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CONTENT

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Author Guideline

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The following contributions are accepted (word counts exclude abstract, tables and references):

1. Original research (Between 1000 and 3500 words).
2. Letters to the editor (Up to 400 words).
3. Scientific letters (Less than 600 words); one table or graph and not more than 5 references.

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Acknowledgments

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

References

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

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

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The following are sample references:

Standard journal article

List first authors:

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

More than six authors:

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

Books and other monographs:

Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical Microbiology. 4th ed. St Louis: Mosby; 2002.

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

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

Chapter in a Book:

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

Dissertation

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

Worldwide Web (www)

Dushay J, Abrahamson MJ. Insulin Resistance and Type 2 Diabetes; A Comprehensive Review. Available at http://www.medscape.com/viewarticles/501569 (accessed 20 July, 2007)

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Authors must declare all financial contributions to their work or other forms of conflict of interest, which may prevent them from executing and publishing unbiased research. Conflict of interest

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LETTER FROM THE EDITOR

I welcome you to this edition of the Jos Journal of Medicine with great pleasure. Our constant aim has always been to attract quality articles that extend the frontiers of medical science and to disseminate the findings of original research to a worldwide audience.

I greatly appreciate the members of the Editorial Team and our invaluable Editorial Advisors. Your selfless, patient, consistent and timely support continues to better our serve.

In the current year of service, we have continued to consolidate effort toward turning the attention of our members to the crucial area of research and publication. We hope that the rise in the number of resident-driven works will continue and increase. May I thank the Terna Aule-led executive for navigating the association even through turbulent times to the present peace we now enjoy. May our Association continue on to greater heights.

We must also appreciate our esteemed authors and you, our readers, for your high regard and interest in our journal. The size and diversity of this current volume remains a testament of our reach and relevance made possible by our great audience.

Finally, our journal remains indexed in the African Journal Online (AJOL) and authors are encouraged to send their articles and other correspondences as necessary via the email; editorjjm@gmail.com.
Thank you as always for choosing the Jos Journal of Medicine and please enjoy the read!

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CONTENT

VIEWS OF EARLY CAREER DOCTORS ON RESIDENCY TRAINING AND CLINICAL PRACTICE IN NIGERIA: A QUALITATIVE REPORT FROM CHARTING STUDY

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Abstract

In Nigeria, Early Career Doctors (ECDs) constitute a significant number of the doctor's health workforce and play a crucial role in health service delivery. However, there is a paucity of data concerning attitude, perception, and challenges in training and skill acquisition faced by ECDs undergoing residency training in Nigeria. This study is a component of Challenges of Residency training and early career doctors in Nigeria (CHARTING study) a multicentre and multidisciplinary study that explored the views of ECDs on residency training and clinical practice in Nigeria.

Methods

Focus Group Discussions (FGD) were conducted among fourteen respondents, to address specific aspects of the residency training program and encourage respondents to express themselves about issues relevant to their personal experiences as regards the assessment of practice and proffer recommendations. Discussions were digitally recorded with an audio recorder. Audio-recordings was transcribed verbatim. Transcripts were analysed, and coding was done using NVivo 12 program.

Results

All the study participants expressed various degrees of dissatisfaction and challenges such as lack of up to date knowledge, poor&contingent rewards, workload distribution, lack of mentorship, and unequipped facility during the residency training program. Majority of the study participants considered the program is currently skewed towards service delivery at the detriment of training and research.

Conclusion

The study provided robust information on the knowledge of the trainees' perception of the residency training program in Nigeria as well as the challenges of residency training among ECDs as regards their experience and practice; it also proffered recommendations to mitigate the challenges.

Keywords: Career, Internship, Postgraduate, Registrar, Trainee, Residency, Doctors, Dentist, Early Career Doctors, Nigeria, Education, Graduate Medical, Residency

Introduction

Early Career Doctors (ECDs) constitute a significant proportion of health workforce in Nigeria and entails medical & dental intern, resident doctors and medical officers in the rank of medical officer and senior medical officer in Nigeria.[1-3]. Globally, ECDs also constitute a significant fraction of the doctor's health workforce and play a crucial role in health service delivery. ECDs also constitute a significant proportion of medical and dental practitioners in Nigeria.

The ECDs are particularly unique as they occupy a unique career phase which is no doubt stressful, often an intensive training period.[4,5]Furthermore, as

they will eventually metamorphose into medical experts, leaders and trainers, it is vital to get interested in them and understand their views about their training and clinical practice during their training programme in the country.

There is, however, a dearth of research on ECDs in Nigeria – with little information available about the perception, attitude and the challenges in training experienced by these young professionals.The few available studies were mainly quantitative studies that used structured questionnaires to assess the information concerning ECDs. The studies may thus, be limited in their ability to collect information with depth which is possible with qualitative study designs. This study, therefore, explored the views of ECDs on residency training and clinical practice in Nigeria. This will provide insight into ECDs in Residency programme in Nigeria. Other reports on other themes collected from the same study population are in the process of being published from the same subset of study.

METHOD

We conducted two sessions of Focus Group Discussions (FGD) among 14 respondents. The sample size was limited to 2 geo-political zones of the country due to the accessibility and availability of participants. However, the study population share closely related characteristics.We used a purposive sampling method of ECDs in eight training institutions in Nigeria. The FGD guide was designed and carefully reviewed by the FGD team in a logical sequence to address topics related to the research objective. This study is a component of mixed study design of Challenges of Residency training and early career doctors in Nigeria (CHARTING) study, which is a cross-sectional, multicentre, multi-disciplinary and multi-dimensional study of ECDs in Nigeria.[4,6]

Data collection

The FGD was conducted during two official gatherings of Nigerian Association of Resident Doctors(NARD) formerly referred to as National Association of Resident Doctors of Nigeria(NARD), where key members and leaders of each branch come around for the meeting. Statutorily, the National Executive Committee, National Executive Council, and Expanded National Executive Council attend these meetings although other delegates who are members but non-NEC members may also attend.[7]

Voluntary respondents who were various branch leaders and delegates were recruited into the study. A formal request for participants in the study was made in the meeting, and interested individuals were recruited.

We utilised two trained facilitators to collect data, and the sessions lasted for about 1 to 1 hour 30 minutes secluded from the central meeting. The facilitators used a semi-structured FGD guide which was carefully designed to address specific aspects of the residency training program and encouraged respondents also to express themselves about issues relevant to their personal experiences as regards the assessment of practice and proffer recommendations.

Discussions were digitally recorded with the use of an audio recorder (Sony ICD-PX470 Digital Voice Recorder) while a smartphone audio recorder was used as a backup/ alternate plan with participant consent to ensure that the details of the conversations are adequately captured. Two sessions were conducted, and it continued until data saturation(all the questions in the FGD guide were responded to by the majority of the participants)was achieved. Audio-recordings were transcribed verbatim.

Sample Description

Following our recruitment process, fourteen respondents agreed to participate in the group discussion about their experiences and challenges of the residency training program.

To ensure the privacy and confidentiality of the respondents, they were given a unique identifier. Among them, 85.7% (12) were male, while 14.3% (2) were females. Eight respondents were from SW(57.2%), while six respondents were from SS (42.8%). The

Respondents were from various centres within the geo-political zones; University College Hospital, Ibadan (UCH) -2, Obafemi Awolowo University Teaching Hospital (OAUTH) - 2, Lagos University Teaching Hospital (LUTH) - 2, LAUTECH Teaching Hospital (LTH) - 2, Rivers State University Teaching Hospital (RSUTH) - 2,Federal Medical Centre (FMC) Yenagoa - 3 and Niger Delta University Teaching Hospital (NDUTH)- 1. Employment cadre of respondents includes one (7.1%) house officer, one (7.1%) senior medical officer, four (28.6%)registrars and eight (57.2%), senior registrars.

Analysis

Transcripts were analysed and thematically coded according to the research themes that emerged from the discussion. Coding was done using NVivo 12 program. Open coding was also used to identify specific themes that emerged from the discussions. Themes and subthemes were generated and supported with illustrative quotations from the discussion.

Ethical considerations

The National Ethics Review Committee, Federal Ministry of Health approved before fieldwork commenced (NHREC Approval Number NHREC/01/01/2007- 26/06/2019). Written and verbal consent was gotten from participants before conducting the session. All information obtained from each participant, including personal details, were treated with the utmost confidentiality.

Results

The result of our analysis showed that respondents opined that there are challenges and gaps in the residency training program in Nigeria. We identified three core themes that represented the experiences and participant's assessment of the residency training program while the last theme focused on other challenges of residency training and recommendations (see table 1). These themes were presented with supportive quotes to buttress respondents' opinions further.

Table 1: Summary of FGD findings

OBJECTIVE	THEMES	COMMON SUB-THEMES
To explore the views of early career doctors on residency training and clinical practice in Nigeria	***Description of Residency Training Program***	
	Unfavourable conditions	The residency programme is skewed mainly towards service delivery
		Perception of the inadequacy of operations of the programme
	Workload	Residency training in Nigeria is a bit tedious
	Time constraints	Most of the time is directed towardsclinical service via viz patient care with little time for other things.
	Mentorship	Mixed opportunities for mentor-mentee relationships
	Physical environment	The inability of training centres to provide accommodation for all residents
		Inadequacy of resources for the training
	Assessment/Challenges of residency training	
	Assessment of Practice Dissatisfaction	*Dissatisfied with:*
	Reward system	Pay benefit/contingent reward/promotion, living condition and selection of applicants into the residency program.
	Mentorship	Lack of mentorship and power/authority abuse by sometrainers.
	Social support	Working relationship with colleagues/supervisors, marital life and extracurricular activities.
	Emotional support	Psychosocial support.

	Workload	Workhours distribution and quality of care(heavy work burden).
	Physical environment	Facilities/equipment's for services and training
	Suggestions and recommendation	
	Intervention by hospital management and government	*Formulation and implementation of new policies as regards*:
		Job description/specification.
		Excellent remuneration & benefits.
		Standardization of operationsof the residency training program.
		Review of the programme for international competitiveness.
		Provision of research laboratories and grants.
	Entry into the residency program	Selection into residency training at training institutions should be more merit-based.
		Designated committees should guide the employment of ECDs into the training institutions.

Description of Residency Training Program in Nigeria

All the participants in this study freely expressed their perceived view of the residency training program in Nigeria. The degree of stress being exposed to during residency training was popular among the respondents. All the respondents unanimously claimed to have experienced unfavourable conditions during their residency training programmes such as a high degree of work, insufficient time, lack of mentorship, and poorly equipped training facilities. As reflected in the below verbatim expressions:

"Residency training in Nigeria is a bit tedious because most times, most residents do a lot of work in taking care of patients …" (R1 SW).

"Generally looking at the residency training I think it is poor" (R1 SS).

"We have a problem with mentorship, residency program is supposed to be a program where you should be mentored by a tutor all through your training, but you know in this part of the world we don't have that" "We rarely have centres that are well-equipped for this training, so it is more or less like a self-effort thing" (R2 SS).

"Let me say we are not so conformed with the universally accepted practice outside the country and therefore, and this has discouraged many people in joining the residency program as it is" (R2 SW).

Besides, one of the discussants gave an assertion that was entirely different from the above points on the residency training program:

" It might just be better that we call it postgraduate clinical training because the word residency means the residents are resident within the hospital. So the questions are how many hospitals really have all their resident's resident in the hospital? To the best of my knowledge, especially in the southwest, there is no hospital that accommodates all residents within the hospital" (R8 SW).

Another evident fact from this discussion is that the majority of the participants appeared not to be aware of the criteria for selection into the residency training program. Although it is believed that the selection is based on the doctor having passed primaries, some still felt that entry into residency training in training centres/institutions had to be influenced, as opined by some of the participants. Some of the views of the participants:

"Who knows" "personally I don't know how I got into …, I don't know the criteria. I just did exam,

and they said I passed I don't know my score; I did interview I don't know my score the next thing they called me after of course, you have to do the normal leg work which we all know that in Nigeria today you need some extra push even if you passed or you succeed in interviews you may not get in" (R7 SW).
"I think once a doctor has met the requirements of having primaries; he should be selected irrespective of whether he knows somebody or not" (R3 SS).
Residency training has three objectives; service, training and research. However, participants (100%) stated that these objectives are skewed towards service only at the detriment of others. Also, the emphasis was made on disproportion of these objectives (60%, 20%, 20% respectively) as priority is mainly on service. The respondents believe there are gaps in their training.
The below transcripts illustrated the described analogy:
"I will look at the residency in three parts: service, training and research with the way residency is structured ok I feel those three objectives have to be met. However, in most institutions, the objectives are skewed towards mainly service to the detriment of the other two objectives" (R7 SW).
"I will apportion 60% to service while I will give 20% to training and research respectively" "Priority is on service, service and service. People get stressed up, overworked" (R5 SW).

