4 count is universally low among all patients. Outcome is poor, and may be related to late presentation and poor access to haemodialysis.

Keywords: *HIVAN, end stage renal disease, haemodialysis,*

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INTRODUCTION

Human Immunodeficiency virus (HIV) is an important predisposing factor to chronic kidney disease (CKD). [1] CKD, among HIV patients is associated with the development of AIDS defining illnesses, cardiovascular diseases, and high mortality rates. [1,2] Since the introduction of highly active antiretroviral therapy (HAART), the survival and life expectancy of HIV patients have improved, and the HIV patients now live long to develop chronic diseases, including CKD. [3]

A wide range of CKDs are found in patients with HIV. The most common being HIV associated nephropathy (HIVAN). HIVAN is the most common cause of end stage renal disease (ESRD), particularly in Africans. [4,5] Others are immune complex glomerulonephritis, thrombotic microangiopathy, CKD due to antiretroviral therapy and antibiotics, membranous glomerulonephritis; and CKD due to usual causes in non-HIV population such as diabetes mellitus, hypertension, polycystic kidney disease. [4]

Treatment of ESRD in most HIV patients, usually involves haemodialysis. [6] However, other modalities of renal replacement therapy, (peritoneal dialysis, renal transplantation), are also

available for use in these patients. [6] Initial studies reported high mortality among HIV patients, following initiation of haemodialysis. Although this was attributed to late presentation of patients in advanced stage, it led some nephrologists to question the benefit of haemodialysis in these patients. [6,7]

The number and outcome of HIV patients on haemodialysis, have improved over the years. [3,8] In 2002, Ahuja et al reported an increased survival of HIV patients on haemodialysis in the United States, though the improved survival pale in comparison to HIV negative patients. [3] In addition, data from the French Dialysis Outcomes and Practice patterns Study II, (DOPPS II) revealed a 2-year survival rate of 89 ± 2%. [8] Awobusuyi in Lagos state, Nigeria, [9] has also reported similar outcome in comparison to HIV uninfected patients.

Local data on the prevalence, characteristics, and outcome of HIV patients on haemodialysis are scarce. However, data from different dialysis centres in Nigeria, reveal that 5-16.9% of their haemodialysis population are HIV seropositive. [9-11] Awobusuyi et al reported the highest prevalence of 16.9% from a dialysis centre in the city of Lagos. [9] while Bisallah et al, in Minna, Niger state, reported a much lower prevalence of 5%. [11] Prospective studies involving haemodialysis patients in Nigeria is generally challenging, due to a short (3months) average time on dialysis as a result of mostly financial constraints, resulting in high default rates and mortality. [12]

The aim of this study is to determine the prevalence of HIV among ESRD patients on haemodialysis, and to describe the clinical characteristics and outcome of these patients.

Methods

A retrospective cross-sectional study carried out in Delta State University Teaching Hospital in Southern Nigeria. Records of all haemodialysis treatments performed from Jan. 2012-Jan. 2016 were obtained from dialysis register. All adult patients with chronic kidney disease were included. Patients with acute kidney injury, incomplete or incorrect data were excluded.

Socio-demographic data, health status of patient, aetiology of renal disease, some clinical and biochemical parameters such as systolic and diastolic blood pressures, packed cell volume, CD4 count, were obtained from patients case notes; and collated using Microsoft Excel. HIVAN was regarded as the presence of significant proteinuria (++ and above), normal blood pressure, and large size echogenic kidneys on ultrasound scan.

Data was analyzed using statistical package for social sciences (SPSS) version 22.0 software (SPSS Inc. Chicago, Illinois, USA). The main analysis was the determination of the seroprevalence of HIV among the sample. The clinical characteristics of HIV seropositive patients were described using descriptive statistics (mean and standard deviation, median and interquartile ranges) and proportions.

Results

Of the 372 ESRD patients who underwent haemodialysis during the 5year period, 8.3% (n=31) were HIV seropositive; 1 out of 31(3.2%) had Hepatitis B and hepatitis C co-infection respectively. Majority (64.5%) of the HIV seropositive patients were females, with a sex ratio of 1.6: 1. The mean age was 39 ± 10year, 80.6% of the patients were 50years and below (Table 1).

The commonest clinical symptoms were, facial oedema (80%), abdominal pain 76.7%, vomiting 66.7%, hypertension (56.7%), weight loss (53.3%), cough (53.3%), and dyspnoea (50%), see Table 2. Proteinuria was present in 93.3% of patients, out of which 60% had ++, and 33.3% had +++.

Mean PCV was 24.1 ± 5.1% (Table 3) and all patients were anaemic. Mean CD4 count was 116 ± 52 cells/l (Table 3), and 96.7% of the patients had CD4 count 200cells/ul. Median time to initiation of dialysis, from diagnosis of HIV was 1 month (IQR 1, 24); 70% of the patients were diagnosed 1 month prior to presentation, while 76% of all patients reported being on ART at diagnosis of ESRD.

The commonest causes of ESRD were, HIVAN (51.6%), suspected CGN (19.3%), and Hypertension (16.1%), see Table 3. None of the

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patients with clinical diagnosis of HIVAN had biopsy confirmation. Mean duration on haemodialysis was 1 month (IQR 0.6, 1.0). Median number of dialysis treatment per HIV positive patient was 2 (IQR 1,7).

Discussion

Table 1: Age distribution of Patients Studied.

Age Group (year)	n	Percentage (%)
10-20	2	6.5
21-30	6	19.3
31-40	9	29.0
41-50	8	25.8
51-60	4	12.9
61-70	2	6.5
Total	31	100.0

Table 2: Clinical features of Patients (n=30)

Clinical features	n	%
Proteinuria	28	93.3
Facial swelling	24	80.0
Abdominal pain	23	76.7
Vomiting	20	66.7
Hypertension	17	56.7
Weight loss	16	53.3
Cough	16	53.3
Dyspnoea	15	50.0
Diarrhoea	12	40.0
Haematuria	11	36.7
Seizures	2	6.5

Table 3: Clinical Status and Laboratory Parameters of Patients Studied

Clinical Parameters	n (%) or Mean ± SD
Age (yrs)	39 ± 10
Weight (kg)	56.8 ± 11.9
SBP (mmHg)	141 ± 27
DBP (mmHg)	91 ± 20
Aetiology of ESRD	
HIVAN	16(51.6)
CGN	6(19.4)
HTN	5(16.1)
Diabetes nephropathy	2(6.5)
Adult polycystic kidney disease	1(3.2)
Obstructive nephropathy	1(3.2)
TOTAL	31(100.0)
Laboratory Parameters	
CD4 count (cells/μl)	116±52
Hb (g/dl)	7.2 ± 2.1
WBC	6348 ± 2900
Urea (mg/dl)	236 ± 94
Cr (mg/dl)	14.9 ± 6.8
Sodium (mmol/l)	133 ± 4.0
Potassium (mmol/l)	5.0 ± 0.9
Chloride (mmol/l)	97 ± 22
Bicarbonate (mmol/l)	14 ± 6

The prevalence of HIV among ESRD patients in this study (8.3%) is high compared to reports from European studies, where prevalence is 0.54-0.67%,[7,8] however previous Nigerian studies report a similarly high prevalence.[9-11] The high prevalence of HIV associated kidney in this study may be attributed to the high occurrence of HIV in the African race, and the variation in prevalence rates from region to region within Nigeria, may reflect variations in overall rates of HIV infection. Prevalence of HIV infection is affected by variations in socio-cultural and religious practices, and level of education.[13] HIV infection is less common in northern Nigeria compared to the middle belt and southern Nigeria,[13] it also known to be commoner in Urban compared to rural populations.[17,18]

In this study, majority (51.6%) of HIV seropositive patients had a clinical diagnosis of HIVAN; Awobusuyi et al in Lagos reported 80%.[9] HIVAN, which is the commonest cause of CKD in HIV seropositive patients, almost exclusively affects the blacks race. Among African-Americans, HIVAN is the third leading cause of ESRD;[14] this is also the case in Nigeria, where HIV ranks 3rd-4th as a cause of ESRD.[10,15] In

contrast, no case of HIVAN was recorded in the Spain study. [1]

Although histological diagnosis is essential in patients with suspected HIVAN, in this study diagnosis was based on clinical criteria alone, mainly due to financial implications on patients, who also required funds to initiate and sustain haemodialysis. Other reasons were poor histopathology support, and refusal to give consent. In the presence of these challenges, and the severe clinical presentation of most patients, the nephrologist often has to prioritise haemodialysis, which in the circumstances may be live saving. The plan to biopsy some of these patients after stabilizing them, is often not accomplished as, majority default after a few dialysis treatment.

This study revealed that the mean duration on haemodialysis was 1 month, and the median number of dialysis treatment per HIV positive patient was 2. Unlike in Spain, where the average time on dialysis was 4.6 (0.4-25) years among the HIV dialysed patients[7], the picture is different in Nigeria where average time on dialysis for CKD patients is 3 months. [12] This is mostly because of financial constraints, mortality, and retraction of consent. [12] Considering low mean CD4 count (116cell/l) observed in this study, these patients had advanced HIV infection, which is usually associated with increased morbidity and mortality even in the absence of CKD. Furthermore this finding confirms that HIVAN is usually associated with CD4 <200cells/l. [16] Majority (70%) of the patients were diagnosed less than 1 months prior to presentation, and 76% reported commencing HAART prior to presentation. The implication may be that voluntary screening is yet to be embraced by the public, many patients are only diagnosed with HIV, during hospitalisation or investigation for one of the many complications of the disease.

Proteinuria was the commonest clinical feature among the patients (93.3%) as was expected, and this depicts the presence of glomerular disease. Active HIV infection in the kidney usually gives rise to 2 major glomerulopathies, HIVAN and

HIV immune complex disease (HIVICK). HIVICK presents as IgA nephropathy or diffuse proliferative glomerulonephritis, all of which are associated with significant proteinuria. Anaemia was universal amongst the patients as was expected, and the reason is multifactorial.

Majority of the patients in this study were females, and in the young and middle age group; this reflects what is obtained in most African nations. [13,17,18] In Nigeria, 1.7 million out of 3.2million adults living with HIV were females, as at 2014, furthermore, 1.3% of women between 18-24years were females, compared to 0.7% of men in the same age group. [13]

Conclusion

HIV related kidney disease is a common cause of ESRD among young and middle-aged haemodialysis patients. HIVAN is a predominant cause, and CD4 count is universally low among all patients. Outcome is poor, and may be related to late presentation and poor access to haemodialysis. Majority of patients initiating haemodialysis were recently diagnosed with HIV infection; this necessitates more emphasis on voluntary screening for HIV, to promote early treatment, and reduce mortality associated with advanced disease. Finally, there is need for concerted efforts by all stakeholders to reduce the cost and burden of renal replacement therapy on CKD patients.

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Cigarette Smoking and Thyroid Hormone Levels in Nigerian Smokers.

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ABSTRACT

Background: Cigarette smoking has been linked with thyroid disorders with inconsistent result with some studies linking cigarette smoking to increased thyroid hormone level and others to decreased thyroid hormone levels. Thus, the aim of this study is to further evaluate the effect of cigarette smoking on thyroid hormone pattern in non-alcoholic smokers in North Eastern Nigeria

Methodology: Free Triodothyronine(fT3), Free thyroxine (fT4) and their regulatory hormone, Thyrotrophin stimulating Hormone(TSH) were evaluated in male current smokers (n=140), ex-smokers (n=12) and non-smokers (n=84). The current smokers were also categorized based on daily cigarette consumption (Light (<5 sticks/Day), Moderate (6-10 sticks/day) and Heavy (>10 sticks/day)) and duration of smoking (Short (5-10 years), Medium (11-20 years) and Long (>20 years). A structured questionnaire was used to get information on their clinical history, daily cigarette consumption and duration of smoking.

Results: fT3 and fT4 were found to be significantly elevated in smokers (p<0.05) with no significant change in TSH level(p>0.05). No significant difference was observed between ex-smokers and non-smokers.

Conclusion: The results suggests a direct stimulatory effect of cigarette smoking on thyroid gland and thus at risk of hyperthyroidism, though this effect could be reversed by quitting smoking.

Key words: *Cigarette smoking; Hyperthyroidism; Free Thyroxine; Free Ttriiodothyronine; Thyroid hormones; Thyroid Stimulating Hormone. methods.*

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INTRODUCTION

Cigarette smoking has been reported to have multiple effects on hormone secretion with its attendant clinical implications[1]. Graves's disease, Grave's ophthalmology and thyroid hormone abnormalities has been linked to cigarette smoking[2,3]. The relationship between cigarette smoking and thyroid function is not well understood. This may be due to multiple contrasting pathways in which tobacco smoke can affect the functioning of thyroid gland, individual cross-sectional studies have reported a decrease, an increase, or no effect of smoking on the peripheral thyroid hormones[4]. In studies that show alteration, T4 and reverse T3 (rT3) have been found to be increased along with normal T3 levels in some studies[2,5] whereas others report an increase of T3 only without accompanying rise of T4[6].