Assessment of Practice Dissatisfaction/Satisfaction

From the generated transcripts, all participants aggressively reported to be dissatisfied with the training experience in terms of pay/fringe benefit/contingent reward, promotion, working relationship with colleagues/supervisors, psychosocial support, living condition, workhours/workload distribution, extracurricular activities, marital/social life, quality of care, facilities/equipment's for services and training.
"We are not satisfied at all" (first eight respondents)."I think it has not been very palatable on my side. Residency training has not been fine, albeit we just do what we can do to move on" (R2 SS).
"We are grossly dissatisfied" "Also we don't have closing hours" (R5 SW).
"The in-person motivation for me where I am training is not there where you are owed two years' salary where do you get money for research, to take care of yourself or to even to subscribe to journals and pay for articles" (R8 SW).
"I come from state institution where our pay is not encouraging because the whole thing about residency training is geared towards service delivery (service delivery). We also don't have time for the training itself and for research and asides that everybody is almost overworked" (R2 SS).
"I cannot be satisfied with the money, I cannot be satisfied with the relationship with my superiors I feel many of them have mortgaged our future, and I am saying this with all sense of humility and responsibility, do we have work hours? So we can never be satisfied" (R7 SW).
On the other hand, a participant stated that she was satisfied with the mentorship program in her centre but emphasised on financial constraints and unrewarding system.
"My own personal residency experience is good, and it is bad being that I come from a centre where our mentorship is very good. We have the consultants that are always available for us, and they give us time, but the bad part of it is the pay (R1 SS).
Participants highlighted other challenges of residency training as; irresponsibility, lack of up-to-date knowledge, mentorship program and power/authority abuse of trainers. As reflected in the below verbatim expressions:
"The trainers too need to take responsibility because we are there because of them that is why is called training institution but situations whereby you are in a facility whereby your trainer doesn't even bother what you are doing in the training programme (you know) it affects you as an individual and also affects the program as a whole" (R2 SS).
"Still with the trainers, somethings change over and over again so sometimes some trainers have one particular skill, and they have been with it for too long even if it is old fashioned, so they don't go with the change" (R3 SS)
"I still believe one of the fundamental issues that affect residency training here in this country is witch-hunting in the sense that may be at the local political level you and somebody has had some political fight and the person happens to be your senior, and the person is now a fellow he or she will be waiting for you in Ibadan to go and fail you, and by the time it happens the first, second and third time the person will be frustrated and even go out of the program" "It has happened in different

institutions, and most of my classmates are victims of that is why I want to bring it forward" (R5 SS).

Suggestions and Recommendations by respondents

Based on the challenges mentioned above by the participants, recommendations to mitigate these challenges were proffered depending on the different stakeholders involved.

Hospital management and the government should formulate and implement new policies as regards job description/specification, excellent remuneration & benefits, standardisation of the residency training program.There should be a more structured training program which, among other things, stipulates dedicated time for research – this will encourage residents to do research. Furthermore, selection into residency training should be more merit-based rather than by being externally influenced. In addition, the curriculum should be reviewed to include more courses on leadership and ethics. Provision of research laboratories and grants, training centres' capacity should be enlarged to absorb more doctors for the training. Training programs at the various centres should be more organised as well as there should be research days which will serve as free days so as to encourage residents to do research.

"I feel the best thing is to formulate a policy for the training" "All these job specifications and job descriptions we can look into it" (R3 SS)."Salary is a major incentive for people" "In the early 70s and 80s a lot of people were in private practice because it paid more than residency training. We may be tilting towards that direction now staying abroad is better than staying here" (R5 SW).

"I think importantly we have to standardise our residency training vis-a-vis validating it with what we have outside the country" (R6 SW).

"I think once a doctor has met the requirements of having primaries; he should be selected irrespective of whether he knows somebody or not" (R3 SS)."I think as part of our curriculum from the medical school, leadership should be inculcated because as medical doctors by virtue of that our position we are already leaders somehow" (R5 SS).

Respondents also proffered recommendations as regards prompt employment and replacement in the programme and a designated committee/board that guides the employment of ECDs into the training programme without delay:

"I think apart from having primaries. First, doctors that have just graduated or have finished their youth service can actually be given the opportunity as a MO(Medical officer) to go into these different fields; they can write primaries there and be re-admitted" (R5 SS).

"I think there should be a board that is set up and all hospitals should be part of the board to know the spaces that are available so as soon as we have people who have primaries already, they are placed" (R4 SS).

DISCUSSION

Residency training programme in Nigeria is a structured, institution-based, competency training programme for doctors and dentists who have acquired a necessary Medical/Dental degree (MBBS/BDS) and upon completion of training are fellows of a postgraduate Medical College and are appointable as Consultants/Specialists in their respective specialities.[8] These rigorous graduate trainings are provided by fellows who serve as consultants in various teaching centres which may be tertiary or secondary in the healthcare system. [7, 9, 10]The program is crucial for the provision of the critical specialist workforce for the Nigerian health system, which is essential to prevent the loss of scarce foreign exchange such as when the training was doneabroad (as was the practice before the 70s).[7, 11, 12]Critical stakeholders include the trainees and their trainers; the government (to enact enabling laws, provide leadership as well as funding), and the general public (who are the beneficiaries of the specialist skills and services).

The results of this exploratory study indicate that there are current challenges that require improvement in order to improve the quality of the residency training program, from the respondents' perspectives.The problems encountered by the resident doctors, appear to be a combination of the general problems of the average Nigerian civil servant, coupled with the burden of a training position in the setting of poor infrastructure.[8]

Respondents expressed dissatisfaction with their training experience in terms of pay/fringe benefit/contingent reward, promotion, working relationship with colleagues/supervisors, psychosocial support, living conditions, work hours/workload distribution, extracurricular activities, marital/social life, quality of care, facilities/equipment's for services and training which is in line with previous studies.

The above findings are not just an overstatement of

facts, as there is existing literature also to support them.[9, 10] Previous studies which explored the surgical trainees' views and noted lack of time/motivation, indifference, poor knowledge of research methods, inadequate training facilities, poor welfare and inadequate sponsorship/ poor remuneration as challenges confronting their training. Another study that examined trainees' perceptive also found that training was inadequate and some deficiencies were identified.

A consequence of the overall dissatisfaction among the respondents is the effect it has on the quality of care given to patients.[13-16] The patient's overall care and management are moderated by factors spawned from the level of skills needed to deliver care by physicians, through the availability of technology to the number of patients seen by the doctor per hour or the number of calls per day as well as the cooperation and skills of support staff.[14, 17]

In recent times, there has been an increased agitation worldwide among doctors on issues relating to job satisfaction.[14] This agitation revolves around the factors as mentioned above.[14] Doctors are more satisfied when they perceive that they are meeting their patients' needs by delivering high-quality care and dissatisfied when they perceive barriers to delivering same. [18] Previous qualitative studies have explored the determinants of American doctors' satisfaction by gathering data using a combination of surveys and focus group discussion.[18]

Interestingly, most of these issues highlighted are mainly administrative/organisational, and a large part is traceable to the employers. Therefore, the resolution of these challenges lies mainly with the various employers; who provide the jobs as well as the platform for training. The trainers are not left out of such resolution, especially by developing of a structured mentorship program, strengthening the current practice training-the-trainer program,supporting the implementation of nationwide residency matching program and generally be at the vanguard of general quality improvement of the residency training program.[19, 20] The effort of administrators in resolving these observations will go a long way in ensuring satisfied resident doctors, much comfortable programme. All these will go a long way in impacting on the patient outcome.

LIMITATIONS AND FUTURE RESEARCH

The methodological limitation was recognised as only two geo-political zones were represented in the study. However, the result of this study is a valuable contribution to the knowledge of the trainees' perception of the residency training program in Nigeria.

Future research in the area of conducting key informant interviews (KII) with key players in health system on their role in the residency training program will provide further insights on the drivers of the challenges mentioned above, proffer solutions and inform policies on the way forward. A large national quantitative study will also be beneficial.

CONCLUSION

This investigation provided a robust output on the challenges of residency training among ECDs as regards their experience and practice assessment; also proffered recommendations to mitigate the challenges. Currently, there appears to be a high level of dissatisfaction among resident doctors, which can be resolved via organizational strategies.

Disclosure

The confidentiality of respondents was protected, and authors' roles were separated from participants' roles. All authors are members of NARD except IA, FF was former executive officer, OO is a current National Executive officer and SO is a current South West Caucus Leader.

Acknowledgement: The National Executive Council of NARD, Research Collaborator Network advisors and the CHARTING study Research Assistants (Tobi Akande, Iyanu Adufe and Bunmi Ogunbode)

Funding body: Nigerian Association of Resident Doctors (NARD)

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Spirituality And Medicine: Should Patients Be Allowed to Exhibit Their Religious and Spiritual Beliefs While Receiving Medical Care?

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ABSTRACT

Background: Religion is a collective worship while spirituality is an individual practice of religious beliefs. There are various religious and spiritual perception to disease, ill-health and caring for the sick.

Case Summary: This is a case of a 27 year old Nigerian motor mechanic who presented with hypovolaemic shock due to chronic diarrhoea. Access to intravenous cannulation for resuscitation was difficult and patient and his caregivers suggested that money be used to torch the intravenous cannula for intravenous access to be successful. The patient was not allowed to torch the intravenous cannula with money. Intravenous access was successful after two more attempts as the patient was in shock at presentation.

Conclusion: Patent education is necessary at all times as various beliefs may be attached to the illnesses. Though patients may have psychological satisfaction if allowed to practice their religious beliefs while receiving medical care, it may cause conflict.

Introduction

Spiritual and traditional beliefs arecommon in most parts of the world. Nigeria is a country in the West Africa sub-region, and there are three main religions practiced in Nigeria namely Christianity, Islam and African Traditional Religion. The relationship between spirituality, religion and medicine isa long and complex one. [1] Spirituality can be defined as the quality of being interested in religion or religious matters, and religion is associated with institutionalized beliefs, practices and worship which is more organized. [2-4] In Nigeria, there is a dominance of tradition, culture, religion, health and disease.[1] Globally despite the race there are beliefs and practices concerning disease and health.[4,5] These health beliefs and practices vary with religion[3]. Some Nigerians no matter theirlevel of education still patronize traditional and spiritual healers when sick.[5] Religion is an important component of healthcare though this seems to have been unnoticed.[6] Religion and spirituality have become firmly established concepts in medicine, leaders in medicine continue to debate on the relevance of religion and spirituality to health and healthcare.[7] All cultures and religious systems have beliefs concerning health to explain the causes of diseases, its management and who to be involved with it.[8] There arefour prominent pathways in which religion influenceshealth which is health behaviors, social support, psychological states and influences.[3] Researches done show a relationship between religion, spirituality and health behaviors.[1,8] Most healthcare facilities in Nigeria to some extent allow the practice of Christianity and Islam. Some even have a place of religious worship such as a Christian chapel or mosque within the hospital premises. Various religious organizations involved in charity are also allowed to distribute gifts to patients but may or maynot be allowed to share their faith or pray for patients. The African traditional religion is diverse with no written literature or holy book. Its priests are the witch doctors (known as native doctors in Nigeria) and its worship comprises of sacrifices of various animals. Witch doctors are not usually allowed into Nigerian hospitals especially when dressed in their regalia that look scary. This is case report of a patient who wants to exhibit his spiritual belief while receiving medical care.

Case Report

A 27 year old male motor mechanic presented with

complaints of diarrhoea and weight loss of six months duration. He had been admitted in several hospitals for the same complaints where various infusions and intravenous medications where administered. On examination, he was emaciated, very pale, sweating profusely with cold clammy extremities. The pulse rate was very fast and thready, blood pressure was 70/30 mmhg; respiratory rate was 30 cycles per minute. The abdomen was tender in all the regions, vesicular breath sound was heard on auscultation of the chest. There was a history of chronic alcohol intake but he does not take tobacco in any form. A diagnosis of hypovolaemic shock due to gastroenteritis was made with a differential of immune suppression and retroviral disease. His random blood glucose was 5.6 mmol/l, and patient was to be resuscitated with intravenous normal saline. Attempt at intravenous can nulation was initially difficult. After several unsuccessful attempts, the patient's brother suggested that he wants to give fifty naira (a denomination of Nigerian currency) to the patient to use to touch the intravenous cannula. That he the patient's brother believes that when the money touches the intravenous cannula the next attempt at intravenous cannulation will be successful. The patient was not allowed to touch the intravenous cannula with money as difficult intravenous cannulation was expected as the patient was in shock. Intravenous cannulation was successful after the next two attempts.