One study reported higher levels of free T3 (fT3) and free T4 (fT4) in smokers[7]. A decrease in the levels of both T4 and T3 has also been reported[4]. Accompanying TSH levels were found to be low in some[7,8] and normal in some studies[9]. This present work was carried out to investigate further, the effect of cigarette smoking and

cessation of cigarette smoking on thyroid hormones in North Eastern Nigerian men.

Materials and Methods
This was a population based case–control study carried out in the three urban cities in northeastern part of Nigeria. The survey was conducted from November 2011 to May 2012.The participants include adult males who were living in the location of the study. The following assumptions were used to calculate the sample size for the smokers. The acceptable margin of error was 5%, with a standard deviation of 1.96 at 95% confidence interval, and a prevalence rate of 9.0% obtained from the 2008 Nigeria Demographic and Health Survey (2008)[10] . The sample size of 125 was calculated using a Cochran's formula. A participation rate of 80% was anticipated and the final sample size was increased to 140.

A group of one hundred and forty (140) male current non –alcoholic cigarette smokers and twelve (12) ex-smoker were recruited from Maiduguri, Damaturu and Potiskum, all in North-Eastern Nigeria. Eighty-four (84) age-matched apparently healthy non-smokers were also recruited from the same metropolitan areas to serve as control. All participants in the study were included after obtaining written consent. They were between the ages of 25-60 years and current smokers must have been smoking for at least five (5) years. A physical examination was done on each subject. This includes examination for the presence of thyroid enlargement, tenderness or nodules. Those with medical conditions such as diabetes, hypertension, tuberculosis and autoimmune disease were excluded from the study. Clinical examination was done by a medical practitioner. Information on demographic, anthropometric and life style factors of each participant was obtained through a well-structured questionnaire. The permission to conduct research was obtained from the State Ethical Committee before the commencement of the study.

Grouping of subject
The smokers were grouped according to the intensity of smoking (number of cigarette smoked per day)[11] light smokers (1–5 sticks of cigarette daily), moderate smokers (6–10 sticks of cigarette daily), and heavy smoker>10 sticks of cigarette daily) and also according to the duration of smoking: short term (5–10 years of smoking) smokers, medium term (11–20 years of smoking) smokers and long term (>20 years of Smoking) smokers.

Collection of blood sample
The blood sample from the subjects was collected after an overnight fast. The blood sample was collected between 08.30-10.00 a.m each day. The venepuncture was done in the cubital fossa. Fasting blood sample (15 ml) was aseptically collected from each participant and poured into a plain bottle. It was left undisturbed for an hour. The blood sample was then centrifuged at 4000Xg for 10 minutes and serum collected was stored at -20°C and analysis of biochemical indices of thyroid functions was done in two weeks.

Biochemical Analysis
Thyroid hormones (fT3,fT4 and TSH) were analysed by Enzyme linked Immunosorbant assay (ELISA) using standard ELISA kits(Monobinds Inc., USA).

Statistical Analysis
Data obtained for each biochemical parameter was expressed as mean $\pm$ standard error of mean (SEM). The difference between means were compared using one way analysis of variance (ANOVA) followed by Duncan's post hoc test using SPSS version 20 (SPSS Inc., Chicago, Illioinous) and $p<0.05$ was considered significant.

Results
There was a significantly increased levels of fT3 and fT4 in smokers ($p<0.05$) when compared with control that tend to increase with duration and number of cigarette smoked per day with no significant change in TSH. However, fT3, fT4 and TSH concentration of control and ex-smokers were not significantly different (Table 1). There

Table 1: Effect of cigarette smoking on thyroid hormone levels of smokers and ex-smokers

Subjects	Thyrothrophin Stimulating Hormone (μIU/ml)	Free triodothyronine (pg/ml)	Free Thyroxine (ng/dl)
Control (n=84)	2.61±0.13[a]	2.48±0.11[a]	1.17±0.04[a]
Smokers (n=140)	2.36±0.09[a]	4.10±0.12[b]	1.64±0.04[b]
Ex- smokers (n=12)	2.50±0.30[a]	2.50±0.27[a]	1.13±0.04[a]

Values with different superscripts are significantly different at p<0.05 | Values are mean ± standard error of mean

Table 2: Effect of cigarette smoking on thyroid hormone levels of smokers

Subjects	Thyrothrophin Stimulating Hormone (μIU/ml)	Free triiodothyronine (pg/ml)	Free Thyroxine(ng/dl)
Control (n=84)	2.61±0.13[a]	2.48±0.11[a]	1.17±0.04[a]
Light smokers (n=26)	2.29±0.19[a]	3.66±0.29[b]	1.31±0.06[a]
Moderate smokers (n=66)	2.48±0.12[a]	3.83±0.15[b]	1.64±0.05[b]
Heavy smokers (n=48)	2.26±0.17[a]	4.70±0.21[c]	1.82±0.06[c]

Values with different superscripts are significantly different at p<0.05 | Values are mean ± standard error of mean

Table 3: Thyroid hormone levels according to the duration of cigarette smoking

Duration	Thyrothrophin Stimulating Hormone (μIU/ml)	Free triiodothyronine (pg/ml)	Free Thyroxine (ng/dl)
Control (n=84)	2.61±0.13[a]	2.48±0.11[a]	1.17±0.04[a]
5 – 10 years (n=53)	2.27±0.13[a]	3.66±0.18[b]	1.40±0.05[b]
11 – 20 years (n=48)	2.50±0.19[a]	4.22±0.21[c]	1.73±0.06[c]
> 20 years (n=39)	2.37±0.13[a]	5.16±0.19[d]	2.03±0.07[d]

Values with different superscripts are significantly different at p<0.05 | Values are mean ± standard error of mean

was a dose and duration dependent elevation in the levels of fT3 and fT4 in smokers (Table 2 and 3) with no significant difference (p>0.05) in fT3 level between light and moderate smokers.

Discussions

Cigarette smoking has been reported to have multiple effects on hormone secretion, some of which are associated with important clinical implications. Smoking has been reported to affect pituitary, thyroid, adrenal gland functions, calcium metabolism and action of insulin[1]. Data from this study indicated elevated levels of fT_3 and fT_4 in smokers that were both duration and

dosage dependent (Tables 2 and 3). This is also consistent with the findings of Utiger, (1998)[12] and Aswold et al., (2007)[8]. Nicotine, a constituents of cigarette smoke has been reported to stimulate sympathetic nervous system and thus increases secretion of Thyroid hormones[13]. In addition, another cigarette smoke constituents, 2,3 hydroxypyridine, inhibits T_4 deiodination by limiting deiodinase activity leading to elevated serum thyroxine level (T_4). On the other hand, 3,4 –benzylpyrene a poly aromatic hydrocarbon in cigarette smoke has been reported to elevate thyroxine deiodination[1] resulting in elevated levels of triiodothyronine

(fT3). Alternatively, hydroquinone, another constituents of cigarette smokes has been reported to cause hepatotoxicity[2]. This will impair degradation of thyroid hormones and thus resulted in their elevated levels as seen in this study. Furthermore, cigarette smoking may have direct stimulating action on thyroid glands[12] and thus an endocrine disruptor. The reduced level of TSH level seen in smokers in this study though non-significantly might be as a result of feedback mechanism resulting from elevated levels of fT3. These elevated level of thyroid hormones was reversed with cessation of smoking (Table1).

We concluded that cigarette smoking stimulates thyroid hormone secretion and thus are predisposed to thyroid disorder, which can be ameliorated with cessation of smoking.

Acknowledgement

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Tubal Factor Infertility: Hysterosalpingography and Laparoscopic Evaluation in Ilorin, Nigeria.

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ABSTRACT

Objectives: To compare diagnostic accuracy of laparoscopy and HSG in the evaluation of tubal patency among infertile women.

Materials and Methods: A cross-sectional prospective study of infertile women who underwent HSG and laparoscopy for tubal patency between 1st January 2011 and 31st December 2015.

Results: Ninety-seven (97) eligible patients were included in the study. The patients were aged 21-50 years with a mean age of 33 ± 6.6 years. Majority **(79.4%)** were nulliparous. Most (63.9%) belong to middle social class. Fifty (51.5%) had primary infertility while (48.5%) had secondary infertility. Their duration of infertility ranges from 1-33 years (5.6 ± 5.5). HSG revealed bilateral tubal blockade in 23 (23.7%), bilateral patent tubes in 38 (39.2%) and unilateral patent tube in 36 (37.1%) while laparoscopy showed bilateral tubal blockade in 18 (18.6%), bilateral patent tubes in 51 (52.6%) and unilateral patent tube in 28 (28.8%) respectively. There was significant difference between HSG and laparoscopic findings on tubal status determination ($p < 0.05$). Laparoscopy revealed other tubal and non-tubal pelvic findings not evident on HSG. The sensitivity of HSG was 100%, specificity was 93.7%, and the positive predictive value was 78.3%, with a negative predictive value of 100%.

Conclusion: HSG and laparoscopy are of diagnostic importance in the evaluation of tubal status; however, laparoscopy is superior most especially in the detection of other tubal and non tubal pathologies which could be responsible for infertility; thus both tests are complimentary.

Keywords: *Laparoscopy, Hysterosalpingography, Tubal patency, Ilorin*

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INTRODUCTION

Infertility and childlessness remain one of the most common and underappreciated reproductive health problems in developing countries.[1] The inability to procreate is frequently considered a personal tragedy and can result in marital instability and suicidal tendencies.[1] It is one of the most common disorders confronting gynecologists and is defined as the inability to conceive after one year of regular unprotected intercourse.[1, 2] The prevalence of infertility has increased in the last decade due to increase in sexually transmitted diseases most especially in the third world countries and an increased tendency to delay child bearing.[2]

Tuboperitoneal factors are responsible for about 30-40% of female infertility and hence evaluation of tubal patency represents a key step and a basic investigation in the assessment of infertile women. Tubal occlusion is the most common underlying cause of infertility and the incidence varies from country to country.[1,3] Several studies have reported rates of between 5 – 15% in developed countries. However, in tropical Africa, infertility rates are between 10%-20%, although prevalence rates of up to 30% and even 50% have

been reported in the Congo. [1, 4]

It has been estimated that PID – related tubal adhesions, causes 30 – 50 % of all cases of female infertility worldwide. [4] In Africa, this is usually due to Neisseria gonorrhea and ranges from 42 to 77% in the literature. [4] Even with treatment, bilateral tubal occlusion was noted in 20% of cases in one series done in Kenya.[4]

Ever since Rubin described the tubal insufflations test in 1920 by using CO_2, numerous methods have been developed for evaluation of tubal status. Hysterosalpingography (HSG) and laparoscopic chromopertubation are widely employed.[5]

Although both HSG and laparoscopy are invasive techniques, HSG is much less invasive than laparoscopy. Furthermore, HSG being a relatively inexpensive, simple and rapid diagnostic test continues to be the first line approach in assessing tubal patency.[2]

Laparoscopy and dye insufflations is recommended by the Royal College of Obstetricians and Gynecologists as the tubal patency investigation of choice for infertility.[6] This study compares diagnostic accuracy of hysterosalpingography and laparoscopy on tubal factor infertility at the University of Ilorin Teaching Hospital to assess their diagnostic accuracy.

Materials and methods:

This is a cross- sectional prospective study of 97 patients with infertility who were managed at the Assisted Reproductive Technology Unit of University of Ilorin Teaching Hospital, Ilorin between 1st January 2011 and 31st December 2015. All patients had complete hormonal profile (LH, FSH, E2, P2, Prolactin and Testosterone) and abdomino-pelvic/ Transvaginal ultrasound for their infertility work up and any abnormalities was corrected. Informed consent was routinely obtained from our patients prior to any procedure and possibility of conducting a research on their findings. Patients' case notes were reviewed alongside information extracted from ward registers and theater records. Information obtained included age; duration and type of infertility along with findings on HSG and laparoscopy were documented.

HSG was usually performed prior to ovulation between menstrual cycle days 7 and 12 to avoid potential pregnancy and to take advantage of thinner proliferative phase endometrium. Patient was placed in dorsal lithotomy position and following vulval cleaning, a tenaculum was used to grasp the anterior lip of the cervix. A Leech-Wilkinson cannula was introduced through the cervical os and water-soluble radio opaque contrast dye injected into the uterine cavity. Serial X-ray films were taken during the procedure; before cannulation (the preliminary film), during the filling phase of uterine cavity by contrast material, and as the dye leaks out and spread in the pelvic cavity – usually after about 30 minutes of contrast instillation (delayed film).

Laparoscopy was performed 6 months following HSG if no evidence of pregnancy. Patients were evaluated and confirmed fit for surgery. Complete blood count, urinalysis, electrolyte, urea and creatinine estimation were requested pre-operatively. Patients also had bowel preparation with Dulcolax and enema saponis. All procedures were performed under general anesthesia.

In positioning of patients for the procedure, both the modified Trendelenburg and Lloyd-Davis positions were used according to preference of the surgeon. The anterior abdominal wall was lifted between gauze pads and a Veress needle was passed at the sub-umbilical region.

Pneumoperitoneum was created with carbon dioxide insufflation using an electronic insufflator at 4-6l/min and preset pressure of 12-15 mmHg. Next, the Veress needle was removed, the incision extended to 10cm and a 10mm trocar and cannula were passed through the incision. The trocar was then removed, and the laparoscope inserted into the peritoneum through the primary port and panoramic evaluation of the abdominal cavity was undertaken by rotating camera through 360 degrees to rule out any adherence of bowel and decision made depending on the procedure for inserting secondary ports through small incisions under direct vision with attention to the deep inferior epigastric vessels using base-ball diamond concept. Tubal patency was then confirmed by instilling diluted methylene blue dye

through a Leech-Wilkinson cannula at the cervix and looking out for spillage of the dye through the fimbrial ends of the tubes. Other tubal and non-tubal pelvic abnormalities were operated upon by the surgeon e.g. adhesiolysis, ovarian cystectomy, laparoscopic ovarian drilling and myomectomy. After the procedures, the peritoneal cavity was lavaged with warm saline and sunctioned out. Instruments and laparoscope were removed under direct vision. Patients were usually discharged within 24 hours of procedure.

Data was collected using a proforma designed for that purpose and descriptive statistical analysis was carried using a commercial statistical package (SPSS/PC version 16.0, SPSS Inc., Chicago, III, USA). A p-value of < 0.05 was considered as statistically significant. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of HSG were calculated with 95% confidence interval.

Results

The study included ninety-seven patients evaluated for infertility that had HSG and laparoscopy in their work up. The mean age of the patients was 33± 6.6years (Range: 21 to 50years). Majority (79.4%) was nulliparous and their duration of infertility ranges from 1to 13 years (5.6 ± 5.5). Sixty-two (63.9%) belong to middle social class. Fifty (51.5%) had primary infertility while (48.5%) had secondary infertility (Table 1).

Table 2 shows the tubal patency status of patients by both hysterosalpingography and laparoscopy. HSG revealed bilateral tubal blockade in 23 (23.7%), bilateral patent tubes in 38 (39.2%) and unilateral patent tube in 36 (37.1%) while laparoscopy showed bilateral tubal blockade in 18 (18.6%), bilateral patent tubes in 51 (52.6%) and unilateral patent tube in 28 (28.8%) respectively.

Table 1: Socio-demographic variables		N=97
Variables	**Frequency**	**Percentage(%)**
Age of Wife (years)		
20-29	31	31.9
30-39	49	50.5
40-49	15	15.5
50-59	2	2.1
Range = 21-50		Mean= 33±6.6
Parity		
0	77	79.4
1	19	19.6
2	1	1.0
Social Class		
Upper	19	19.6
Middle	62	63.9
Lower	16	16.5
Type of Infertility		
Primary	50	51.5
Secondary	47	48.5
Duration of Infertility		
1-10	86	88.7
11-20	9	9.2
21-30	2	2.1
Range =1-33 years		Mean= 5.6 ± 5.5

Table 2: Tubal patency status on Hysterosalpingogram and laparoscopy

Variables	Frequency	Percentage (%)
HSG		
Bilateral Blocked tube	23	23.7
Bilateral patent tube	38	39.2
Unilateral patent tube	36	37.1
Laparoscopy		
Bilateral Blocked tube	18	18.6
Bilateral patent tube	51	52.6
Unilateral patent tube	28	28.8

Table 3: Comparing diagnostic accuracy of Laparoscopy and HSG

HSG	LAPAROSCOPY		
	Blocked	**Patent**	**Total**
Blocked tubes	18	5	23
Patent tubes	0	74	74
Total	18	79	97
	χ^2 = 76.02	df=2 p=0.000	

Sensitivity = 100%, Specificity= 93.7%, Positive Predictive value (PPV) = 78.3%
Negative Predictive value (NPV) = 100%

Table 4: Tubal and non-tubal laparoscopic pelvic findings

Diagnosis	Number of cases	Percentage (%)
Normal	10	10.3
Tubal Blockage	18	18.6
PCOS	25	25.8
Ovarian cyst	10	10.3
Endometriotic cyst	10	10.3
Uterine Fibroid	13	13.4
Peritubal/ovarian adhesion	11	11.3

Table 3 shows the performance of HSG in the diagnosis of tubal patency compared to laparoscopy. There was significant difference between HSG and laparoscopic findings on tubal status determination (p <0.05). The sensitivity of HSG was 100%, specificity was 93.7%, and the positive predictive value was 78.3%, with a negative predictive value of 100%. Laparoscopy revealed other tubal and non-tubal abnormalities not evident on HSG. This included Polycystic ovaries 25 (25.8%), uterine fibroid 13 (13.4%), peritubal and periovarian adhesion 11 (11.3%) and bilateral tubal blockade 18 (18.6%) (Table 4).

Discussion
Exploration of the female genital tract is one of the essential elements of infertility assessment.

Mechanical factors account for approximately 30% of infertility in women, and various methods such as transvaginal ultrasonography, hysterosalpingography (HSG), hysteroscopy and laparoscopy have been used to determine the underlying factors.[7,8]

Laparoscopy is the best technique for diagnosing tubal and peritoneal disease and provides both a panoramic view of the pelvic reproductive anatomy and a magnified view of pelvic organs and peritoneal surfaces and permits detection of uterine fibroids, peritubal and periovarian adhesions, and pelvic endometriosis.[5] Laparoscopy also allows careful assessment of the external architecture of the tubes and in particular the visualization of the fimbria.[7] It is generally accepted that, diagnostic laparoscopy is the gold standard in diagnosing tubal pathology and other intra-abdominal causes of infertility even though, it has the disadvantage of being an invasive procedure associated with morbidity and mortality.[5,7,8]

Hysterosalpingography, on the other hand, is a frequently utilized diagnostic method in the assessment of tubal status and detection of intra uterine anatomical defects in infertility diagnostic workup. However, the inadequacy of HSG in determining the state of tubal patency, emphasizes the need for laparoscopy.[9]

The mean age of the patients in this study was 33± 6.6 years (range: 21 to 50 years) which is higher than findings from a similar study by Mol et al,[10]. This may be related to poor orthodox health seeking behaviors among infertile couples most especially assisted conception centers in our environment coupled with delayed marriage primarily due to pursuance of academic carriers. Also, most of the patients (63.9%) belong to middle social class as against majority of subjects in lower social class in a previous study by Seal et al,[5] this is because the present study was conducted in a dedicated fertility research institute with facility for assisted reproduction technology as such financial accessibility is restrictive though the centre has provision for few indigent patients for their fertility treatment.

This study compared HSG and laparoscopy in the diagnosis of tubal factor infertility. HSG is the initial investigation to assess the patency of the fallopian tubes. This is because it is less invasive and more cost effective. However, pain is the most common complaint that patients gave after returning from an HSG session.[2] Other likely complications include allergic reactions to contrast, pelvic infections, endometriosis, tubal rupture (due to contrast material given under pressure in patients with hydrosalpinx) and radiation exposure. Therefore, known hydrosalpinx, acute PID or cervicitis, and adnexal mass palpable on bimanual examination all constitute contraindications to HSG.[2,5]

The study showed that HSG though with high sensitivity (100%) and negative predictive value (100%), has lower specificity (93.7%) and positive predictive value of 78.3% resulting in false positive results. The false positive result could be explained by the fact that spasm of uterine/tubal musculature (due to pain mentioned earlier) during HSG may cause non-demonstration of one or both fallopian tubes. Buscopan is known to be effective in relieving tubal spasm as demonstrated by Akintomide et al[12] who observed tubal patency after it administration in nine cases that previously showed occlusion.[11,12] Glucagon is another agent used for this purpose.[13] However; this is not practiced in our centre. Tubal spasm does not occur in laparoscopy because it is performed under general anaesthesia with good relaxation of pelvic organs.

Findings from this study also showed that 60.8% of the patients were found to have tubal blockage by HSG which is higher than the 47.4% recorded for laparoscopy. This is however different from result of Okonofua et al[8] who studied 48 patients with HSG, laparoscopy and laparotomy, the latter taken as the reference. In HSG, 5 patients had normal tubes and 43 patients abnormal tubes. For laparoscopy, these numbers were 3 and 45, and for laparotomy 2 and 46 even though, the authors did not calculate sensitivity and specificity for their study.[8] Mol and colleagues assessed 794 infertile women in whom both HSG and laparoscopy was performed. They found sensitivity and specificity values for HSG to be 81% and 75% respectively.[10]

When comparing HSG and laparoscopy, we

should keep in mind that both procedures provide more information than the condition of the Fallopian tubes alone. Whereas HSG provides information on the status of the intrauterine cavity, laparoscopy allows detection of other tubal, non-tubal and intra-abdominal lesions that could impact on fertility as demonstrated by the detection of uterine fibroids, endometriotic cyst, ovarian cyst, Polycystic ovaries and peritubal and periovarian adhesions which were resolved in the present study. [14]

Conclusion:
Both HSG and laparoscopy are of diagnostic importance in the evaluation of tubal patency in the management of both primary and secondary infertility. However, HSG should be a first line modality due to its being less invasive, lower cost and fewer complications. Laparoscopy being more superior most especially in the detection of other tubal and non-tubal pathologies should be reserved for cases of bilateral tubal occlusion following HSG before proceeding to the extreme of offering IVF to such couples.

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Male Involvement in Child Health Activities: Spousal Perspectives in in Urban Community in Southern Nigeria

Adam VY & Aigbokhaode AQ

ABSTRACT

Background: Over the years, several initiatives and programmes have been introduced to reduce morbidity and mortality among children without emphasis on male participation. This study ascertained male involvement in childcare activities in an urban community in Southern Nigeria.

Materials and Methods: A descriptive cross-sectional study was carried out in an urban community in Southern Nigeria, between December, 2013 and January, 2014 among 390 mothers in the community using cluster sampling method. Data collection utilized a structured, interviewer-administered questionnaire adapted from UNICEF/IMCI household baseline survey questionnaire. Data were analyzed with the IBM SPSS version 20 software.

Results: Most of the respondents, 354(90.8%) and 364(93.3%) were married and in monogamous marriage type. The mean age of the respondents was 36.7(±11.2) years. Of the reported male involvement in childcare activities, over three-quarters, 330(84.6%) and 327(83.8%) supported exclusive breastfeeding and buy medication for the child. More than two-thirds, 286(73.3%) and 284(72.8%) take child to the hospital when ill and support child immunization respectively. There was an association between some socio-demographics of respondents and partners' and male involvement in various childcare activities.

Conclusion: Majority of spouses of respondents participated in various childcare activities at different levels of involvement. Age, ethnicity, level of education, occupation and monthly income of respondents were associated with some male involvement in childcare activities. Sustained health enlightenment programs emphasizing the importance of male involvement in childcare activities by both the community and the Local Government should be carried out.