Discussion

People have different beliefs about their health and spirituality. Discussions about spirituality and religion have long been considered inappropriate in the study and practice of medicine.[9] But in recent times this is not so as more attention is now given to it[7]. In this case the patient and his caregivers believed there was a spiritual component of the disease that was why intravenous access was difficult despite the fact that his peripheral veins were prominent. There was the history of difficult intravenous cannulation in the previous health facilities the patient had visited and the intravenous cannula tissues easily from the veins. The patient knows that the doctor certainly intends what is best but the patient does not believe that “the doctor knows best”in this instance.[3] In most African communities it is believed that ill-health have spiritual origins.[6] Hence some sort of spiritual help isrequired even if the individual seeks medical care. In a situation whereby necessary medical investigations are done yet a definite diagnosis could not be made, but the patient is deteriorating, they may decide to adopt spiritual and religious approach.[6] The question next is if patients should be allowed to exhibit their spirituality and practice their religious obligations while receiving medical care. In Nigeria, some cults and social societies exists which claim to profound spiritual protection on its members with the promise that no sharp object such as knives or bullet from a gunshot can penetrate their body hence they cannot be assaulted. The patient in this case claimed that he does not belong to any cult. He had the spiritual belief that if the intravenous cannula was touched with money, he was spiritually giving it permission to pierce his body and also buying it spiritually. Meanwhile the patient was in hypovolaemic shock which may have caused collapse of the peripheral veins. Some of these spiritual beliefs may mislead patients.

The existence of cults in the world and Nigeria is not a new phenomenon and its strength or wane in practice is not a strange concept.[11] Patients sometime ask physicians to pray with them.[9] The goal of good medical care is to act in the best interest of the patient[9] hence the physician has a unique privilege to observe the way a patient's religion and spirituality influences them including their health.

Conclusion

A relationship exists between patient's religious beliefs, spirituality and medicine. Sometimes patients may be allowed their personal religious beliefs and spirituality to give them a physical and psychological satisfaction especially if it has no negative effect on medical care. This should not interfere with educating the patient on the disease process. Like in this index case patient was not allowed to exhibit his reli8gious belief as difficult intravenous cannulation was expected in a patient with shock. Meanwhile patients should be adequately educated on any diagnosis and management plan. There should be a shared decision and patient centered care.

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EVALUATION OF INFERTILE WOMEN USING TRANSVAGINAL ULTRASOUND IN A TERTIARY HEALTH FACILITY

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ABSTRACT

Background
Ultrasound is one of the first imaging modalities in evaluation of infertile women and generally all women undergo an initial pelvic ultrasound to detect any probable cause of infertility. The aim is to document transvaginal ultrasound findings in women being evaluated for infertility.

Materials and methods
This was a descriptive cross-sectional study conducted at the radiology department, University of Abuja teaching hospital, between May 2015 and April 2016. All patients who were being evaluated for infertility and had a trans-vaginal scan within the study period were documented.

Result
The mean age of two hundred and three infertile patients evaluated with mean age of 32±19 years and age range of 15-49years. The predominant age group was 25-34 years accounting for 86(42.4%). Primary infertility constituted 85(41.9%) while secondary infertility was 118(58.1%).Out of 203 patients, 110(54.2%) had normal findings on TVS while the remaining 93(45.8%) of patients had abnormal ultrasound. This was statistically significant p=0.02.Uterine fibroid, fluid in POD, polycystic ovary were the common pathologies seen on TVS with uterine fibroid the most common. The commonest combined TVS findings were fluid in POD, endometritis and hydrosalphinx. There was significant difference between right and left ovarian volume among infertile patients with polycystic ovaries.

Conclusion
The study has showed high yield of sonographicabnormalities detected on TVS among patients with infertility further buttressing the pivotalrole of TVS as an invaluable tool for investigating infertile women.

Keywords: Infertility,transvaginal,ultrasound, women

Introduction
Infertility is a global problem and affects 8-12% of couples[1]. It is a major cause of visitation to the gynaecology clinic in Nigeria constituting about fifty percent (50%) of gynecological clinic attendance[2]. It is defined as a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.[3]

The incidence of infertility varies from one region of the world to another, being highest in the so-called infertility belt of Africa which includes Nigeria[4]. Hospital-based study incidence of infertility reported in Nigeria are 4.0%, 15.4%, 48.1%, 23.9% and 15.7% from Ilorin (North central)[5], Abakaliki (South east)[6], and Oshogbo (South west)[7], Bauchi (North-east)[8] and Sokoto (North west)[9] respectively.

Infertility is quite a sensitive issue and can be quite challenging for the women especially in the African setup. Proper evaluation of women with infertility is necessary in order to detect any structurally abnormalities which may necessitate treatment. Ultrasound is one of the first imaging modalities in evaluation of infertile women and generally all women undergo an initial pelvic ultrasound to detect any probable cause of infertility[10]. This is so because ultrasound is readily available, accessible, non-invasive, relatively cheap, and does not use ionising radiation. It provides useful information and can characterize lesions in the uterus, ovaries, adnexa, and the cervix which may likely be responsible for infertility[10,11]. Transvaginalsonography (TVS) which was designed in 1985 to overcome the limitations of transabdominalsonography (TAS) and has gained wide acceptance as a reliable tool for solving diagnostic problems in women with gynaecological symptoms[11-13]. TVS provides greatly improved resolution due to the higher frequencies employed and proximity to the pelvic organ and as such provide better image quality of uterus, ovary and the fallopian tube however the fallopian tubes can be visualised only when there is fluid in the tubal lumen or outside the tubes[11].Due to these TVS has become a very invaluable tool in evaluation of women being investigated for infertility[11,14]. This study is aimed at documenting the transvaginal ultrasound findings in women being evaluated for infertility.

METHODOLOGY

Study Design: This was aprospective descriptive cross sectional study which spanned from May 2015-Aprill 2016.

Study Area: This study was carried out at the Radiology Department of University of Abuja teaching hospital, Gwagwalada, (F.C.T). The Hospital is located in Gwagwalada whose geographical coordinates are 8° 56' 29" North and 7° 5' 31" East.

Study Population: This comprising of two hundred and three women evaluated for infertility from the general outpatient clinic and gynaecological clinic who met the inclusion criterion were recruited for the study. Relevant demographics which included age, parity, BMI, duration of infertility comorbidity and ultrasoundfindings were documented using a well-structured questionnaire.

Inclusion Criteria:

i. Women within the ages of 15-49 years.

Exclusion criteria:

i. Huge abdomino-pelvic mass
ii. Those that decline to participate in the study.

Transvaginal Sonography

The procedure was explained to the patients and consent obtained. Patients emptied their urinary bladder before the commencement of the examination and were told to lie on the couch in supine position with legs flexed at the knee. A condom sheath to which coupling gel is added was placed over a high frequency 7MHZ transvaginal probe of EMP G70 ultrasound machine manufactured by Shenzhen Emperor Electronic Technology®, China 2011.The probe was inserted into the vaginal fornix. Both longitudinal and transverse images of the uterus and ovaries were obtained and findings were documented. Pathologies diagnosed on TVS in this study were based on the following sonographic criteria:

Uterine fibroid

Uterine fibroidappeared ashypoechoic,isoechoic, hyperechoic or heterogeneous solid masses within the intramural, subserosal and submuscosal layers of the uterus. They can be multiple or solitary and of varying sizes. The location within the uterus is also classified into fundal, body, lower segment and multiple.

Endometrial polyp

Focal bulge of theendometrialcontour, or focal echogenic mass with presence of entrapped fluid or secretions proximal to polyp or diffuse thickening of the endometrium. Presence of surroundinghypoechoic halo and presence of mobility of the lesion.

Cervical polyps

Hypoechoic or echogenicsessile or pedunculated well-circumscribed masses within the endocervical canal or focal bulge of the cervical contour.

Hydrosalpinx/pyosalpinx

Seen as fluid-filled tubular, thickwalled structures with or without internal echoes in either adnexae.

Endometritis

Seen as marked heterogenous and thickened endometrium (>10mm)

Oophoritis
Enlarged ovaries with ill-defined margins that were adherent to the uterus/

Fluid in pouch of Douglas (POD)
Seen as significant hypo or anechoic collection in the POD

Polycystic ovaries
Enlarged ovaries greater than 10ml in volume with presence of 12 or more follicles in number which are peripherally arranged in each ovary measuring 2-9 mm in diameter as well as increase in central stromal echogenicity and thickness.

Atretic ovaries
Ovarian volume less than $2cm^3$

Data analysis
Data was collated and analysed using SPSS 19.0 software 2010 by IBM^R USA. P-value<0.05 was taken as statistically significant.Pearson correlation test was done to determine the relationship between variables.The results are presented in the form of tables.

Ethical consideration: The study was approved by the Ethical Committee of the

Results
There were two hundred and three patients who presented with infertility and transvaginal scan were performed during the study period. The mean age of study population was 32±19years with age range of 15 and 49 years. . Majority of the patients were in the age group 25-34 years with 86 women representing 42.4% Primary infertility constituted 85(41.8%) while secondary infertility was 118(58.1%). Table I
Out of 203 patients, 110(54.2%) had normal findings on TVS while the remaining 93 women had abnormal ultrasound findings representing 45.8%. This findings using TVS was statistically significant (p=0.02). Uterine fibroid (Fig 1), fluid in POD(Fig 2), polycystic ovary, endometrial polyp and hydrosalpinx constituted the main pathologies detected on TVS scan accounting for 18.7%, 9.4%, 5.4%, 4.4% and 3.4% respectively.Table II.
Among patients with primary infertility, uterine fibroid 17(20.0%), polycystic ovary 10(11.7%), and fluid in POD 8(9.4%) constituted the major abnormalities found, while in patients with secondary infertility uterine fibroid 21(17.8%), fluid in POD 11(9.3%), endometrial polyp6(5.1%), andhydrosalpinx 5(4.2%) were the main pathologies detected on TVS.The commonest combined TVS findings were fluid in POD, endometritis and hydrosalphinx. Table II.
Of the 38 patients with uterine fibroid 25(65.8%) had multiple fibroid nodules while the remaining 13(34.2%) had solitary fibroid nodules. Four womenhad calcified fibroid nodules representing 10.5%. In terms of type of fibroid, 21 infertile women had intramural fibroid nodules representing 55.3% while 8(21.1%) were mixed, 7(18.4%) were submucosal and 2(5.3%) were subserosal. Base on location, in17(44.7%) of the infertile women, the fibroid nodules were of multiple location, 13(34.2%) were within the body of the uterus, 5(13.2%) were at the fundus and 3(7.9%) at the lower uterine segment. Mixed echotexture was the commonest echopattern of the uterine fibroid demonstrated in this study accounting for 19(50.0%) as shown in Table III.
Out of the 19 patients with fluid in the POD 14 patients representing 73.7% gave history of suggestive of genital infection to include lower abdominal pain, vaginal discharge, urinary tract infection and dyspareunia while 5(26.3%) gave history of vaginal discharge and dyspareunia. All had a vaginal swab for microscopy, culture and sensitivity test (MCS).The MCS result of 11 out of the 14 infertile patients representing 78.6% were positive forvarying microorganism and were subsequently diagnosed with pelvic inflammatory disease and managed as such.
Out of the 11 patients with polycystic ovaries, 9(81.8%) had bilateral polycystic ovaries while the remaining 2(18.2%) had left or right polycystic ovary. The mean ovarian volume of patients with polycystic ovaries was 15.3±6.2 for right and 14.5±5.5 for left.The difference in the mean ovarian volume of right and left ovary was statistically significant p=0.004. The mean number of follicles for right and left ovaries was 11.3±5.9 and 10.7±3.7 respectively. The difference in the mean number of follicles of right and left ovary was statistically significant p=0.01. The average size of the right and left follicles was 6.2±3.2 and 5.5±2.9. However the difference in the size of follicles of the right and left ovary was not statistically significant p=0.13. Table 1V.
Results

Table I: Age distribution of infertile women by type of infertility.

Age group (years)	Primary infertility Freq	(%)	Secondary infertility Freq	(%)	Total Freq	(%)
15-24	11	5.4	17	8.3	28	13.8
25-34	39	19.2	47	23.2	86	42.4
35-44	22	10.8	35	17.2	57	28.1
45-54	13	6.4	19	9.4	32	15.7
	85	41.8	118	58.1	203	100.0

Table II: Distribution of transvaginal ultrasound findings among infertile women

Diagnosis	**Primary infertility**		**Secondary infertility**		**Total**	
(years)	Freq	(%)	Freq	(%)	Freq	(%)
Normal finding	42	49.4	68	57.6	110	54.2
Endometrial polyp	3	3.5	6	5.1	9	4.4
Fibroid	17	20.0	21	17.8	38	18.7
Fluid in POD	8	9.4	11	9.3	19	9.4
Polycystic ovaries	10	11.7	1	0.8	11	5.4
Endometritis	2	2.4	3	2.5	5	2.5
Oophritis	0	0.0	1	0.8	1	0.5
Atretic ovaries	1	1.2	0	0.0	1	0.5
Hydrosalpinx	2	2.4	5	4.2	7	3.4
Ovarian mass	0	0.0	2	1.7	2	1.0
	5	100.0	118	100.0	203	100.0

Table III: Uterine fibroid features among infertile women

Fibroid features	Freq(n-38)	(%)
Types of fibroid		
Intramural	21	55.3
Subserosal	2	5.3
Submucosal	71	8.4
Mixed	8	21.1
Pedunculated	0	0.0
Location of fibroid		
Fundus	5	13.2
Body	13	34.2
Lower segment	3	7.9
Multiple	17	44.7
Echopattern of fibroid		
Hyperechoic	6	15.8
Hypoechoic	10	26.3
Isoechoic	3	7.9
Mixed	19	50.0
Size of fibroid		
< 5cm	25	65.8
≥5cm	13	34.2

Table IV
Ovarian volume, follicular size and number of follicles among infertile patients with polycystic ovaries

Ovarian parameters	mean	sd	p
Volume			
Right ovary	15.3	6.2	0.004
Left ovary	14.5	5.5	
Number of follicles			
Right ovary	11.3	5.9	0.01
Left ovary	10.7	3.7	
Size of follicles			
Right ovary	6.2	3.2	0.13
Left ovary	5.9	2.9	

FIG 1: Transvaginal scan showing hypoechoicsubmucosal fibroid indenting and distorting the endometrial plate

FIG 2: Transvaginalscan showing hypoechoic collection in the pouch of Douglas

Discussion

Imaging plays an important role in the assessment of women with infertility. Although there has not been general consensus work up protocol for infertile patients, however majority of infertile women undergo a baseline pelvic ultrasound (transabdominal or transvaginalsonography) andhysterosaphingography to determine the cause of infertility. TVS was the tool used to determine the cause of infertility in this studybecauseit is cheap, does not use ionization radiation, readily available and provides good image quality of theovaries, uterus, fallopian tube and adnexa because of its proximity to the mentioned organs.

With regards to type of infertility in this study, secondary infertility constitutes the majority accounting for 58.1%, this corroborates with findings obtained by Nafeesa[14]. The preponderance

of secondary infertility in this study also agrees with studies from Africa[4,15,16]but differs from findings from Western World where primary infertility predominates[4,17]. The high prevalence of secondary infertility in Africa is likely as a result of high prevalence of poorly treated sexual transmitted infection, unsafe abortion and puerperal sepsis from unskilled birth attendance[16].

93(45.8%) of patients had abnormal ultrasound findings. The major TVS findings in this study were uterine fibroid, fluid POD and polycystic ovaries. Our findings differ from what was obtained by Nafeesa[14] and Ikepeme[18]where polycystic ovary was the commonest. The differences may be due to differences in the population studied. Ikpeme[18] inCalabar assessed women presenting with infertility and menstrual irregularity. Although Ikepeme also reported high incidence of uterine fibroid and chronic pelvic inflammatory disease in their study in Nigeria, only 6% of infertile patient were diagnosed with uterine fibroid by Nafeesa[14] in Indian. The differences further buttress the variation of causes of infertility within and among countries.

This study demonstrates high prevalence of uterine fibroid among patients with primary and secondary infertility. The high prevalence of fibroid in this study was probably due to the ability of the TVS probe to provide better resolution in visualization of smaller uterine nodules <5mm which may likely be missed on transabdominal scan. Also majority of the patients were clinically asymptomatic and uterine fibroid was an incidental finding on TVS.

Sonographic examination of fibroid is important in other to characterise the number, types, location and size of the fibroid which is very importantfor fertility work up of patient especially in planning surgery or for assisted reproduction. TVS has shown better characterization of uterine fibroid especially for small nodules less than 5mm[10]. A study by Maria*et al*[19]to demonstrate the effects of the position of fibroids on fertility confirms that location of the fibroid plays an important role in fertilization and in maintaining pregnancy and that submucosal fibroid has a lower pregnancy rate compared to intramural fibroid. In a study toassess the diagnostic value of transvaginalsonography in comparison with hysteroscopy in the evaluation of endometrial cavity in infertile women, Saralа*et al*[20] reported that TVS has a sensitivity of 97.07% and positive predictive value of 99.7% in diagnosing uterine abnormalities. Also Niknejadi*et al*[21] in their own study concluded that TVS is valuable adjunctive to hysteroscopy with high accuracy for identification and characterization of intrauterine abnormalities.

Fluid in the pouch of Douglas was next common finding among patient with infertility. Thou presence of fluid in the POD can be physiological or pathological, however most of the infertile patients with fluid in POD in this study gave history of one or two symptoms to suggest pelvic inflammatory disease to include lower abdominal pain, vaginal discharge, UTI and dyspareunia and were being manage as such after vaginal swabs were taken for laboratory work up. Genital infection is considered as the commonest single most important cause of infertility in Africa due to high prevalence of poorly treated sexual transmitted infection, unsafe abortion and puerperal sepsis from unskilled birth attendance[16].

Polycystic ovaries were the next common finding among patient with infertility in the index study. However prevalence of polycystic ovary was much higher among patients diagnosed with primary infertility compared to patients with secondary infertility. Reason for this may not be known. The transvaginal route improves study of polycystic ovary because good spatial resolution of the cyst and ovarian stroma. In a study in Ibadan by Bello *et al*[22] on polycystic ovaries, the prevalence of polycystic ovaries were much higher using transvaginal route when compared to the prevalence previously reported in the same locality using trans abdominal route and the increase prevalence was liken to improved sensitivity of the diagnostic tool used. However there was no significant difference in the prevalence of polycystic ovaries using transabdominal and transvaginal ultrasound in a study by Farquhar[23]. There were few unilateral polycystic ovaries in our study this is similar to what was reported by Ikepeme[18]. Althoughwe did not sought further to know the prevalence of polycystic ovarian disease among our infertile patient with polycystic ovaries however literature has revealed a possibility of having a polycystic ovaries without the disease[18]. The mean ovarian volume in our study among patient with polycystic disease was much higher than what was obtained by Ikpeme[18].

Conclusion

TVS is an important diagnostic tool in detecting abnormalities in the uterus, fallopian tube, ovaries and cervix of patients with infertility. Uterine fibroid and fluid in POD were the commonest pathology seen in this study among infertile women. Presence of Fluid in the POD may likely be related to pelvic inflammation disease and genital tract infection.

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DETERMINANTS OF SEVERITY OF HYPERBILIRUBINAEMIA AMONG GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENT NEONATES IN JOS NORTH CENTRAL NIGERIA

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ABSTRACT

Introduction: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is an inherited disorder capable of causing severe neonatal hyperbilirubinaemia, kernicterus and death. Identifying such neonates and other factors that could aggravate their clinical states have definite place in managing them for favourable outcomes.

Materials and Methods: One hundred and fifty (150) icteric neonates admitted into the Special Care Baby Units of the Jos University Teaching Hospital, Plateau State Special Hospital and the Bingham University Teaching Hospital were recruited for this study. It was a cross sectional descriptive study conducted between March 2013 and February 2014. Parental consents were obtained and Clinical information was gathered using a questionnaire, weight were measured in grams while laboratory investigations that included Full Blood Count (FBC), Reticulocyte Count, Serum Bilirubin (SB) Assay and G6PD activity levels were carried out.

Results: Mean age of the studied neonates at presentation was 3.28 ± 3.11 days while mean age of detection of jaundice was 2.86 ± 1.67. One hundred and five (70%) were delivered at full-term gestation (>37weeks) while 45 (30%) were delivered preterm (<37 weeks) with twenty-nine (19.3%) having history of jaundice in siblings. Fifty (35.7%) had birth weight of less than 2500g while the birth weight of 10 (6.7%) were unknown. Sixty-one of these neonates (40.7 %) were G6PD deficient with mean total serum bilirubin of 205.01 ± 96.57µmol/L.

Conclusion: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is a common enzyme disorder among neonates presenting with hyperbilirubinaemia which can be aggravated by other factors.

Key words: Determinants, Hyperbilirubinaemia, Glucose-6-phosphate dehydrogenase deficiency, Neonates

Introduction

Glucose-6-phosphate dehydrogenase (G6PD) deficiency is an X-linked disorder and a common cause of haemolytic anaemia with an estimated 400 million people affected worldwide. [1] G6PD is a cytoplasmic enzyme distributed in all cells for the purpose of catalyzing glucose-6-phosphate oxidation to 6-phosphogluconolactone required for regeneration of reduced glutathione which protects these cells against peroxide and other reactive oxygen species. [1] Triggers of oxidative stress on G6PD deficient red blood cells (RBC) like acute illnesses, infections, fava beans, naphthalene balls, antibiotics as well as some antimalarials commonly used in our environment are documented causes of haemolysis, anaemia and neonatal hyperbilirubinaemia, a major cause of morbidity and mortality in neonates [2]

The G6PD enzyme deficiency is characterized by markedly diminished activity in the range of 8-20 percent of the normal reference range of 65-150 percent activity. [2] Prevalence of G6PD deficiency are higher in persons of African, Asian, Semitic or Mediterranean descent. [2] In the United States of America, African-American males have a prevalence of about 10% in the general population and 22.5% among jaundiced neonates. [3] Among the Kurdish Jews, a prevalence rate as high as 70% was

reported, 5% among the Chinese and as low as 0.1% in Japanese. [3]Prevalence of G6PD deficiency in the general population in Nigeria range between 4-26% with a report of 20.5- 35.3% prevalence amongst jaundiced neonates. [3] A study in Jos, Nigeria reported a prevalence rate of 20% among males. [4]

More than 60% of full term neonates and 80% of preterm neonates develop clinical jaundice during the first week of life noted by yellowish eyes and skin. [5, 6] Factors implicated in the mechanism of jaundice in G6PD deficient neonates apart from haemolysis includes, slower liver enzyme system maturation for bilirubin conjugation and excretion, neonatal maturity, presence of infection, method of feeding among others. [5,6]

This study is aimed at establishing the presence of some factors associated with developing jaundice in G6PD deficient neonates in our environment and their contribution to the severity of hyperbilirubinaemia in these subjects for the purpose of preventing neonatal morbidity and mortality due to neonatal hyperbilirubinaemia.

Materials and Methods

This descriptive cross-sectional study was carried out at the Special Care Baby Units (SCBU) of Jos University Teaching Hospital, Bingham University Teaching Hospital, and Plateau State Specialist Hospital, Jos with ethical approval from the Health Research Ethics Committees of these institutions. All Jaundiced neonates admitted into the SCBUs with parental consent and satisfying all inclusion criteria were enrolled while those whose parents refused consent, recently transfused neonates or those with cephalhaematomas, bleeding tendencies and birth asphyxia were excluded. Questionnaires were administered and the subjects assessed clinically for fever, pallor, jaundice, congenital malformations and muscle tone among others. Five milliliters of venous blood was taken into an EDTA and plain sample bottle forfull blood count (FBC) using the 3-part Sysmex (KX-21N 2007 model) haematology autoanalyser, Reticulocyte count by manual methods as described by Dacie and Lewis, bilirubin assay by the Jendrassik and Grof method using the Roche/Hitachi 902 SN 1694-019-1996 auto analyzer and G6PD enzyme assay was carried out using reagents and control samples manufactured by the Pointe Reagent Company (USA).

Data Analysis

Data analysis was with Epi Info Version 6 software. Relationship between categorical variables was tested using Chi-square while Student t-test was used to assess the significance between means of two groups. The results were reported in tables, proportions, and percentages. P value ≤ 0.05 was considered statistically significant.