Key words: *Male involvement, Child health activities, Spousal perspectives, Urban area*
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INTRODUCTION

There is great disparity in the life expectancy at birth between the developed and developing countries, and this poor health outcome is mainly due to poor parental care and health seeking from birth.[1,2] Under-5 mortality is a strong indicator of the health and well being of children and the entire population.[3,4] Currently, the under-5 mortality rate is 43 deaths per 1,000 live births.[5] In 2012, 6.6million children died before their fifth birthday and half of these deaths occurred in sub-Sahara Africa. Most of these deaths are due to preventable causes and treatable diseases, such as: poor parental or caregivers participation child care; malaria; pneumonia; diarrhoea; measles; HIV; neonatal conditions; malnutrition; and injuries.[3-7] All these worsen child survival globally and are further threatened by poor male participation in child healthcare activities in Nigeria.[8]

In many parts of Africa, pregnancy, child birth, child rearing and domestic chores are viewed by men as women's responsibilities and as such, the men deprive their spouses of financial and emotional support needed to take care of the family.[9] Also, the health status of women and children suffer significantly where women are not

empowered and play minimal role in decision making. Resulting in low utilization of healthcare services with the consequences of high infant morbidity and mortality rates that could prevent the attainment of MDGs 4.[10]

The Millennium Development Goals 4 and 5 which are concerned with the reduction of child mortality and improving maternal health have been implicated in some WHO data as the two furthest MDGs from being achieved in 2015[3] and at present do not have any indicator for male involvement in their achievement.[6,11] The poor knowledge and involvement of males in the practices of child health interventions has resulted in higher maternal/child morbidity and mortality, especially in the aspect of care seeking and compliance.[2,11]

Over the years, several initiatives and programmes were introduced to reduce morbidity and mortality among children in Nigeria, such as: Maternal and Child Survival Strategies; Integrated Disease Surveillance and Response (IDSR); Integrated Management of Childhood Illness (IMCI) Strategy among others.[12,13] These have all been without emphasis on male involvement. In line with the millennium declaration more in-depth implementation plans for newborn and child health have evolved.[6,7] These are evidence-based interventions identified at global level and the modes of delivering these interventions are population-oriented outreach and schedulable services, individual-oriented clinical services and family/community services.[6,7]

The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) developed 16 key household practices/services in Durban, South Africa in June 2000,[14] and was adopted by Nigeria in 2007. These key household practices are family-oriented, community-based services that are divided into growth promotion and development; home management; disease prevention; and care seeking including compliance. The participation of men in childcare health activities is a subset of care seeking and compliance.[14,15]

Prior to the development of the key household practices, the ICPD +5 Forum of 1999 conference emphasized that "...Special efforts should be made to emphasize men's shared responsibility and promote their active participation in responsible parenthood (family planning; prenatal, maternal and child health); prevention of transmitted diseases (such as HIV); prevention of unwanted and high-risk pregnancies; shared control and contribution to family income, children's education, health and nutrition; and recognition and promotion of the equal value of children of both sexes."[16,17]

Male involvement in childcare activities will enhance the promotion of a healthy family, community and nation by reducing childhood morbidity and mortality. Hence, this study ascertained male participation in child care activities in an urban community in Edo State, Southern Nigeria.

Materials and Methods
A descriptive cross-sectional study was carried out in Isiohor, an urban community in Ward 6 of Ovia Local Government Area of Edo State, Southern Nigeria, between December, 2013 and January, 2014 among 390 mothers in the community. Isiohor community is located along Benin-Lagos expressway, bounded on the north by Ekosodin, on the east by Ugbowo, on the south by Ohonre and on the west by Iguosa. The inhabitants of the community are majorly Benins and Christians.
Ovia North East Local Government Area with its headquarters in Okada, has an area of 2,301km^2 and a projected population of 187,662 as at 2013.[18] The Local Government comprises 13 political wards namely: Okada West, Okada East, Ohen, Adolor, Ofunmwengbe, Oluku, Uhiere, Isiuwa, Okokhuo, Oghede, Oduna, Iguoshodin, and Utoka.[19]

A minimum sample size of 378 was calculated for the study using the formula for studying proportion,[20] $\mathbf{n = z^2 pq/d^2}$. Prevalence, **p** of 56.2% which corresponds to the percentage of males who assisted in domestic chores at home in a study done in Nepal.[21] The sample size used for this study was 390.

Data were collected using a structured, interviewer-administered questionnaire adapted from UNICEF/IMCI household baseline survey questionnaire.[22] Research assistants comprised of final year medical students of the School of Medicine, University of Benin. A cluster sampling of all mothers who were permanent residents of the community and were present during the study period residing on the left side of the community (selected using simple random technique by balloting), which was divided into two by an earth road off the Benin-Lagos Express Road was done in the study. The occupation of respondents was classified into skill levels according to the International Labour Organization classification.[23] The unit for monthly income is the Nigerian currency, Naira (₦).

The questionnaires were screened for completeness and coded by the researchers. Data were entered into and analysed with the IBM SPSS version 20 software and WinPepi version 11.46. Data were presented as percentages, mean ± standard deviation and frequency tables. Statistical test of association between different variables was also carried out using chi-square and Fisher's test where applicable, with level of significance set at p < 0.05.

Ethical considerations

Approval to carry out the study was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital and permission was sought from the Head of the community. Verbal informed consent was obtained from each of the respondents. Confidentiality and privacy of the respondents was respected during the interviews. Health education of the respondents on key household practices in child health activities was carried out after questionnaire administration.

Results

Over a third of the respondents, 149(38.2%) were in the age group 31-40 years. The mean age of the respondents was 36.7(±11.2) years. Over two-thirds, 270(69.2%) of the respondent's spouses were Edo indigenes. Most of the

respondents 354(90.8%) and 364(93.3%) were married and in monogamous marriage type. Majority of the participants' spouses, 192(49.2%) had secondary level of education and almost the same proportion (50.3%) were in skill level 2 occupational classification. Slightly less than half, 178(45.6%) earned between 10,000-40,000 naira as monthly income. **Table 1.**

Table 1: Socio-demographic Characteristics of Respondents and their Partners

Variables	Frequency (n=390)	Percent (%)
Age group (years)		
= 20	8	2.1
21-30	120	30.8
31-40	149	38.2
41-50	69	17.7
> 50	44	11.3
Partners' ethnicity		
Edo indigenes	270	69.2
Non-Edo indigenes	120	30.8
Marital status		
Single	2	0.5
Married	354	90.8
Widowed	15	3.8
Separated	6	1.5
Co-habiting	13	3.3
Marriage type		
Monogamy	364	93.3
Polygamy	26	6.7
Partners' occupation		
Skill Level 1	48	12.3
Skill Level 2	196	50.3
Skill Level 3	4	1.0
Skill Level 4	142	36.4
Partners' LOE		
No formal	8	2.0
Primary	51	13.1
Secondary	192	49.2
Tertiary	139	35.6
Partners' Income (?)		
=10,000	86	22.1
10001-40,000	178	45.6
40,001-70,000	71	18.2
70,001-100,000	26	6.7
=100,001	29	7.4

*Mean age of the respondents = 36.7(±11.2) years | **LOE** = Level of education*

Table 2: Reported spousal participation in childcare activities

Types of participation	Frequency*	Percent
Providing money for child's feeding	371	95.1
Paying child's school fees	368	94.4
Encouraging exclusive breastfeeding	330	84.6
Buying medication for the child	327	83.8
Providing money for child's clothing	313	80.3
Taking the child to school	298	76.4
Taking ill child to hospital	286	73.3
Support child immunization	284	72.8
Doing household chores	138	35.4
Going to the market	79	19.0
Taking child to religious center	3	0.8

Of the reported male involvement in childcare activities, over three-quarters, 330(84.6%) and 327(83.8%) support exclusive breastfeeding and buy medication for the child. More than two-thirds, 286(73.3%) and 284(72.8%) take child to the hospital when ill and support child immunization respectively. **Table 2.**

Ethnicity, level of education and occupational status of respondents' partners all had statistically significant differences in association with the male support for exclusive breastfeeding of the child with p-values of 0.009, 0.007 and 0.026 respectively. **Table 3.**

Age of respondents (p = 0.003), ethnicity and monthly income of respondents' partners (p = 0.003) and (p = 0.014) were significantly associated with the male participation in taking the child to the hospital when ill. **Table 4.**

Ethnicity and level of education of respondents' partners were associated with male involvement in the purchase of medication for the child and the association was statistically significant, p = 0.023 and 0.036 respectively. **Table 5.**

Discussion

The various male involvement in childcare activities ranging from assistance in carrying out domestic chores, provision of educational and feeding support including meeting health demands of the children reported by a high proportion of the respondents is commendable and similar to reports from a previous study.[24] This participation of the males in childcare activities could be perceived as a male obligation[24,25] especially for married couples as evidenced by the high proportion of married respondents in this study.[24] The high involvement of males in child care and health activities in this study could promote healthy family and community, with possible effect of reducing childhood morbidity and mortality, thus promoting achievement of Sustainable Development Goal (SDG) 3. In addition, the children would have better cognitive-academic performance, optimal growth and development, including overall improvement in health outcome of the children as a result of the participation of males in childcare activities. The high level of education of the spouses could be utilized for sustained propagation of important health enlightenment programmes including those related to male participation in reproductive and child health activities in the study locale.

Spousal support for exclusive breastfeeding, immunization and female education which are integral parts of the child survival strategies, including provision of medication for the child

Table 3: **Socio-demographics and partners' support of exclusive breastfeeding**

Variables	Support of exclusive breastfeeding Frequency (%)	
	Yes	**No**
Partners' ethnicity		
Edo Indigenes	237 (87.8)	33 (12.2)
Non-Edo Indigenes	93 (77.5)	27 (22.5)
	χ^2 = 6.741, p = 0.009*	
Marriage type		
Monogamy	309 (84.9)	55 (15.1)
Polygamy	21 (80.8)	5 (19.2)
	χ^2 = 0.317, p = 0.574	
Family type		
Nuclear	288 (85.2)	50 (14.8)
Extended	42 (80.8)	10 (19.2)
	χ^2 = 0.682, p = 0.409	
Partners' LOE		
= Primary	43 (72.9)	16 (17.1)
= Secondary	287 (86.7)	44 (13.3)
	χ^2 = 7.353, p = 0.007*	
Partners' occupational classification		
Skill level 1	36 (75.0)	12 (25.0)
Skill level 2	161 (82.1)	35 (17.9)
Skill level 3	4 (100.0)	0 (0.0)
Skill level 4	129 (90.8)	13 (9.2)
	Fisher's exact, p = 0.026*	
Partners' monthly income (?)		
<10,000	68 (79.1)	18 (20.9)
10,001-40,000	155 (87.1)	23 (12.9)
40,001-70,000	63 (88.7)	8 (11.3)
70,001-100,000	22 (84.6)	4 (15.4)
>100,000	22 (75.9)	7 (24.1)
	χ^2 = 5.493, p = 0.240	

*statistically significant; **LOE** = Level of education*

Table 4: Socio-demographics and partners' involvement in taking ill child to hospital.

Variable	Taking ill child to hospital	
	Frequency (%)	
	Yes	**No**
Age of respondents (years)		
< 40	215 (77.6)	62 (22.4)
> 40	71 (62.8)	42 (37.2)
	Ä = 8.972, p = 0.003*	
Partners' ethnicity		
Edo indigenes	186 (68.9)	84 (31.1)
Non-Edo indigenes	100 (83.3)	20 (16.7)
	Ä = 8.864, p = 0.003*	
Marriage type		
Monogamy	271 (74.5)	93 (25.5)
Polygamy	15 (57.7)	11 (42.3)
	Ä = 3.485, p = 0.062	
Family type		
Nuclear	248 (73.4)	90 (26.6)
Extended	38 (73.1)	14 (26.9)
	Ä = 0.002, p = 0.964	
Partners' level of education		
≤ primary	38 (64.4)	21 (35.6)
≥ secondary	248 (74.9)	83 (25.1)
	Ä =2.833, p = 0.092	
Partners' occupational classification		
Skill level 1	30 (62.5)	18 (37.5)
Skill level 2	142 (72.4)	54 (27.6)
Skill level 3	4 (100.0)	0 (0.0)
Skill level 4	110 (77.5)	32 (22.5)
	Fisher's exact, p = 0.149	
Partners' monthly income(?)		
<10,000	54 (62.8)	32 (37.2)
10,000-40,000	138 (77.5)	40 (22.5)
40,000-70,000	48 (67.6)	23 (32.4)
>70,000	46 (83.6)	9 (16.4)
	Ä =10.666, p = 0.014*	

statistically significant

Table 5: Socio-demographics and partners' involvement by buying of medication for the child

Variables	Participation by buying medication for the child Frequency (%)	
	Yes	No
Age of respondents (years)		
= 40	232 (83.8)	45 (16.2)
> 40	95 (84.1)	18 (15.9)
	Ä = 0.006, p = 0.939	
Partners' ethnicity		
Edo indigenes	218 (80.7)	52 (19.3)
Non-Edo indigenes	108 (90.0)	12 (10.0)
	Ä =5.192, p = 0.023*	
Marriage type		
Monogamy	307 (84.3)	57 (15.7)
Polygamy	20 (76.9)	6 (23.1)
	Ä = 0.986, p = 0.321	
Family type		
Nuclear	284 (84.0)	54 (16.0)
Extended	43 (82.7)	9 (17.3)
	Ä = 0.059, p = 0.808	
Partners' level of education		
= Primary	44 (74.6)	15 (25.4)
= Secondary	283 (85.5)	48 (14.5)
	Ä = 4.410, p = 0.036*	
Partners' occupational classification		
Skill level 1	37 (77.1)	11 (22.9)
Skill level 2	163 (83.2)	33 (16.8)
Skill level 3	4 (100.0)	0 (0.0)
Skill level 4	123 (86.6)	19 (13.4)
	Fisher's exact, p = 0.407	
Partners' monthly income (?)		
<10,000	69 (80.2)	17 (19.8)
10,001- 40,000	153 (86.0)	25 (14.0)
40,001- 70,000	54 (76.1)	17 (23.9)
>70,000	51 (92.7)	4 (7.3)
	Ä = 7.797, p = 0.050	

*statistically significant

and healthcare seeking in the hospital when the child is ill were reported by over two-thirds of the respondents. This could be due to the significant role men play in decision making and fulfilment of financial obligation with respect to general household including health needs in the family. This would help provide a healthy nutritional state and immune defence against vaccine-preventable diseases which are major causes of morbidity and mortality in childhood.[26,27] This was similar to reports of the United Nations Development Programme on

assessment of male involvement in antenatal care, birth preparedness, exclusive breastfeeding and immunization of children, which revealed that over half of men encouraged their partners to practice good immunization and exclusive breastfeeding.[28] This may be associated with the high level of education of the spouses of the respondents with 84.8% of them having at least secondary level of education. This high literacy of the males in the study area is documented in the National Demographic and Health Survey 2013[29] and could lead to good knowledge on the importance of involvement in child care activities such as exclusive breast feeding, immunization, and good health seeking behaviour, thus culminating in good practice. Immunizing the child would help prevent vaccine preventable diseases while adequate nutrition would prevent malnutrition and boost immunity of the children, thus leading to a decrease in under five mortality rate, resulting in achievement of Sustainable Development Goal 3.2, which is the eradication of preventable deaths of newborns and children under 5 years of age by 2030.[30]

The healthcare seeking behaviour and use of medication for the child is commendable and similar to findings from a previous survey done in the study locale[31] and could be attributed to the proximity of the area to a tertiary health facility and also presence of numerous private health facilities providing primary care in the study area. Appropriate use of medication would reduce endemic diseases and promote achievement of SDG 3.