Results

One hundred and fifty icteric neonates made-up of 92 (61.3%) males and 58 (38.7%) females (M: F= 1.6:1) with a mean age at presentation of 3.28 ± 3.11 days were studied. The mean age of detection of jaundice was 2.86 ± 1.67, median of 2.00 days within a range of 1-12 days. One hundred and five (70%) were delivered at full-term gestation (>37weeks) while 45 (30%) were delivered preterm (<37 weeks). Twenty-nine (19.3%) had history of jaundice in siblings compared to 121 (80.7%) with no such history. Fifty (35.7%) had birth weight of less than 2500g while 90 (64.3%) were of normal birth weight. Birth weight of 10 (6.7%) of the study subjects was unknown because they were delivered at home. G6PD activity ranged from 0.54-24.18 IU/gHb with a mean activity of 8.02 ± 4.87 IU/gHb while 61(40.7%) of the icteric neonates were G6PD deficient. The mean total serum bilirubin of the 150 subjects was 205.01 ± 96.57µmol/L, mode of 184.50µmol/L in a range of 86.70-606.00µmol/L.

Table-1 Clinical parameters of all subjects and G6PD status

Parameters	G6PD deficient; n=61	G6PD normal; n=89	t	χ^2	P value
Age (days)	3.39 ± 3.05	3.20 ± 3.17	0.37		0.71
Sex					
Male	45	47			
Female	16	42		6.71	0.01
Duration of pregnancy (weeks)					
Full-term	45	60			
Pre-term	16	29		0.70	0.40
Age jaundice was noticed	3.08 ± 2.09	2.70 ± 1.29	1.35		0.56
History of jaundice in siblings	10	19		0.57	0.45
Weight at birth g; n (%)					
< 2500	16	34			
≥ 2500	41	49		2.45	0.12
Weight at presentation g; n (%)					
<2500	24	41			
≥2500	37	48		0.67	0.41

Twenty two (36.1%) of the G6PD deficient neonates had mild hyperbilirubinaemia with a mean total serum bilirubin of 132.3 ± 24.6 µmol/L while 40 (44.9%) of the G6PD normal neonates with mild hyperbilirubinaemia had a mean total serum bilirubin of 135.8 ± 28.9 µmol/L. Development of hyperbilirubinaemia based on G6PD status was not statistically significant with P values of 0.49, 0.78 and 1.10 for mild, moderate and severe hyperbilirubinaemia respectively. (Table 2)

Table 2: G6PD status and severity of hyperbilirubinaemia

Hyperbilirubinaemia	G6PD status							
	Deficient			Normal				
	n	%	mean TSB	n	%	mean TSB	t	P
Mild	22	36.1	132.3 ± 24.6	40	44.9	135.8 ± 28.9	0.70	0.49
Moderate	24	39.3	205.6 ± 26.6	36	40.4	203.7 ± 24.2	0.29	0.78
Severe	15	24.6	383.1 ± 110.1	13	14.6	338.9 ± 100.4	1.10	0.28
Total	61	100		89	100			

TSB= Total Serum Bilirubin in µmol/L

One hundred and five (70.0%) full term neonates involved in this study had a mean total serum bilirubin of 216.1 ± 106.7 µmol/L, while 45(30.0%) preterm neonates had a mean serum bilirubin of 179.4 ± 59.8 µmol/L. Duration of pregnancy in relation to hyperbilirubinaemia showed significant statistical difference with a P value of <0.01 for moderate and severe hyperbilirubinaemia (Table 3).

Table 3: Duration of pregnancy and severity of hyperbilirubinaemia

Hyperbilirubinaemia	Duration of pregnancy							
	Full term			Preterm				
	n	%	mean TSB	n	%	mean TSB	t	P
Mild	23	51.1	135.5 ± 27.5	39	37.1	133.9 ± 27.5	0.27	0.82
Moderate	12	26.7	185.5 ± 9.7	48	45.7	209.2 ± 25.4	3.15	<0.01
Severe	10	22.2	272.8 ± 28.9	18	17.1	412.9 ± 100.3	4.27	<0.01
Total	45	100		105	100			

TSB= Total Serum Bilirubin in µmol/L

Jaundice was detected in 112 (74.7%) neonates recruited for this study within days 0-3 with 47 (42.0%) of them mildly hyperbilirubinaemic while 18 (16.0%) were severely hyperbilirubinaemic with a mean total serum bilirubin of 347.2 + 100.7 µmol/L. No statistically significant difference was established regarding the age at which jaundice was detected and severity of hyperbilirubinaemia (Table 4).

Table 4: Age of detection of jaundice and severity of hyperbilirubinaemia

Hyperbilirubinaemia	Age of detection of jaundice (days)										
	0-3			4-7			8-12				
	n	%	mean TSB	n	%	mean TSB	n	%	mean TSB	t	P
Mild	47	42.0	134.9 + 27.0	14	38.9	132.2 + 26.9	1	50.0	120.1 + 0.00	0.18	0.84
Moderate	47	42.0	206.8 ± 26.2	13	36.1	196.0 ± 18.5	0	0	0	1.40	0.17
Severe	18	16.0	347.2 + 100.7	9	25.0	373.5 +108.8	1	50.0	541.0 + 0.00	1.74	0.20
Total	112	100		36	100		2	100			

TSB= Total Serum Bilirubin in µmol/L.

Twenty nine (19.3%) had history of jaundice among siblings with 12 (19.4%) having mild hyperbilirubinaemia and a mean total serum bilirubin of 135.4 ± 27.8 µmol/L. This however showed no statistically significant difference when compared with those without history of jaundice in siblings (Table 5).

Table 5: History of jaundice among siblings and severity of hyperbilirubinaemia

Hyperbilirubinaemia	History of jaundice amongst siblings							
	Yes			No				
	n	%	mean TSB	n	%	mean TSB	t	P
Mild	12	19.4	135.4 = 26.1	50	80.6	134.3 ± 27.8	0.12	0.91
Moderate	13	21.7	208.9 ± 28.7	47	78.3	203.3 ± 24.1	0.71	0.48
Severe	4	14.3	362.5 + 81.1	24	85.7	362.6 + 111.2	0.00	1.00
Total	29	100		121	100			

TSB= Total Serum Bilirubin in µmol/L

Fifty (35.7%) had birth weight < 2500g (low birth weight) with twenty-Seven (54.0%) of them presenting with mild hyperbilirubinaemia with mean total serum bilirubin concentration of 136.2 ± 26.6 µmol/L. There was a statistically significant difference in severity of hyperbilirubinaemia with P value of 0.01 and <0.01 in moderate and severe hyperbilirubinaemia respectively (Table 6).

Table 6: Birth weight and severity of hyperbilirubinaemia

Hyperbilirubinaemia	Birth weight (g)							
	< 2500			≥ 2500				
	n	%	mean TSB	n	%	mean TSB	t	P
Mild	27	54.0	136.2 = 26.6	30	33.3	132.6 = 28.4	0.49	0.63
Moderate	13	26.0	187.5 ± 9.8	43	47.8	208.8 ± 26.9	2.86	0.01
Severe	10	20.0	286.2 + 55.1	17	18.9	409.7 + 105.9	3.41	<0.01
Total	50	100		90	100			

TSB= Total Serum Bilirubin in µmol/L

Discussion

Majority of the neonates in this study presented with jaundice within the first three days of life. Some studies done on cord blood have demonstrated that both non-haemolytic jaundice and jaundice attributed to haemolysis commence in-utero. [7, 8] In support of this theory, Kaplan *et al* demonstrated that G6PD deficient neonates had significantly higher serum bilirubin immediately after birth than those with normal G6PD activity. [8] He also reported a significantly higher serum bilirubin values evident on the third day probably reflecting the in-utero status. [8] Added to this is physiological jaundice attributed to neonatal immaturity known to appear between 24-72 hours of age, peaks at 4-5th day in term neonates and 7th day in preterm infants disappearing by the 10-14th day usually with serum bilirubin levels not exceeding 255 µmol/l. [8, 9] This may explain the early manifestation and presentation with jaundice in these neonates. Our finding fall short of statistical significance regarding age jaundice was detected, severity of hyperbilirubinaemia and G6PD status of the neonates but mean serum bilirubin concentrations were high. Other factors like sepsis, blood group incompatibilities and G6PD deficiency as demonstrated in our study are likely to have increased the serum bilirubin levels though not all risk factors for jaundice were assessed in this study.

Jaundice was detected in our subjects by most parents between days 0-3 after birth and our finding is supported by similar studies conducted locally and internationally. [10-12] The similarity of the age at presentation and when jaundice was detected in these neonates irrespective of their G6PD status, demonstrated the increased awareness most parents have on detecting jaundice early. Where parents lack the ability to recognize jaundice early, the resultant effect will be late presentation and delayed treatment of these G6PD deficient neonates increasing morbidity and mortality. Therefore, parents and care givers must be sensitized to have high index of suspicion for G6PD deficiency as a possible cause of neonatal jaundice in our environment especially with the variable triggers from baby care products to several medications. Development of jaundice early in life in most of our subjects and the fact that jaundice in the first 24 hours of life is often considered pathologic makes it imperative to rule out G6PD deficiency in neonates with jaundice at birth, especially in a high-risk population like ours. It also calls for the creation of a forum for follow-up of discharged neonates, for the purpose of assisting parents and relations detect jaundice early even after hospital discharge.

Preterm neonates in this study were found to have higher bilirubin concentration compared to full term neonates. This is attributed to the preterm babys inability to handle bilirubin load arising primarily from the immaturity of their conjugating enzyme systems. [10-12] The UDPGT activity of a term baby functions at 1% of adult values while that of a preterm at 34 weeks functions at less than 0.01%. [10-12] Intrauterine accumulation of meconium in the gut contains about 100-200mg of bilirubin per 100g of meconium at birth and 50% of this bilirubin is unconjugated. [10] Furthermore, preterm babys have immature enteric innervations that permit retention of this meconium within the gut giving rise to the full effect of enterohepatic circulation and thereby increasing the preterm babys bilirubin load. [10-12]

History of jaundice that required an intervention in siblings may help identify certain genetic factors contributing to development of hyperbilirubinaemia in certain families or population groups. G6PD deficiency is one of such familial conditions, however, no significant relationship was found between history of jaundice in siblings, G6PD status and severity of hyperbilirubinaemia. This finding is supported by a study in Singapore which also showed no significant relationship between G6PD deficiency and history of jaundice in siblings but agreed to the fact that the presence of additional genetic factors can increase the risk of developing severe hyperbilirubinaemia as a result of other gene interactions. [13, 14] Although, we did not establish a statistical relationship between history of jaundice in siblings, severity of hyperbilirubinaemia and G6PD status, it is important that this history is obtained to serve as a pointer to other risk factors for neonatal hyperbilirubinaemia so they can be monitored and managed early and appropriately.

Glucose-6-phosphate dehydrogenase status in relation to birth weight and severity of hyperbilirubinaemia did not demonstrate any statistical significance. Shah *et al* corroborated this finding by reporting that low birth weight is rather a risk factor for development of severe hyperbilirubinaemia as it is often exaggerated by inadequate breast milk intake known to cause breast feeding jaundice but has no effect on the

G6PD status of these individuals. [13] Few studies with inconsistent results have been carried out on G6PD deficiency in low birth weight neonates [13, 14] A research by Herz *et al* reported a contrasting finding of higher G6PD activity in neonates with low birth weight than their normal counterparts but the reason for this increase is still not clear. [15] Irrespective of the lack of relationship between weight and G6PD status in this study, weight should be monitored because its reduction may be associated with breast feeding jaundice that could further exacerbate hyperbilirubinaemia as demonstrated in this study. It is also important to identify those who are low birth weight because most of them are usually preterm babies who are more susceptible to developing bilirubin encephalopathy at lower serum bilirubin levels. [15]

Conclusion

Aetiology of hyperbilirubinaemia in neonates is multifactorial with the potential of interacting and a consequent severe hyperbilirubinaemia. Considering the deleterious effect it can have on neonatal outcome, factors with these potentials must be monitored and necessary action taking to avert neonatal morbidity and mortality.

Limitations

Several factors like sepsis, blood group incompatibilies and membranopathies can increase the severity of hyperbilirubinaemia in neonates and only few were considered this study.

Recommendations

Machinery for increased public awareness on the multifactorial causes, how to detect jaundice especially in neonates and its deleterious effect should be increased. Neonatal screening for sepsis, G6PD deficiency, red blood cell specific antigens and antibodies among many should also be instituted in our tertiary health care institutions with the aim of reducing morbidity and mortality among the neonatal age groups. Further studies' involving a larger population is recommended.

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COMPARISON OF THE KNOWLEDGE OF IONIZING RADIATION AMONG RADIO-DIAGNOSTIC STAFF OF SECONDARY AND TERTIARY HOSPITALS IN JOS.

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ABSTRACT

Background: Adequate knowledge of not only the benefits in clinical use but also of the potential dangers of ionizing radiation is crucial among staff of radio-diagnostic departments. This balance properly equips the staff and impacts professional practice. The level of such knowledge can be verified among the various cadre of staff in a radio-diagnostic department and comparison madebetween different tiers of health institutions.

Methodology: A cross-sectional study was conducted in 2 tertiary hospitals and 2 secondary hospitals in Jos, Plateau State, Nigeria between August 2019 and October 2019. All staff of radio-diagnostic departments of the 4 hospitals filled up a distributed questionnaire sheet. The semi structured, validated and self-administered questionnaire included parts comprising questions about the socio-demographics of the included subjects and on knowledge of ionizing radiation. The retrieved questionnaires were scored and graded and recorded. The data were analyzed using SPSS version 23.

Results: A total of 60 staff of Radio-diagnostic departments of the involved hospitals participated in the study, made up of 47(78.3%) males and 13(21.7%) females with age range between 24 and 57 years and a mean age of 39 ± 11.2 years. Fifty one (85%) of the participants were staff in the tertiary hospitals while 9 (15%) were in the secondary hospitals. Most of the staff who participated in the study had a good knowledge of ionizing radiation (47; 78.3%). The proportion of participants with good knowledge of ionizing radiation was higher among the radio-diagnostic staff in the tertiary hospitals (40/51; 78.4%) compared to those in the secondary hospitals (7/9; 77.8%). This difference between the staff in the two categories of health institutions was however not statistically significant, χ^2=0.0019, p=0.965.

Conclusion: Sufficientbasic knowledge of ionizing radiation subsists among the radio-diagnostic staff of secondary and tertiary hospitals in Jos.

Key Words: Comparison, Knowledge, Ionizing, Radiation, Secondary, Tertiary, Hospital.

INTRODUCTION

The discovery of X-rays in 1895 by Wilhelm Conrad Roentgen which won him the Nobel Prize for Physics 6 years later shaped a revolution in the field of medicine.[1] During the following years, the inherent dangers in radiation were brought to the fore with such findings as skin erythema and radiation burn.[2] Owing to the recognized harmful effects on experimental subjects and the health concern to staff and patients, changes in designs and various modifications in the production and use of X-rays had to be instituted for the safety of radiation staff and patients. Workers in a radiation department have an increased risk for radiation exposure than the general hospital population.[3] These group including Radiologists, Radiographers, Physicists, Biomedical Engineers, Darkroom Technicians, X-ray Assistants and Radiation Nurses also constitute the largest single group of workers occupationally exposed to artificial sources of radiation. Such artificial sources of radiation have also continued to vary and increase over the years with miniaturization units like mobile x-ray and mobile CT-scan machines and multiplication units like multi-slice CT scanner.[4]

It is usually assumed that staff in such department will have adequate knowledge about ionizing

radiation and its effects, acquired during training as part of their academic curriculum or as pre-employment or continuous education/in-service staff training to enhance capacity. Also, an orientation programme is usually organized for new staff on the basics of radiation protection to enable them gain knowledge. However, such expected knowledge by radiation staff remains just an assumption until verified.

The study aims to compare the level of knowledge of ionizing radiation among staff of radio-diagnostic departments of 2 tertiary hospitals - Jos University Teaching Hospital (JUTH) and Bingham University Teaching Hospital (BhUTH), and 2 secondary hospitals- Plateau Specialist Hospital (PSH) and Our Lady of Apostles Maternity (OLAM) all within Jos metropolis.

METHODOLOGY

JUTH, BhUTH, PSSH and OLAM are about 500, 180, 150 and 100 bedded hospitals respectively. These hospitals together harbor the largest concentration of radiation workers in Plateau State made up of staff of various cadre and units in the Radio-diagnostic departments of the 4 hospitals who were the target population for the study.The staff population of the Radio-diagnostic departments was about 75 in number, made up of 50 staff in JUTH, 10 staff in BhuTH, 10 staff in PSSH and 5 staff in OLAM.

The sample size was determined using the formula for comparison of proportions when conducting a comparative cross sectional study with the minimum sample size calculated to be 32 for each group.However, total sampling was applied in view of the small sample size and all available and willing staff of radio-diagnostic departments in the named hospitals (totaling 60)participated in the study.

An anonymous, semi-structured, self-administered questionnaire was designed and validated following review of templates of previous validated studies.[5,6]**T**he objectives of the study were explained to the participants before distribution of the questionnaire. The questionnaire included parts comprising questions about the demographics of subjects including their educational qualification, place of work and years in service, as well as parts on questions about the knowledge of ionizing radiation among the staff. Responses to the questions on knowledge of ionizing radiation were to be provided on a Likert-style scale in which the respondents were to select and tick only one box. The scale ranged from “Agree Strongly” (AS), “Agree” (A), “Not Certain” (NC), “Disagree” (D), and “Disagree Strongly” (DA).

All filled questionnaire were retrieved from the various Radio-diagnostic departments. The responses were scored and graded. The points were awarded for ticked boxes as AS-5; A-4; NC-3; D-2; DS-1, for appropriateness of the responses starting from the left and AS-1; A-2; NC-3; D-4; DA-5, for appropriateness of the responses starting from the right. No response attracted 0 point. This gives a minimum score of '0' and a maximum score of '30' points. The participants that scored 21points (70%) and above were considered as having 'good' knowledge, while those that scored less than 21 were graded as having 'poor' knowledge.

Data analysis was performed using software SPSS version 23. Definite variables are shown as percentages and frequencies and results were presented in Tables. All levels of significance were set at $p < 0.05$.

Ethical approval was obtained from the Ethical boards of all the included hospitals.

RESULTS

A total of 60 staff of Radio-diagnostic departments of the involved hospitals participated in the study. These are made up of 47(78.3%) males and 13(21.7%) females. Fifty one (85%) of the participants were staff in the tertiary hospitals (JUTH 46; BhUTH 5) while 9 (15%) were in the secondary hospitals (PSSH 6; OLAM 3). The age of the participants ranged from 24 years to 57 years with a mean age of 39 ± 11.2 years. There were more respondents in their fifth decade in the secondary hospitals (4/9; 44.4%), while the modal age group of the respondents in the tertiary health facilities was the third decade (16/51; 31.4%). More staff with years in service of less than 10 years participated in the study (33; 55%) with most in this category found working in the tertiary hospitals. Those with less than 10 year stay in the present department were also found more in the tertiary centers (37; 61.7%). The highest educational qualification among respondents in the secondary hospitals was Higher Diploma while it was a Post graduate Medical Fellowship in the tertiary hospitals. The highest cadre staff in the

secondary hospitals were the Radiographers (3; 33.3%) and the highest cadre staff in the tertiary hospitals were the Consultants (7; 13.7%) (Table 1)

Table 1: Socio-demographic Characteristics

Socio-demographics	Health Facility		Total (%)	X^2	P - Value
	Secondary	Tertiary			
Age (Years):					
21 – 30	1	16	17(28.3)	5.2108	0.266
31 – 40	1	14	15(25.0)		
41 – 50	4	14	18(30.0)		
51 – 60	3	6	9 (15.0)		
>60	0	1	1 (1.7)		
Gender:					
Female	3	10	13(21.7)	0.8491	0.357
Male	6	41	47(78.3)		
Qualification:					
SSCE	1	2	3 (5.0)	14.1363	0.049*
Technician	3	4	7 (11.7)		
OND	4	8	12((20.0)		
Degree/HND	1	19	20(33.3)		
MBBS	0	12	12(20.0)		
Fellowship	0	6	6 (10.0)		
Professional Cadre:					
X-ray Assistant	4	2	6 (10.0)	30.2148	0.000*
Darkroom Technician	2	12	14(23.3)		
Physicist	0	3	3 (5.0)		
Resident Doctor	0	8	8 (13.3)		
Intern-Radiographer	0	18	18(30.0)		
Radiographer	3	1	4 (6.7)		
Consultant	0	7	7 (11.7)		
Years in Service:					
< 10	2	31	33(55.0)	4.5963	0.032*
? 10	7	20	27(45.0)		
Years in Department:					
< 10	2	37	39(65.0)	8.5168	0.004*
? 10	7	14	21(35.0)		

Mean age: 39 ± 11.2 years

Differences in Academic qualification and Professional cadre between staff of secondary and tertiary health facilities, significant at 5%, were noted. Significant difference was also seen in the number of years in service and years spent in the present department between the two hospital categories, with more of the staff serving and staying longer than 10 years found in the secondary hospitals.

Table 2: Comparison of Knowledge of Ionizing Radiation among Radio-diagnostic staff

Level of Knowledge	Health Facility				Total (%)	X^2	P-value
	Secondary		Tertiary				
	PSSH	OLAM	JUTH	BhUTH			
Poor	1	1	10	1	13 (21.7)	0.0019	0.965
Good	5	2	36	4	47 (78.3)		
Total	9		51		60 (100)		

The results showed that most of the Radio-diagnostic staff who participated in the study had a good knowledge of ionizing radiation (47; 78.3%). The proportion of participants with good knowledge of ionizing radiation was higher among the radio-diagnostic staff in the tertiary hospitals (40/51; 78.4%) compared to those in the secondary hospitals (7/9; 77.8%) (Table 2). This difference between the staff in the two categories of health institutions was however not statistically significant, χ^2=0.0019, p=0.965.

Table 3 : Association between Socio -demographics and Knowledge of Ionizing Radiation in Secondary Health Facilities

Socio-demographics	Knowledge		Total	X^2	P - Value
	Poor	Good			
Age (Years):					
21- 30	0	1	1	5.1429	0.162
31 - 40	0	1	1		
41 - 50	0	4	4		
51 - 60	2	1	3		
>60	0	0	0		
Gender:					
Female	0	3	3	1.2857	0.257
Male	2	4	6		
Qualification:					
SSCE	1	0	1	5.1429	0.162
Technician	1	2	3		
Diploma	0	4	4		
Degree/HND	0	1	1		
MBBS	0	0	0		
Fellowship	0	0	0		
Professional Cadre:					
X-ray Assistant	2	2	4	3.2143	0.200
Darkroom Technician	0	2	2		
Physicist	0	0	0		
Resident	0	3	3		
Inter-Radiographer	0	0	0		
Radiographer	0	0	0		
Consultant	0	0	0		
Years in Service:					
< 10	0	2	2	0.7347	0.391
? 10	2	5	7		
Years in Department:					
< 10	0	2	2	0.7347	0.391
? 10	2	5	7		

No significant association was found between the socio-demographics and knowledge of ionizing radiation in the secondary hospitals.

Table 4 : Association between Socio-demographics and Knowledge of Ionizing Radiation in Tertiary Health Facilities

Socio-demographics	Knowledge		Total	X^2	P - Value
	Poor	Good			
Age (Years):					
21- 30	2	14	16	3.9202	0.417
31 - 40	3	11	14		
41 - 50	3	11	14		
51 - 60	3	3	6		
>60	0	1	1		
Gender:					
Female	4	6	10	2.498	0.114
Male	7	34	41		
Qualification:					
SSCE	0	2	2	13.0145	0.072
Technician	2	2	4		
Diploma	4	4	8		
Degree/HND	2	17	19		
MBBS	2	10	12		
Fellowship	0	6	6		
Professional Cadre:					
X-ray Assistant	1	1	2	10.547	0.103
Darkroom Technician	6	6	12		
Physicist	1	2	3		
Resident Doctor	1	7	8		
Inter-Radiographer	1	17	18		
Radiographer	0	1	1		
Consultant	1	6	7		
Years in Service:					
< 10	5	26	31	1.3827	0.240
? 10	6	14	20		
Years in Department:					
< 10	7	30	37	0.5594	0.454
? 10	4	10	14		

No significant association was found between the socio-demographics and knowledge of ionizing radiation in the tertiary hospitals.

DISCUSSION

There were much more staff participants in the tertiary health institutions than in the secondary counterparts (51 and 9 respectively). This apparently relates to the employer capacity in our setting. While the two tertiary institutions are government owned and funded, the two secondary hospitals are privately owned and funded. Jos University Teaching Hospital (JUTH), a Federal Government parastatal, alone, provided 46 (76.7%) of the respondents in the study. The import of this however is that limited hands are left to render middle level radio-diagnostic services to the teeming population of patients expected in the secondary hospitals with the attendant heightening of the radiation related health risks and hazards to the few staff.