Ethnicity, level of education and occupational status of respondent's spouses were significantly associated with the support of exclusive breastfeeding for the child. Indigenes of the state had a better support for exclusive breastfeeding of the child and this is not surprising probably because of the possible role proximity of the family members and relatives might play in the care of the child. Another reason could be the role of the numerous health education campaigns in health facilities and the media, sponsored by various governmental and non-governmental organizations on the beneficial role of breastfeeding to under-5 children.

Participation of the partners in taking their children to the hospital when ill decreased with increase in age of respondents, this association was statistically significant. This could be as a result self perceived increased medical knowledge of couples in the care of their children with much experience from caring for the older children. This may lead to gaps in meeting the health needs of the child, resulting in increase misdiagnosis and poor management of child ailment due to poor health seeking behaviour of the care givers.[2] Partners in monogamous marriages and nuclear families participated more in taking children to hospitals when they are ill. This could be as a result of small household size and better finances which could facilitate participation in childcare activities.

Increased educational and skill levels were also associated with increased partner's involvement in taking child to hospital when ill and also buying medication for their children. This is also related to possible better socio-economic status which would facilitate partners involvement in child health activities by providing funds for out-of-pocket payment for health services which is the major means of healthcare financing in the locality.[18]

In conclusion, respondents in the urban community perceived that their partners play active roles in various childcare activities including child health issues. The socio-economic status of respondents' partners affected their involvement in childcare activities to varying degrees. There should be sustained routine health enlightenment programs facilitated by public and private health agencies in the region, emphasizing the importance of male involvement in childcare activities at the family and community level.

Conflict of interest
Nil.

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Investigation of Urinary Schistosomiasis Among Children in Murbai And Surbai Communities of Ardo-Kola Local Government Area (LGA), Taraba State, Nigeria

Houmsou RS, Hemen A, Binga WE, Bwamto BJ, Une AE & Larit KS

ABSTRACT

Background: Urinary schistosomiasis is a parasitic disease caused by the larval form of blood flukes. It remains a serious public health problem among rural dwellers of sub-Saharan Africa. This cross-sectional study was conducted to determine the prevalence, intensity of infection as well as risk factors associated with the disease among children in Murbai and Surbai communities of Ardo-Kola LGA, Taraba State, Nigeria.

Methods: Urine samples were analysed by the standard filtration technique using 10ml syringe, swinnex polypropylene filter holder (13mm diameter) and polycarbonate membrane filters (12μm porosity). Questionnaires were also administered to children to collect information on socio-demographic data and water contact activities.

Results: A point prevalence of 58.5% (675/1153) was reported out of the urine samples examined. Males were significantly infected than their female counterparts (71.5% vs 43.7%, $\chi^2 = 89.12$, *p=0.000*). The age-related prevalence showed the [6-10] and [11-15] years significantly infected with 78.7% and 73.0% respectively than the [1-5] years age group ($\chi^2 = 89.12$, *p=0.000*). Light intensity of infection (1-49eggs/10ml of urine), 62.5% was significantly higher than the heavy intensity (> 50eggs/10 ml of urine) among the infected children ($\chi^2_= 365.8$, *p=0.000*). Water contact activities such as fishing (OR=4.01, CI=3.04 – 5.61, *p=0.000*), rice farming (OR=4.01, CI=2.96 – 5.36, *p=0.000*) and dry season farming (OR=4.78, CI=3.68 – 6.22, *p=0.000*) were the risk factors exposing children to infection in the area.

Conclusion: There is an urgent need to undertake a large-scale deworming control programme using Praziquantel in the area.

Keywords: *Urinary, Schistosomiasis, Intensity, Risk Factors, Taraba State.*

INTRODUCTION

Human schistosomiasis is a waterborne parasitic infection caused by five species of *Schistosoma* viz *Schistosoma haematobium* (*S. haematobium*), *S. mansoni*, *S. japonicum*, *S. mekongi* and *S. intercalatum*[1]. Worldwide, about 779 million are estimated to be at risk of infection with 249 million infected[2,3]. The heavy burden is carried by sub-Saharan Africa where an estimated 224 million suffer the malignant effects of the disease with an estimated 280, 000 death toll every year mostly among the rural inhabitants[3].

In sub-Saharan Africa, Nigeria carries the heaviest burden with an estimated 29 million cases of infection[4,5]. Both urinary and intestinal schistosomiasis exists in Nigeria[6,7-,9], but urinary schistosomiasis is more widespread than intestinal schistosomiasis with varying prevalence across the country[6,10-15]. The disease is transmitted by the group of planorbid fresh water snails of the genus *Bulinus* found around sources of water such as streams, slow flowing rivers, ponds and irrigation canals where rural inhabitants rely on

for their recreational, occupational, domestic and agricultural activities.

Taraba State is well-known for its diverse relief made of mountainous and plain areas. Many of the plain areas are places of intense agricultural activities surrounded by streams, rivers and ponds where inhabitants depend on daily ignoring the health implications of these water sources. Majority of the indigenous residents in the State depends on agricultural activities such as rice and dry season farming with complete dependence on ponds, streams and rivers. Due to the paucity of information on the distribution of urinary schistosomiasis in the State that will help in planning adequate control programmes, this study was conducted to investigate urinary schistosomiasis in relation to epidemiological factors, as well as associated risk factors that predispose children to infection in two riverine communities (Murbai and Surbai) of Ardo-kola

Local Government Area, Taraba State, Nigeria.

Materials and Methods
Study Area

The study was conducted in Murbai (08°54'N; 11°88'E) and Surbai (08°54'N; 11°15'E) communities of Ardo-kola LGA between January 2015 – March 2015. The area is inhabited mainly by indigenous people "the jukun kona" that are peasant farmers that practice both rainy and dry season farming. The climate of the area is a typical savannah area that is traversed by streams and rivers. There are also several ponds which the inhabitants rely on for their daily chores water activities. The rainy season in the area starts from May to October, while the dry season starts from November to April. The choice of the area was dependent on the presence of streams and ponds in the area coupled with the fact that no epidemiological study was conducted in the area.

Subjects, inclusion and exclusion criteria
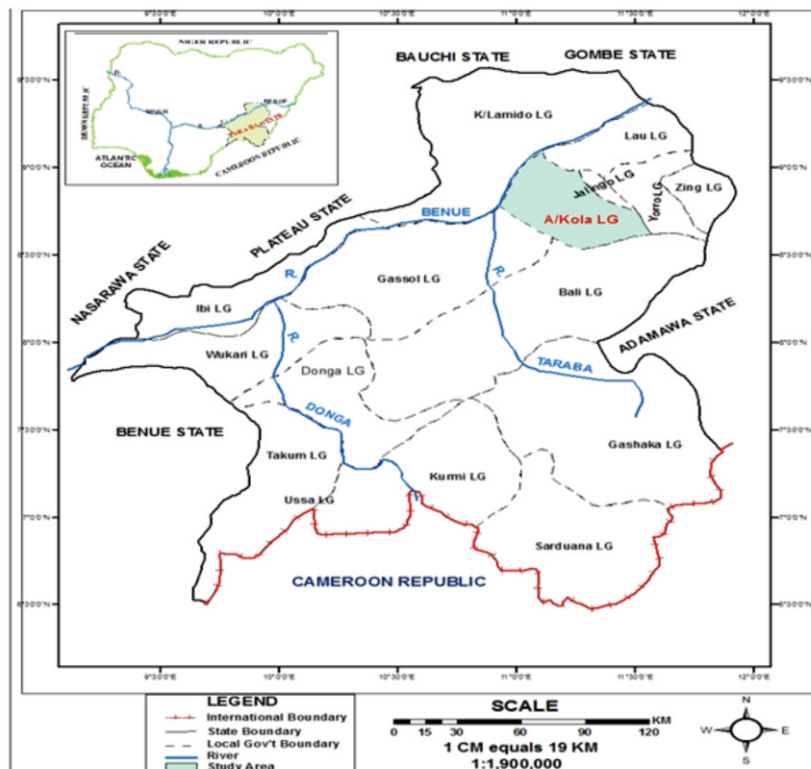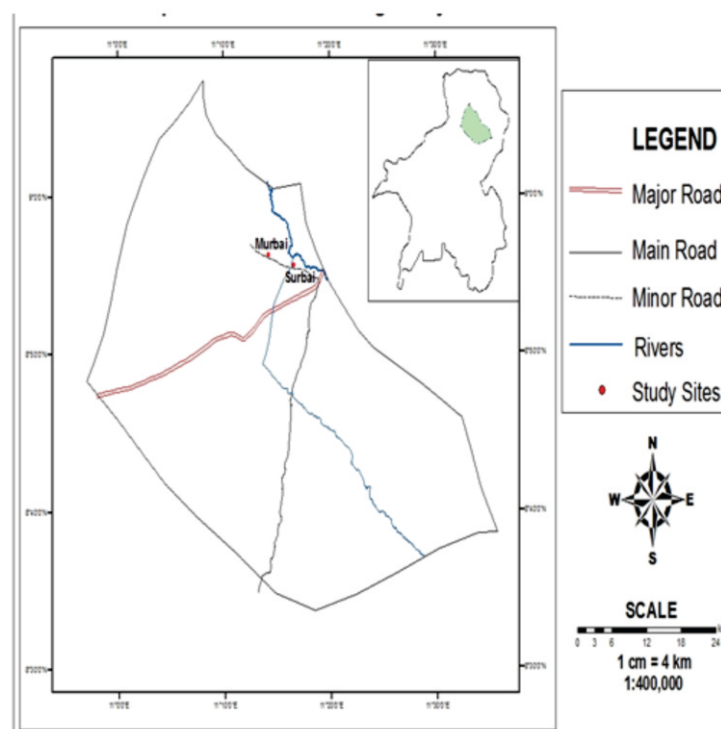
Figure 1: Map of Study Area

The study enrolled pre- and school aged children that were residents of the two communities. All children who consented and whose parents agreed with the terms of the research and gave at least 10 ml of urine specimen were included in the study, while those that were sick and female that were on menstrual period were excluded.

Study design, Sample Size Calculation and Sampling Procedures
The design of the study is cross-sectional in nature cutting across socio-demographic and predisposing factors of the children in the area.
The children population size in each community was calculated using the following formula with 95 % confidence interval[16].

$$N = \frac{Z^2_{\alpha/2*P*(1-P)*D}}{E^2}$$

With, P = assumed prevalence of 40% of urinary schistosomiasis among children in each community
E = Precision (margin error), which is 10% of the assumed prevalence

$Z_{\alpha/2}$ = 1.96, which is the normal deviate for two-tailed alternative hypothesis
D = 1, which is the design effect reflecting the simple random sampling procedure used for children enrolment.

The calculated children population size N was 576. Due to the difference in population size of the communities, 10% of the sample size calculated (58) was required to be added during sampling in Murbai community. After, data collection, these were sorted and we arrived at 541 in Surbai and 612 in Murbai communities respectively.

Questionnaire Administration
Questionnaire was given to each enrolled child to obtain information on some socio-demographic factors such as age, sex, educational level and occupation of parents. Water related activities such as bathing/playing, swimming, fishing, dry season and rice farming were also collected.
Urine Specimen Collection and Laboratory

Investigations

About 20ml of urine was collected from each enrolled child using labelled universal bottles. Specimen were collected between 10:00-14:00 hours of the day, preserved in the cooler using ice pack and transported to the laboratory within 30 minutes.

In the laboratory, urine specimen were processed by the standard filtration technique using 10ml syringe, swinnex polypropylene filter holder (13mm diameter) and polycarbonate membrane filters (12µm porosity) (Sterlitech Corporation, Kent, USA). Positive specimens were reported and classified as light intensity of infection (< 50eggs/10ml of urine) and heavy intensity of infection (> 50 eggs/10ml of urine)[17].

Data Entry and Analysis

Collated data were entered and sorted into Microsoft Excel 2010 and exported into SPSS IBM version 20 for data analysis. Chi-Square (χ^2) test was used to compare infection level as well as intensity of infection between communities, age, sex, educational level and occupation of children parents. Logistic regression was used to assess possible relationship between schistosomiasis level and children predisposing factors. P≤0.05 was used as significance level.

Results

The occurrence of urinary schistosomiasis in relation to age, sex and communities surveyed is shown in Table 1. The overall infection level was 675(58.54%) among the children examined. The infection varied significantly between male, 71.15% (444/624) and female, 43.66% (231/529) ($\chi^2 = 89.12$, *p=0.000*), as well as between age groups with the [6-10], 78.70% (436/554) and [11-15] years, 73.02% (176/241) having the highest level of infection ($\chi^2 = 360.88$; *p=0.000*). Communities related infection reported children in Surbai, 66.72% (361/541) to be more infected than those in Murbai, 51.30% (314/612) ($\chi^2 = 28.13$, *p=0.000*).

Table 2 shows the trend of intensity of *S. haematobium* eggs among the infected children. Light intensity of infection (1-49 eggs/10 ml of urine) (Figure 2), 62.51% (422/675) was significantly reported than heavy intensity of infection (> 50eggs/10 ml of urine) (Figure 3), 37.48% (253/675) ($\chi^2 = 96.99$, *p=0.000*). The sex trend showed that female significantly carried the burden of light intensity of infection (70.12%), while male carried the highest burden of heavy intensity of infection (41.44%) ($\chi^2 = 96.99$; *p=0.000*). The age-related intensity of infection showed that the age group [1-5] years significantly carried the burden of light intensity of infection (85.71%), while the older age group [11-15] years

Table 1: urinary schistosomiasis in relation to communities, age and sex of children

Variables	Examined	Positive	χ^2	P-value
	Urinary schistosomiasis (%)			
Overall	1153	675(58.54)		
Communities			28.13	
Murbai	612	314(51.30)		*0.000*
Surbai	541	361(66.72)		
Sex			89.12	
Male	624	444(71.15)		*0.000*
Female	529	231(43.66)		
Age (years)			360.88	*0.000*
[1-5]	358	63(17.6)		
[6-10]	554	436(78.70)		
[11-15]	241	176(73.02)		

Table 2: Intensity of Schistosoma haematobium eggs among infected children in Murbai and Surbai communities

	Intensity of infection (eggs/10ml of urine)(%)		Total	χ^2	p
	1-49eggs	>50 eggs			
Overall	422(62.51)	253(37.48)	675		
Sex				96.99	*0.000*
Male	260(58.55)	184(41.44)	444		
Female	162(70.12)	69(29.87)	231		
Age(year)				369.69	*0.000*
[1-5]	54(85.71)	9(14.28)	63		
[6-10]	270(61.92)	166(38.07)	436		
[11-15]	98(55.68)	78(44.31)	176		

carried the highest burden of heavy intensity of infection (44.31%) ($\chi^2_{=}$ 369.69; *p=0.000*).

The risk factors exposing the children to urinary schistosomiasis in Murbai and Surbai communities of Taraba State, Nigeria are shown in Table 3. Children involved in dry season farming (irrigation) [71.01%, OR=4.789, C.I (3.685 – 6.224), *p=0.000*] ; Fishing [66.36%, OR=4.013; C.I (3.004 – 5.361), *p=0.000*] and rice farming [66.21%, OR=4.010; C.I(2.996 – 5.368), *p=0.000*] were more exposed to urinary schistosomiasis.

Discussion
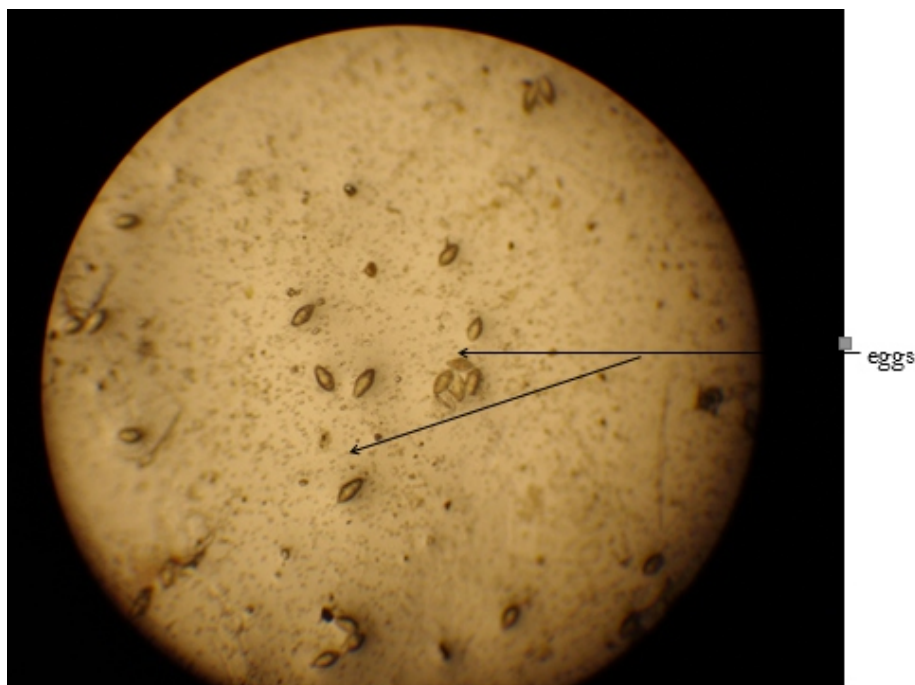
Figure 2: light intensity of infection (1-49 eggs/10ml of urine) (X10 objective) (Field study, 2015)
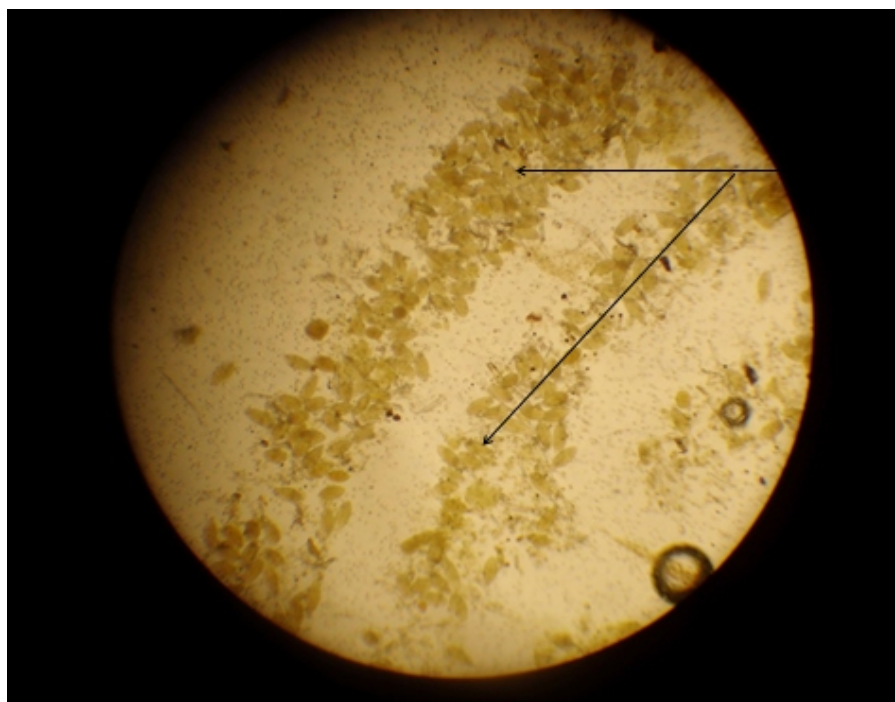
Figure 3: Heavy intensity of infection (> 50 eggs/10 ml of urine) (X10 objective)(Field study, 2015)

Table 3: Risk factors exposing children to urinary schistosomiasis in Murbai and Surbai communities of Taraba State, Nigeria

Variables	Urinary Schistosomiasis (%) Negative	Positive	OR	[C.I, 95%]	P-value
Swimming			0.75	[0.129 – 3.864]	0.685
☐ Yes	476(41.49)	671(58.50)			
☐ No	2(33.33)	4(66.77)			
Fishing			4.013	[3.004 – 5.361]	0.000
☐ Yes	297(33.63)	586(66.36)			
☐ No	181(67.00)	89(33.00)			
Swimming & Fishing			3.286	[2.508 – 4.306]	0.000
☐ Yes					
☐ No	283(33.65)	558(66.35)			
	195(62.50)	117(37.50)			
Rice farming			4.010	[2.996 – 5.368]	0.000
☐ Yes	300(33.78)	588(66.21)			
☐ No	178(67.16)	87(32.83)			
Dry season farming (Irrigation)			4.789	[3.685 – 6.224]	0.000
☐ Yes	222(28.98)	544(71.01)			
☐ No	256(66.14)	131(33.85)			

Schistosomiasis has received little attention than other neglected tropical diseases in Nigeria just because the disease does not cause immediate chronic effects on the infected individuals. All these years, efforts made to control the disease has not shown significant reduction in the prevalence and still living millions of people despaired and suffering from the adverse effects of the disease. The overall infection level (58.54%) reported in this present study showed high endemicity of urinary schistosomiasis in the area when compared to World Health Organization cut-off standards[17]. This shows the lack of effective control programmes in the area despite the global efforts to control the disease in endemic areas of sub-Saharan Africa. The hyper-endemicity of the disease in the two communities is the results of the intensified water related activities through the observed daily chores activities of the inhabitants such as washing of utensils, bathing and swimming. Irrigation and rice farming were also the main agricultural activities of the inhabitants during the period under study. These communities rely on the streams and they are completely deprived from potable water despite their proximities to the Taraba State capital, Jalingo. Urinary schistosomiasis hyper-endemicity reported in this study corroborates findings reported in other parts of rural Nigeria: 55.0% in some rural areas of Guma LGA, Benue State[11]; 53.8% in some rural areas of Abia State[12]; 58.1% in a rural community near Abeokuta, Ogun State[13]; 61.5% in communities living around the Erinle and Eko-Ende dams, Osun State[18]. The hyper-endemicity in all these communities reflects the common behavioural water contact activities of the inhabitants either through their daily chores or recreational activities and agricultural engagements. This is pertinent because even if preventive chemotherapy is administered to all village dwellers but when there is no provision of potable water for people to reduce contact with cercariae infested water bodies the communities would still remain exposed to infection. The present finding contrasts report of the Federal Ministry of Health which found low endemicity of schistosomiasis (5.6%) in nine LGAs of

Taraba State[19]. Schistosomiasis infection level in the present study was significantly higher than findings in other parts of the State, 10.1% and 15.5% in Gashaka and Bali LGAs respectively[6,20], as well as 15.3% in a rural community of southwestern Ebonyi State[21] and 8.3% among Hausa communities of five LGAs in Kano State[22]. The infection level found in this study is also higher than 49.0% and 44.3% reported in Biase, Cross-River State[23] and Toto LGA, Nasarawa State[24] respectively, which are both neighbouring States to Taraba State.

Compared to other rural areas of African countries, the infection level reported in this study is similar to those reported in Senegal and Sudan[25,26]; but higher than reports from Ethiopia[27]. Most children had light intensity of infection, but this was higher among females and children aged 1-10 years. A fewer portion of the children carried the burden of heavy intensity of infection in the area with male and children aged 11-15 years mostly affected. This seems to be the trend in most urinary schistosomiasis affected areas and it has not been clearly understood in most studies living insinuation among researchers whether the occurrence of light and heavy intensities of infection depends on the children immune system build-up or the frequency of their water contact activities with cercariae infested water bodies. Such trend has been reported in Nigeria, as well as other endemic countries with no clear explanation[10,11,19,28,29].