The mean age of the respondents in the study was 39 ± 11.2 years with a range of 24 to 67 years, both extremes being associated with the tertiary health facilities. The presence of younger staff participants who were engaged in internship programs and also of the senior cadre staff saddled with the teaching and training that go on in these institutions account for this.

Staff who have spent more than 10 years both in service and in stay in the present department were found to be more in the secondary hospitals than for tertiary hospitals (Table 1). This again corroborates the comparative youthfulness of the staff population in the tertiary hospitals and the transitional characteristics, with an appreciable number of staff in this training centers spending between one year and six years for their internship and residency programs. The more permanent nature of the engagement in the secondary hospitals should spur continuous improvement in knowledge and risk management measures by staff of radio-diagnostic departments.

The highest cadre of staff in the secondary hospitals were the Radiographers (3; 33.3%) while the highest cadre of staff in the tertiary centers were the Consultants (7; 13.7%). Other cadre of staff that were found in the tertiary hospitals but not in the secondary centers include the Resident Doctors and the Medical Physicists. The compliment of staff of various cadres in the tertiary hospitals should ostensibly translate to better integration and quality in service in the radio-diagnostic units including projection and adherence to set rules in radiation protection. This may however not be the case as other complicating factors may play out in our limited resource setting.

The results showed that most of the radio-diagnostic staff who participated in this study had a good knowledge of ionizing radiation (78.3%). The proportion of participants with good knowledge of ionizing radiation was higher among staff in the tertiary hospitals (78.4%) compared to those in the secondary hospitals (77.8%). There was however no statistically significant difference in the knowledge of ionizing radiation between radio-diagnosis staff of secondary and tertiary hospitals χ^2=0.4151, p=0.519 (Table 2) Same basic knowledge of ionizing radiation and its effects is expected to be taught in the certified institutions involved in the training of the various cadre of radio-diagnostic staff irrespective of geographical location. Unanticipated disruptions in the school calendar and curriculum not infrequently seen in developing nations as in our setting may however play a negative role in the knowledge base of individual staff. Radiation workers need training and re-training on diagnostic and therapeutic uses of ionizing radiation in medicine as applicable in their work environment as these workers sometimes do not have sufficient knowledge about the risks of being exposed to radiation and the criteria that should be taken into consideration to minimize those risks.[7] Findings from a number of studies have emphasized on continuous occupational education for medical radiation workers to improve their knowledge and capacities of radiation protection issues and appropriately manage radiation exposure.[8,9] A high level of knowledge was found among radiographers regarding the dangerous effects of ionizing radiation in the study carried out in Lagos, Nigeria.[10] Another study involving radio-diagnostic nurses showed a high level of knowledge and attitude among the experienced nurses toward radiation hazards and protection.[5]

No significant association was found at p-value of 5% between any of the specific socio-demographics and knowledge of ionizing radiation among the respondents in secondary health facilities and in the tertiary health facilities. (Tables 3 and 4) This is an interesting finding in view of other reports to the contrary. Shabani et.al[11] found that the place of practice affected the knowledge, attitude and practice level of radiation protection among the staff of Interventional radiology units in Iranian health care centers. Awosan et.al[12] reported that a significantly higher proportion of

professionals such as doctors, nurses and imaging scientists had a good knowledge of radiation hazards compared with administrative and other supporting staff. However, Famurewa et.al[13] reported poor level of awareness of the basic principles of radiation protection and patients' exposure in a study among doctors in Ile-Ife, Nigeria, while Booshehri et.al[14] reported poor knowledge of radiation protection among dentists in Yazd dental office.

CONCLUSION

Sufficient basic knowledge of ionizing radiation subsists among the radio-diagnostic staff of secondary and tertiary hospitals in Jos. Though the proportion of participants with good knowledge of ionizing radiation in the study was higher among staff in the tertiary hospitals when compared to those in the secondary hospitals, the difference was however not statistically significant.

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THE PRACTICE OF HEPATOCELLULAR CANCER SURVEILLANCE IN NIGERIA

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ABSTRACT

Background

Hepatocellular cancer is a disease of global and public health importance due to the widespread distribution of risk factors and associated high case fatality. Hepatocellular Cancer (HCC) in Sub-Saharan Africa is commonly seen among the younger age groups (<45 years) who present mostly in the terminal stage, when the disease is not amenable to any curative therapy.

Hepatocellular Carcinoma surveillance employs the use of simple, cheap and readily available investigations, to detect early curable cancer in individuals with risk factors for HCC.

Objectives

The aim of this study is to assess the practice of hepatocellular cancer screening among physicians.

Methodolgy

This is a nationwide online survey carried out among physicians who care for patients with HCC. A questionnaire was sent out via a web link to all consenting doctors in Nigeria. The responses were collated in a cloud-based application and data was analysed using Epi-info version 20.

Results

A total of 218 respondents, 142 were males (65.1 %) with a mean age of 37.6 ± 5.7 years. The modal age group was 31-40 years 153 (69.5%). The main factors considered as a hindrance to surveillance were; the cost of the tests (57.7%), failure of return of patients (50.5%) and not being aware of a surveillance program (45.2 %). The majority of the respondents were Gastroenterologists and Family Physicians. 54% of the gastroenterologists and 64% of the family physicians have never offered HCC surveillance to their patients.

Conclusion

This survey highlights a knowledge gap in HCC surveillance among physicians. There is a need to make HCC surveillance a daily routine among patients at risk by all physicians.

Keywords: Surveillance, Hepatocellular Carcinoma, HBV, HCV, Cancer screening.

Introduction

Hepatocellular carcinoma (HCC) is a disease of public health significance. It is the fifth most common cancer and the second cause of cancer related death globally.(1)Fortunately, the most common causes of HCC are preventable. According to the GLOBOCAN in 2018, there were 781,631 deaths globally and Nigeria accounted for 68,716 deaths from HCC (2). HCC is an aggressive tumor with high mortality which is further confounded by late presentation when it is not curable. Conversely, earlier stages of HCC are mostly asymptomatic making early detection of the tumor difficult.

Sub-Saharan Africa and East Asia (especially China) together account for about 85% of all cases of HCC where hepatitis B, C are hyper-endemic.(1) In these regions, the incidence to mortality ratio is one.(3) Some of the identified reasons may be linked to myriad of factors that are considered to cause HCC such as high prevalence of hepatitis B which is 13.6% in Nigeria,(4) inadequate screening and appropriate treatment for viral hepatitis, poor utilization of screening protocol among patients at risk of HCC, limited resources for treating early HCC when detected. Moreover, the average survival from HCC in most sub-Saharan African countries is 2.5 months while in Nigeria it is 4 months. (5,6)

HCC surveillance offers the benefit of early detection of tumors and increases survival outcome in patients at risk.(7) It has been established to improve early tumor detection (odds ratio [OR] 2.08, 95% CI), curative treatment (OR 2.24, 95% CI) and survival (OR 1.90, 95% CI) (8). However, in Nigeria despite high endemicity of hepatitis B, C, and liver cirrhosis, HCC surveillance is not a common practice.(3) Globally, the uptake of surveillance is only about 20% even though in real life practice its importance cannot be overemphasized.(9) In this study, we set out to identify the factors that affect the implementation of HCC surveillance in Nigeria.

Objective

The aim of this study is to assess the practice of HCC screening among Nigerian physicians.

Methodology

This was a nationwide online survey carried out among physicians who care for patients with viral hepatitis, liver cirrhosis, and HCC. Respondents were physicians who are practicing in any of the six geopolitical zones of the country.

A questionnaire was designed on the survey monkey website. It consisted of 23 questions. This included the demographics of the respondents, setting of clinical practice, monthly average of viral hepatitis and HCC patients, and practice of HCC surveillance. A web link was subsequently generated and shared by investigators via online medium. Respondents were introduced to the purpose of the survey before proceeding to the survey proper.

Responses were collated in the cloud-based application and data was analyzed using Epi-info version 20 and Survey Monkey analyze data tool.

Results

Among the 218 respondents, 142 were males (65.1 %) with a mean age of 37.6 ± 5.7 years. The modal age group was 31-40 years 153 (69.5%), while 41-50, below 30 years and over 50 years constituted 17.75%, 9.1%, and 3.2% respectively.

Respondents were from all 6 geopolitical zones of Nigeria with modal distribution from North central 24.1 %. The distribution pattern is depicted in table 1 below:

Table 1: Distribution of respondents by geopolitical zones.

ANSWER CHOICES	RESPONSES	
North West	18.06%	39
North East	6.48%	14
North Central	24.07%	52
South South	23.15%	50
South East	11.11%	24
South West	17.13%	37
Total Respondents: 216		

Out of the 160 respondents (74.1%) who routinely manage hepatitis B patients only 28.7% were Gastroenterologists and trainee Gastroenterologists (GI specialists), while 15.6% were Family Physicians and trainee Family Physicians (Family Medicine specialists), and the rest cut across other specialties. Similarly, 144 respondents manage hepatitis C (66.7%) among which GI specialists accounted for 29.2%; Family Medicine specialists 15.3%; others specialties were 55.5%.

Over 50% and 78% of respondents that manage hepatitis B and C have less than 10 a month respectively. Over 73% of respondents see on average less than 10 HCC patients a month while over 21% have 10-20 patients, 3.37% have between 20-30 with only 2(0.93 %) having more than 50 HCC per month.

Predominant diagnostic methods employed by respondents for HCC were ultrasound (82.86%), clinical (78.57%), other methods are shown in Figure 1.

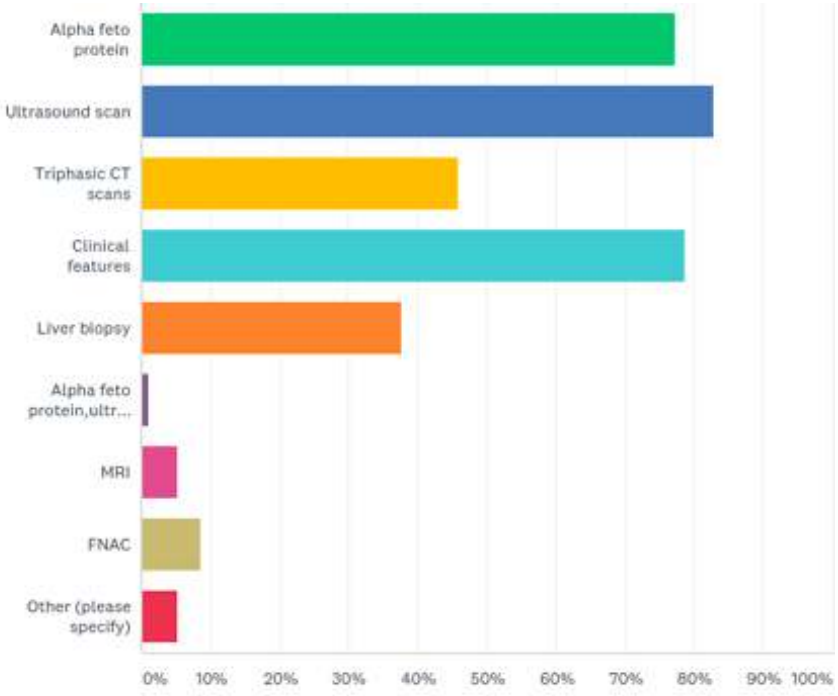

Figure 1.Methods of diagnosis of HCC among survey participants.

Most of the respondents see their HCC patients in advanced stage as shown in table 2 below:

Table 2.Distribution of BCLC STAGE at presentation of HCC patients

BCLC stage	Percentage	Frequency
0	2.35	5
A	4.69	10
B	12.68	27
C	30.99	66
D	27.23	50
I DON'T KNOW	59.62	127
TOTAL		213

Over 51% of 213 respondents do not know about HCC surveillance including GI specialists 25.2%, and Family Medicine specialist 13.6%. Similarly, 69.59% of respondents do not know about Nigerian guidelines for HCC surveillance. Only 24.65% of respondents offer routine surveillance to their patients, however, over 44% of respondents never offer such services among which majority see fewer cases per month. 22.6% of Gastroenterology specialist offer surveillance always while 33.3% said to have never offered it. On the other hand, 11.3% of family medicine specialist offer surveillance always and 17.7% of them said to have never offered it.