Activities such as fishing, rice and dry season farming seem to predispose children to infection in the area. These activities are the mainstay and are found as a norm in most Nigerian rural population where there is no safe recreational and potable water and where people live on subsistence irrigation farming. This corroborates previous studies that reported the role of poor socio-economic background, occupational (fishing and farming) and recreational activities (swimming, playing and laundry) activities in water sources around villages to be major contributing factors to schistosomiasis hyper-endemicity in communities[3,30].

In conclusion, this current study reported a new schistosomiasis hyper-endemic focus that will be

added to the baseline data which will help in planning future control strategies. Male children were more infected than their female counterparts. Majority of the children were burdened with light intensity of infection which was found highest among the female and children aged 1-10 years. Activities like fishing, rice farming and dry season farming were the predisposing risk factors of children to infection.

Though urine filtration using polycarbonate membrane filters is the standard field technique for *S. haematobium* eggs recovery, this study had a major limitation which is the single screening of urine specimen from the children. The collection of at least two urine samples on two consecutive days from the children examined would have optimized the recovery of eggs from filters and better estimated the infection level therefore reflecting the true prevalence in both areas.

Authors' contribution
HRS, AH, AEU and **KSL** conceived and designed the study. HRS carried out statistical analyses and drafted the paper. WBE carried out literature searches and laboratory examination.

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Intestinal Helminthes Infection in Pregnant Women at First Antenatal Booking Visit at The University of Calabar Teaching Hospital, Calabar, Nigeria

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ABSTRACT

Background: Intestinal helminthes infections are a cause of chronic blood loss and anaemia in pregnancy in sub-Saharan Africa.

Objective: To determine the prevalence and type of intestinal helminthes infection in pregnant women at the first antenatal booking visit at the University of Calabar Teaching Hospital, Calabar, Nigeria.

Methodology: This was a descriptive cross-sectional study of two hundred and fifty (250) first antenatal booking visit patients. A structured interviewer- administered questionnaire was used to extract socio-demographic and obstetric information. Stool samples were collected using Screw-capped bottles and spatula and subjected to parasitological examination. Data analysis was done using SPSS version 16. Associations between variables were determined using Chi-square test. A p-value <0.05 was considered significant.

Results: Twenty five (25) Of the 250 participants, had intestinal helminthes infection giving a prevalence of 10%. *Ascaris lumbricoides* was the commonest (64%) while *ancylostoma duodenale* was the rarest. Women who used untreated stream/river and borehole water were significantly more likely to be infested compared with women who used pipe-borne water, bottle or sachet water (x^2= 37.738, p =0.0001). However, frequent ingestion of food prepared by vendors compared to home-made food did not significantly increase the risk of worm infestation. (x^2= 1.476, p=0.6878). Antihelminthic usage significantly reduced infestation rates (x^2= 4.258, p=0.039).

Conclusion: The prevalence of intestinal helminthes (Nematode) infection of 10% is significant. Access to safe drinking water in communities is an important step in preventing helminthiasis.

Keyword: *Intestinal nematode parasites, antenatal care, Calabar, Nigeria*

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INTRODUCTION

It is estimated that over 1000 million people worldwide are infected with nematode.[1,2] Nematodes thrive best in poor communities including tropical Africa, where poor water supply and sanitation abound. Two decades ago Fleming[3] had identified hook worm infection as a major cause of chronic anaemia in Africa, especially in the belt stretching from Cameroon to Zambia. Another study in Ghana, West Africa[4] showed that the presence of hook worm alone in stool was associated with higher risk of low hemoglobin in the last trimester of pregnancy.

Intestinal parasitic infections are common in Nigeria and are of great importance because of high rates of morbidity associated with them. [5] The burden is more on children and pregnant women because of increased requirement for macro and micro nutrients by these group for growth and development. Adult women in their reproductive lives in endemic areas bear a great burden of the consequences of nematode infection. A study in Enugu[6] in pregnant women population recently showed a prevalence of 11.8% for intestinal nematodes, while a similar study in Ghana[4] showed an equally high rate.

Hospital based study in Nepal[7] in 2001 showed that 47% off all anaemic pregnant women had helminthes infection. These figures tend to imply that the conditions that pre-disposed to devastating helminthes epidemics in Europe and North America in early 1999s are still prevalent in some of our communities today.[8]

Previous studies have shown that helminthiasis in pregnancy was associated with poor perinatal outcome including low birth weight, hyperbilirubinemia and perinatal death.[7,8] These adverse outcomes can be averted if conscientious effort is directed towards examining pregnant women's stool at first antenatal visit and treatment given promptly to those diagnosed after the first trimester as recommended by the World Health Organization.[9,10]

Some researchers recently confirmed reasonable correlation between water supply, toilet facilities, sewage disposal, environmental sanitation and transmission of intestinal nematodes[11,12]. Bello et al[11] in a two year review of intestinal parasites among participants at Jos University Teaching Hospital, Jos, Nigeria, attributed the high prevalence observed to crude farming, poor sanitary condition; lack of personal hygiene and low economic status in the majority of inhabitants. Onyemelukwe and Ibe[12] who worked on prevalence of intestinal parasites among food handlers in Enugu, Nigeria revealed that of the 350 faecal examinations conducted, 3.1% had Entamoeba histolytica, 4.9% had Ascaris lumbricoides, 2.3% had ancylostoma duodenale and 0.6% had taenia species. Ejezie and Akpan[13] explained that the high prevalence of Intestinal parasites in general population in Calabar, Nigeria is due to indiscriminate defecation, continuous contact with the soil and tendency to consume food from street hawkers.

Intestinal helminths infections are preventable and curable[14]. The required drugs are cheap, available and safe in pregnancy after the first trimester. Interventional study[15] has suggested that even relatively light hookworm infection may decrease fetal growth and weight gain. It is in recognition of these facts that the Federal Ministry of Health of Nigeria identified eradication of helminthes as a component of focused antenatal care.[15] The World Health Organization also emphasizes that epidemiological studies should be conducted to ensure an up to date information on the prevalence of helminthes before institution of appropriate measures where necessary.[14]

Therefore, this study aims to determine the prevalence of this intestinal helminthic infection among Antenatal care(ANC) attendees in their first visit to the University of Calabar Teaching Hospital, Calabar, a tertiary health facility in the South-South geopolitical zone of Nigeria.

Methodology
Study Setting
The study was conducted at the University of Calabar Teaching Hospital in Cross River State in the South-South geopolitical zone of Nigeria. It is the only tertiary hospital in Cross River State and caters for many obstetric patients in Cross River. The hospital attends to approximately two thousand, five hundred (2500) ANC patients annually with about 30% being first time booking visits patients and conducts more than two thousand (2,000) deliveries annually. The region is characterized by heavy rainfall, especially during the period of this study (June 1st - December 31, 2012).

Study Design/Population
This is a descriptive cross-sectional study of two hundred and fifty (250) consenting ANC first booking patients conducted over a six month period (June 1st - December 31st, 2012). A structured interviewer- administered questionnaire was used to obtain socio-demographic and obstetric information from consenting participants. Thereafter, their stool samples were collected and analyzed for the presence of helminthes; and their blood samples were subjected to haematocrits estimation at the pathology laboratory of UCTH. The minimum sample size of 200 for this study was calculated using the formula. $n= (z^2pq)/(d^2$ (single proportion) where z is Za = standard deviate, a value at 95% confidence interval (=1.98t.test), p is prevalence of presence of the condition from a

previous study (11%), q is probability of absence of the condition (1-p), and d is precision at 5%.

Procedure

All consenting pregnant women who came to book for ante-natal care, within the study period were recruited into the study. General group counseling was offered in the first instance and enrolment solicited. Individual counseling was also offered to ensure each participant was well informed before a signed consent of voluntary participation was obtained. Those excluded from the study were women who have had antihelminthics in the last six months and those who voluntarily declined participation. Confidentiality of information and results was emphasized and ensured throughout the study. After obtaining consent, the participants were given screw-capped bottles and spatulas to collect stool samples at home on the morning of their next clinic visit. The stool samples were delivered within four hours of collection to the antenatal clinic on the second visit. The stool samples were examined for the presence of helminthes at the parasitology laboratory of UCTH using the Direct Smear method (wet preparation) and concentration technique. Participants also had their blood samples collected for haematocrit estimation conducted at the haematology laboratory of the same hospital. Ethical approval was sought for and obtained from the Health Research Ethics Committee of the University of Calabar Teaching Hospital before data collection was commenced.

Data Analysis

Data collected were cleaned and analyzed using SPSS version 16 (IMB inc. Chicago, Il. USA). Associations between variables were determined using the Chi-square test (with Fisher Exact where applicable). Results were displayed in Tables below. A p-value of <0.05 was considered significant.

Limitations

This study relied partly on information from the participants. It is possible that important information might not have been volunteered. Trained assistants were engaged to interpret the questionnaire in local language where there was a language barrier. Also laboratory errors were minimized by engaging the services of an experienced parasitologist.

Results

The age range of participants and mean maternal age were 14-44 years and 27.7±1.24 years respectively. The median age lies between the 26 and 30 age groups. The participants' occupations were trading (24.8%), Government employees (22.0%), students (20.4%), and full time housewives (12.8%). And the remaining 20% consisted of other occupations like hairstylist, seamstresses, gardening and cleaners **(Table1).**

Table 1: Socio Demographic Characteristic of The Women

Variables	No of women	Percentage (%)
AGE	n = 250	%
14-20	28	11.2
21-25	56	22.5
26-30	83	33.2
31-35	63	25.5
>35	20	8
Total	250	100
Occupation	n =250	
Traders	62	24.8%
Government employees	55	22.0%
Students	51	20.4%
Full time house wives	32	12.8%
Others	50	20.0%
Total	**250**	**100**
Educational Status	**n=250**	
Graduates	72	28.8
Undergraduates	33	13.2
Secondary School Leavers	110	44.0
Primary School Leavers	26	10.4
No Formal Education	8	4.6
Total	**250**	**100**

Table 2: Prevalence of nematode infection (species) in pregnant women at first antenatal booking visit

No positive for Ascaris lumbricoides	No positive for Necator americanus	No positive for Necator and Ascaris (mixed)	No positive for ancylostoma
16	4	3	2
64.0%	16.0%	12.0%	8.0%

The prevalence of nematode infestation in pregnant women at first antenatal booking visit was 10.0% (Table 2). Of the 25 women infested, 16 (64.0%) had *Ascaris lumbricoides,* 4(16.0%) had *Necator americanus, and* 2(8.0%) had *Ancylostoma duodenale.* Mixed infection of *Ascaris lumbricoides* and *Necator americanus* accounted for 12.0% of those infected. The association between educational status, hand washing, source of drinking water, eating food from hawkers, faecal waste disposal method, antihelminthic ingestion and helminthes infestation is shown in **table 3.** Of the 25 pregnant women infested, 6 (24%), had post-secondary school education while 19 (76%), had secondary school education or less and this difference was statistically significant ($x^{2=}$4.683, p=0.030).

A total of six participants admitted that they do not routinely wash their hands after defaecation, however, none of these were infested. Six out of sixty four who routinely wash their hands with soap after defaecation were infested, while nineteen of those who said they do not wash their hands routinely with soap after defaecation were infested. However, this was not statistically significant (x =0.756, p=0.685).

In bivariate analysis, the association between the source of drinking water and helminthic infestation shows a significant relationship (x^2=37.738, p<0.001). Twelve (6.6%) of the 183 women who drank mainly from boreholes, 4 (66.7%) of 6 women who drank from streams/river, 6 (10.7%) of 56 women who drank from pipe-borne waters, and 3 (60.0%) of the 5 women who drank from underground well were infested.

There was no significant relationship between the frequency of eating food from hawkers and helminthic infestation (x^2=1.476, p=0.6878). About 10 (9.6%), 10.2% and 7.7% of women who patronized food hawkers on daily, weekly and monthly basis were infested. However, 5 (15.6%) of the 32 women who never patronized food hawkers in the last two years were infested.

One (20.0%) of the 5 respondents who use the pit toilet and open (Bush) places for their faecal waste disposal was infested. Seven (11.5%) who use pit toilet only and 17 (9.3%) who use the water closet were infested. However, there was no significant association between infestation and these method of faecal disposal (X^2=1.013,p=0.7981).

There was a significant association between antihelminthic ingestion and infestation (x = 4.258, p=0.039). There were no infestations recorded among those who took the medications three monthly and six monthly while, 1 (1.6%) of the 38 who took drugs yearly and 24 (15.0%) of the 160 persons who had not taken the drugs for greater than two years were infested. There was statistically significant relationship between anaemic morbidity and worm infestation(table 4). However, age and parity did not significantly influence the prevalence of anaemia in this study as shown in table 5.

Discussion
The public health impact of helminthic infections has been consistently under estimated because of low mortality associated with the infection. Man is the reservoir of most of the intestinal infections. Therefore, if proper control is introduced and sustained, many, if not all will be eradicated. The

Table 3: Association of Educational Status, Hand Washing, Source of Drinking Water, Eating Food From Hawkers, Faecal Disposal And Antihelmintic Ingestion with Nematode Infestation

Variable				Statistics
Educational Attainment	Yes	No	Total	
Post Secondary	6 (5.4%)	105	111	
Secondary or Less	19 (13.7%)	120	139	
Total	*25*	*225*	*250*	X^2=4.683, p=0.030
Hand Washing				
No Routine hand washing	0 (0%)	6	6	
Routine hand washing with soap	6 (9.4%)	58	64	
Routine hand washing without soap	19 (10.6%)	161	180	
Total	25	225	250	X^2=0.756, p=0.6852
Source of Drinking Water				
Borehole	12 (6.6%)	171	183	
Stream/River	4 (66.7%)	2	6	
Tape Water	6 (10.7%)	50	56	
Well	3 (60.0%)	2	5	
Total	25	225	250	X^2=37.738, p<0.001
Eating Food From Hawkers				
Daily	10 (9.6%)	104	114	
Weekly	8 (10.2%)	70	78	
Monthly	2 (7.7%)	24	26	
Never in 2 years	5 (15.6%)	27	32	
Total	25	225	250	X^2=1.476,p=0.6878
Method of Faecal Disposal				
Pit toilet + Bush	1 (20.0%)	4	5	
Bush only	0 (0.0%)	2	2	
Pit toilet only	7(11.5%)	54	61	
Water closet	17 (9.3%)	165	182	
Total	25	225	250	X^2=1.013, p=0.7981
Antihelmintic Medication				
3 – Monthly	0 (0.0%)	29	29	
6 – Monthly	0 (0.0%)	23	23	
Yearly	1 (1.6%)	37	38	
None in > 2 years	24 (15.0%)	136	160	
Total	25	225	250	X^2=4.258, p=0.039

Table 4 : The Association Between Infestation And Anaemia

Nematode infection	No. Examined	No. Infected + anaemia	% Age of infected & with anaemia
Clients infected	25	19	60.0
Clients not infected	225	77	34.2
Overall	250	96	38.4

Table 5: Association of Anaemia With Maternal Age and Parity

Maternal age (years)	No. Examined	No. With Anaemia	% with anaemia in each group
14-25	89	41	46
26-35	138	48	34
>35	20	6	30
TOTAL	250	95	38

$$X^2 = 3.57, p = 0.16$$

Parity		No. With anaemia	% Anaemic per parity
0	105	42	40.0
1+2	93	30	32.2
>3	52	22	42.3
TOTAL	250	96	39

overall prevalence of 10% helminthic infection amongst pregnant women at first ante natal care visit in this study is higher than that reported from a similar research in the Sekyere West District in Ghana.[4] It is however lower than figures from Enugu, Nigeria[6] and Nepal[7]. It is also lower than the 28.5% recorded among the general population in Calabar[10].

The World Health Organization (WHO) noted that parasitic diseases are a reflection of environmental conditions since a high index of intestinal parasites is an indication of deficiencies in sanitation, standard of living and habits of cleanliness.[14] This study revealed high personal hygiene and cleanliness among the participants (73% used water closet toilets, while 92.6% routinely practice hand washing after defecation). Calabar metropolis has good distribution of treated public water supply; hence 95% of the subjects obtain their drinking water from taps and /or boreholes. The last decade had witnessed an unprecedented improvement in areas of housing, social amenities such as pipe-borne water, drainage system and general environmental sanitary condition with an efficient and enhanced waste disposal arrangement. These measures may be the reasons for the low prevalence of helminthes infection in this study. It is not surprising, therefore, that the source of drinking water was significantly associated with infestation. This association is consistent with findings from other studies [2,4,6]. However, educational status and occupation had no statistically significant association with the prevalence of helminthes infection. These findings are similar to that of other studies in Nigeria[8].

This lack of association between social class or educational status and prevalence of helminthes infection among the study participants may be

due to the fact that this study was conducted among antenatal attendees who might have been educated through antenatal classes on the need to practice good personal hygiene like proper hand washing after defecation and before or after handling food irrespective of their social status.

The most prevalent specie was *Ascaris Lumbricoides* This was followed by *Necator americanus* and then mixed infection of *Ascaris lumbricoides* and *Necator americanus*. This specie prevalence of helminthic infections is similar to a previous study in a city of South-East Nigeria[6,8] This similarity may be due to the mode of infections of the parasites. For instance *Ascaris lumbricoides* eggs may easily contaminate foods like fruits or vegetable and if not cooked properly may infect the host/human. Other species like hookworms require penetration of the lavae through the skin of the host as such regular wearing of shoes may reduce its infectivity.

This study recorded a high proportion of participants who eat food purchased from hawkers. Although the association did not show any statistical significance in this study (P=0.26), the high proportion of pregnant women eating from food hawkers is of serious public health concern. This is because most of the foods hawked are prepared in an unhygienic environment and the source of water used for the food preparation may not be clean.

The Federal Ministry of Health in Nigeria had recommended and declared treatment of helminthes as a component of focused antenatal care. Mebendazole is recommended to be given to pregnant women in the 2nd or 3rd trimester when necessary [15]

Conclusion

The prevalence of intestinal helminthes in this study is relatively low but still significant. With co - infestatation with other parasitic infections like malaria it may have grave consequence not only on the unborn child but also on the pregnant mother. It is therefore important that a holistic approach of investigating and treating these parasitic infections during pregnancy be instituted as a component of antenatal care especially in areas of high prevalence.

Disclosure
The authors report no conflict of interest in this work.

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Supplementary to AJTMBR Vol. 3 No. 2

Table of content

A Study on the Management and Perinatal Outcome of Preterm Prelabour Rupture of Membranes at Delta State University Teaching Hospital, Oghara.

Onohwakpor EA; Aramabi E,

ABSTRACT

Background

Preterm Prelabour Rupture of Fetal Membranes and its management is a significant burden in obstetrics, occurring in 2–3% of all pregnancies and leading to 30–40% of preterm births. It is therefore a significant risk factor for perinatal morbidity and mortality arising from its association with fetal prematurity. The aim of this study was to review the management and perinatal outcome of PPROM in Delta State University Hospital, Oghara.

Methods

This was a descriptive retrospective study conducted in the Department of Obstetrics and Gynaecology, Delta State University Teaching Hospital from January 2011 to December 2015. The study included 80 pregnant patients presenting with Preterm prelabour rupture of membranes between 28 to 36weeks+6days.

Results

The prevalence of PPROM was 5.7%. Majority of the women were aged between 30-34 and $\geq$35 years and the mean parity was 1.48$\pm$1.55. 37% of the patients presented between 28-31 weeks. No apparent risk factor for PPROM was identified in 26% of the patients. 43% had vaginal delivery and mean birthweight of the babies was 1.53$\pm$0.52kg. Majority of the preterm neonates had first and fifth minute Apgar scores greater than 7. Perinatal mortality was 18.8% in this study.

Conclusion

Premature Prelabour Rupture of Membrane is associated with poor fetal outcomes arising from the problems of prematurity and neonatal sepsis. A clear understanding of its consequences is essential in providing adequate interventions needed in the prevention of unfavourable perinatal outcomes.

A Ten-year Review of Morbidity And Mortality Following Abdominal Myomectomy at The University of Port Harcourt Teaching Hospital.

Eli S[1,2], Kalio DGB[3], Abam DS[2], Nonye-Enyida[3], Pepple DKO[3], Ikimalo J[2]

ABSTRACT

Background

Uterine leiomyomas also referred to as uterine fibroids are among one of the most common problems encountered by obstetrician/gynaecologist. The removal of these myomas with the reconstruction and preservation of the uterus may be complicated by morbidities and in rare occasions mortalities.

Aim

To evaluate complications following abdominal myomectomy and offer preventive measures.

Method

This was a 10-year retrospective study on the presentation of all cases of uterine fibroids admitted into the gynaecological ward of the University of Port Harcourt Teaching Hospital. The information was coded and analysed using SPSS version 20.

Results

Uterine fibroid accounted for 523(12.2%) % of the 4287 gynaecological admissions during the period under review. The modal age was 33 years. Abdominal myomectomy was done for 273 (61%) and polypectomy for 9 (2%) of the subjects. The three most common morbidities were anaemia 95 (35%), pyrexia 60 (22%) and wound infection 33 (12.2%). Three (1%) died post – operatively resulting from uncorrected intra-operative anaemia for haemorrhage.

Conclusion

The study revealed that anaemia was the commonest morbidity following abdominal myomectomy and the mortality following the afore mentioned surgery was only 1%. There is need to optimize patient prior to surgery and apply measures to reduce blood loss in other to have a favourable outcome.

Correlation of Renal Ultrasonographic Parameters with Serum Creatinine in Patients with Chronic Kidney Disease.

Ogochukwu CA Okoye [1]; Joyce E Ikubor [2]

ABSTRACT

Background

Renal ultrasound is used to determine the size, location, architecture of the kidneys, and to exclude obstruction. Echogenic kidneys and renal size may indicate the presence of renal parenchymal disease. Some authors have reported a significant correlation between renal echogenicity and renal function.

Methods

A retrospective cross-sectional study carried out in a Tertiary Hospital in Southern Nigeria, using records of CKD patients seen in the renal outpatient clinic. All adults diagnosed with CKD according to KDIGO definition were included; but patients with advanced cystic kidney disease, hydronephrosis, and fatty liver or other liver diseases diagnosed on ultrasonography, were excluded. A data sheet was used to collect information regarding patient's age, sex, anthropometry, aetiology of CKD, and serum creatinine. Glomerular filtration rate was estimated using CKD-EPI calculator. Information on ultrasonographic parameters such as renal length, renal echogenicity, corticomedullary differentiation, were obtained from patient's records and the radiology database.

Results

Out of 102 CKD patients studied, 8.8% had grade 1 echogenicity, while 50% had grade 4. The overall mean serum creatinine was 7.8 3.5 mg/dl, it was highest among grade 4 group compared to other grades. Serum creatinine increased as grade of renal echogenicity increased ($F=4.059$, $P= <0.001$). Renal echogenicity was predictive of serum creatinine ($B=2.421$, $CI=1.800$-3.042, $p=<0.001$). There was a significant negative correlation between left kidney length and serum creatinine ($r= -0.235$, $p=0.018$), but there was no correlation between kidney length and grade of echogenicity

Conclusion

Renal echogenicity correlates better with serum creatinine than kidney length in adults CKD patients. The implication of this is that renal ultrasound scan would be a useful bedside technique in renal outpatient clinics and emergencies, to quickly identify presence and severity of renal disease.

Scarcity of Haematologists in Nigeria: Unfriendly Specialty Among DELSU Medical Students

Nwagu Marcellinus Uchechukwu

ABSTRACT

Background: There is continuous rise in haematology and haemato-oncology cases in Nigeria. Unfortunately, there is inadequate number of haematologists to care for these rising cases despite the high number of medical doctors being churned out by over twenty medical schools in Nigeria.

Objective: The aim of this study is to find out the preference rate of Haematology among medical students in a typical Nigerian medical school.

Methodology: Questionnaires were used to collect data from medical students who met the inclusion criteria. The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) software version 22. Results were presented in Frequency distribution tables and pie charts.

Results: Three hundred and thirty-one students were interviewed. The mean age was 23.47±3.92 years. Male medical students were more than the females: 193(62.1%) versus 118(37.9%), respectively, giving a male to female ratio of 1.63:1. Urhobo, 144(46.3%) and Igbo, 67(21.5%) were the two major tribes of the students. Others were the Isokos 31(10%), the Ukwuanis, 16(5.1%), and the Binis 11(3.5%). One hundred and eighty-two students (58.5%) attended private schools, 116(37.3%) attended public schools while the remaining 13 students (4.2%) attended the mission schools. Two hundred and eighty-two students (91%) said they would specialize while the remaining 29(9%) said they will not specialize after graduation. Surgery was the most preferred choice (23.5%), followed by Obstetrics and Gynecology (13.2%), Internal Medicine (11.9%), Family Medicine (10.9%) and Paediatrics (9.0%). Twelve-point nine percent of the students have not decided which specialty they would choose. The choice to specialize in Haematology was 1.9%.

Conclusion: This study showed that the preference of haematology as a specialty for specialization was abysmally too low. Haematology should be made to be more interesting and appealing to the students. There is need for re-structuring and re-organization of the medical training to increase the student-patient interaction during the students' postings in haematology