Most respondents prefer abdominal ultrasound scan (USS) and serum alpha fetoprotein(AFP) as the preferred surveillance modality for all participants as shown in figure 2 below:

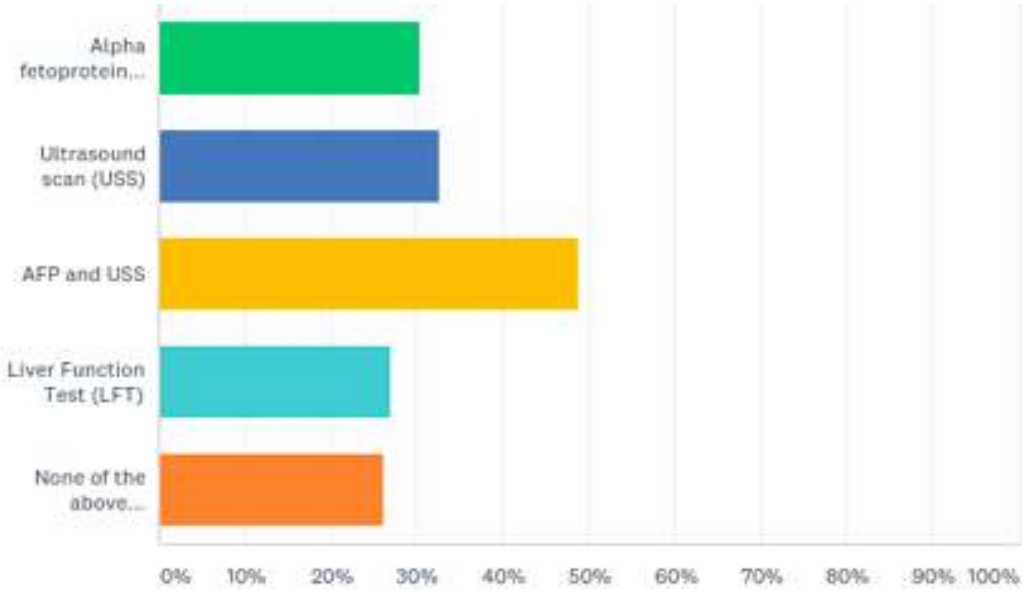

Fig.2 Surveillance method used by study participants

Majority of the respondents agree that surveillance should be offered to all cirrhotics (93.4%) and that the Society for Gastroenterology and Hepatology in Nigeria(SOGHIN) should enforce a surveillance program for HCC among patients at risk (79.3%).

The predominant obstacle for HCC surveillance among respondents was non-awareness of such program. Similarly, cost and noncompliant patients also play a significant role. Other factors are shown in table 3 below:

Table 3. Factors affecting HCC surveillance implementation.

Answer choices	Responses %	Number
No time	8.65	18
Busy schedule	28.85	60
Don't trust results	12.98	27
Never detected early tumors	9.31	19
Not aware of surveillance program	45.19	94
No structured program	42.31	88
Cost of test	57.69	120
Failure of patients return	50.48	105
Unsure of cirrhotic state	9.13	19
Surveillance doesn't help	0.96	2
Others	4.81	10
Total		208

About 50% of respondents use the recommended screening modality for HCC which are USS and AFP 6 monthly. Although (32.7%) use only USS which is also recommended by the AASLD

	Don't trust results	Surveillance does not help	Unsure of cirrhotic status	Failure of return of patients	Cost of test	No structured program	No time	Not aware of surveillance	Busy schedule	Never detected a tumor in the past
Gastroenterologist	30.2	28.6	29.0	30.7	28.3	34.4	28.9	27.2	28.9	29.0
Family Medicine	16.1	15.7	16.5	16.7	18.2	13.0	15.9	13.6	17.1	18.0
General Practice	9.4	10.6	10.0	6.1	9.1	6.9	10.4	8.8	9.4	9.5
Internal Medicine	26.4	26.7	26.0	26.3	25.3	25.2	27.4	28.0	27.7	26.5
Paediatrics	2.6	2.3	2.5	3.5	3.0	1.5	2.5	4.0	1.9	2.5
Other specialties	15.1	15.7	15.5	16.7	16.2	19.1	14.4	17.6	14.5	14.0

Table 4: Factors affecting HCC surveillance by specialty (%)

Discussion

This nationwide survey involved mainly physicians at their youthful age and has clearly demonstrated the inadequacy of HCC surveillance program in Nigeria with less than a quarter of respondents offering recommended surveillance. This is similar to findings in other studies.(10) Considering lack of awareness as one of the major factors preventing HCC surveillance practice, there is a need for creating awareness among physicians about it and various modalities available. It is evident that the management of chronic viral hepatitis, liver cirrhosis, and HCC is not limited only to Gastroenterologists, but rather it cuts across various specialties, hence there is need for regular step down training and retraining of all physicians on the current local and universal protocol for managing these diseases, and capacity building on HCC screening methods across all centers because patients who were offered surveillance live longer, have better survival and better opportunities of receiving curative therapies.(11) To this end, there is a need for a structured screening program for HCC nationwide, this we suggest should be championed by SOGHIN as seen in cases of EASL, AASLD and APASL.(12–14)

Ultrasonography and AFP were considered to be the preferred HCC surveillance tools in this survey. Both are not sensitive or specific for this purpose.(15) European Association for the Study of Liver 2018 HCC guideline strongly recommends surveillance to be performed by experienced personnel in all high-risk populations using abdominal USS every six months.(12) A study done in the Middle East concluded that AFP has very poor screening and diagnostic value.(16) The EASL, AASLD and APASL guidelines currently do not recommend the use of AFP as a diagnostic tool in HCC.(12–14,17). But the AASLD recommends both Triphasic CT scan and Liver biopsy as a preferred diagnostic tool for HCC.(18,19)

The main factors considered to hindering the practice of HCC surveillance were cost and failure of patients to return for follow-ups. The average cost of USS across the country is 3000 Naira (10 US dollars) while AFP is 5000 Naira (18 US dollars) this may seem small, but when you consider the over 80% of the population of Nigeria pays for healthcare out of pocket and the percentage living on less than 2 dollars a day (20,21), it will immediately be clear that the second reason which is the failure of patients to return may not be unrelated to funds and indirectly, cost of the test.

Studies elsewhere have also identified cost as a limiting factor to the uptake of surveillance for HCC.(11) But further analysis has demonstrated that HCC screening is, in the long run, more cost effective. Implementation of HCC surveillance has been demonstrated to aid detection of early tumor. (7–9)From the survey, over half of the participants see patients who present with the advanced disease (BCLC C or D) both of which are not amenable to early cure treatment options. This further buttresses the need for a structured program to tackle the menace of HCC.(22,23)(JULES LEVIN AASLD 2018).34% of Gastroenterologists consider the lack of a structured screening to be responsible for the poor implementation of an HCC surveillance program.

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TINEA CAPITIS INFECTION AMONG SCHOOL CHILDREN IN RURAL SETTING OF JOS NORTH-CENTRAL, NIGERIA

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ABSTRACT

Background:
Tinea capitis is a common infection of the scalp and hair shaft caused by dermatophytes. It is an infection associated with low socioeconomic status and poor personal hygiene.

Methods:
This was a cross sectional study involving pupils in two public schools in rural setting with clinical features suggestive of tinea capitis. Scrapings were collected from the scalp of the pupils between September 2018 and February 2019 and subjected to laboratory analysis of microscopy and culture. The data obtained was analyzed using SPSS version 20 statistical software.

Results:
A total of 67 pupils with clinical features of tinea capitis had positive cultures in the laboratory (21.5%), most of the pupils were of age range 4-8years (56.7%) and mainly males 167(52.2%). Factors associated with spread of tinea capitis were not statistically significant except for the sharing of towel($P<0.001$). Trichophyton mentagrophyte (40.3%) was the most isolated agent of tinea capitis followed by Microsporumgypseum (31.3%)

Conclusion:
Tinea capitis infection remains a problem associated with rural settlement and poor personal hygiene. A nationwide surveillance is required to prevent the spread.

Keywords: Tinea capitis, Trichophyton mentagrophyte, Dermatophytes, Microsporumgypseum.

INTRODUCTION:

Tinea capitis is a common infection of the scalp and hair shift caused by dermatophyte fungi[1]. It is most common in children particularly in developing countries but uncommon in adults.[2,3]

Several factors including gender, age, urban/rural environment, socio-economic status, certain cultural habit and poor personal hygiene have been documented to significantly impact the development of tinea capitis. [4,5]

The spread of tinea capitis infection is enhanced by poor personal hygiene, sharing of fomites (towels), and even over-crowding.[6,7]

Several studies carried out in different parts of Nigeria have shown that causative agents of tinea capitis vary from one location to another.[8,4,9] Trichophyton schoenlenii was reported as the predominant cause of tinea capitis in Borno state whereas Trichophyton mentagrophytes as the most prevalent in South –Western Nigeria.[2,9]Nweze and Okafor documented Trichophyton tonsurans as the leading cause agent of tinea capitis in Anambra State, Nigeria.[2,6]

There are several studies on the prevalence of tinea capitis in different parts of the country but studies on the current pattern of the agents of tinea capitis in Jos North Central Nigeria are needed to also obtain information on the epidemiology of the infection.[8, 2, 4] The purpose of the current study was to determine the prevalence of tinea capitis and

identify some associated factors among school children in Jos, North –Central Nigeria.

MATERIALS AND METHODS:

The study was carried out in two public primary school in rural settings in Jos, Nigeria, among children ages 4 – 13 years.

Pupils whose parents/guardians signed consent form were recruited in the study.

Each child's scalp was examined and sites of infection was cleaned with 70% alcohol and scrapings from actively growing margins of the lesions were obtained using sterile scalpel blades for each pupil by trained laboratory personnel. The samples were collected on clean sheets of paper and then transported to the laboratory for microscopy, culture and identification.[10, 11]

Microscopy:

Microscopic examination of the specimens was performed with 20% potassium hydroxide (KOH) at x400 magnification.

CULTURE:

The samples were cultured on sabouraud dextrose agar medium (SDA) (Oxoid) and SDA supplemented with chloramphenicol and cycloheximide (Oxoid) in tubes. The inoculated tubes (slants) were incubated at room temperature (25°c to 30°c) for up to four (4) weeks.[10]

Examination and identification of fungus:

The organisms were identified by their macroscopic features and microscopic features using lactophenol cotton blue.

RESULTS:

The total number of scrapping samples obtained from the head of the pupils with lesions suggestive of tinea capitis was 312. Of these, there were 67 positive cultures (21.5%) for tinea capitis. Of the 67 pupils with tinea capitis 56.7% were of age range 4 – 8 years compared with 43.3 % of age range 9 – 13 years (P =0.89). Males had more cultures of agents of tinea capitis 52.2% compared to females 47.8% (P=0.89). Considering the number of persons in a room in each household,

agents of tinea capitis were isolated from scrapings of pupils who slept in room with four or more persons (58.2%) (P= 0.52) Table 1.

The agents of tinea capitis isolated included, in order of frequency, Trichophyton mentagrophytes, Microsporum gypseum, Trichophyton tonsurans, Epidermophyton flocossum, Microsporum audouinii and Microsporum canis (Table 2).

TABLE1: Socio-demographic characteristics and Risk factors associated with occurrence of tinea capitis infection among school children in rural settings of Jos, North-central Nigeria

FACTORS	POSITIVE	NEGATIVE	P-VALUE
AGE GROUPS			
4-8	38	135	0.89
9-13	29	110	
GENDER			
FEMALE	32	113	0.89
MALE	35	132	
NO OF PERSONS PER ROOM			0.52
≤3	28	101	
≥4	39	144	
SHARING OF BED WITH OTHER PERSONS			0.58
YES	39	131	
NO	28	114	
SHARING OF COMBS	43	162	0.77
YES	24	83	
NO			
SHARING OF TOWELS	56	147	<0.001*
YES	11	98	
NO			

Statistically significant($p < 0.05$ set as minimum level of significance)

Table2: Dermatophytes isolated from tinea capitis infection among school children in rural setting of Jos, North-central Nigeria

FUNGI	FREQUENCY	PERCENT(%)
Trichophyton mentagrophyte	27	40.3
Microsporum gypseum	21	31.3
Trichophyton tonsurans	13	19.4
Epidermophyton flocossum	3	4.5
Microsporum audouinii	2	3.0
Microsporum canis	1	1.5
TOTAL	**67**	**100**

DISCUSSION:

Tinea capitis is prevalent among pre-pubertal children and tend to spread from person to person through direct contact and known to be endemic in Nigeria.[8]

The prevalence of tinea capitis (21.5%) in this study is lower than the prevalence of 45% and 43.5% obtained in other studies in Nigeria.[2,8]

However, the prevalence in this study is higher than that obtained in other studies in Nigeria.[6,4] Several factors may account for the varying prevalence of tinea capitis in different parts of Nigeria.[2,9] These include study population, nature of settlement, poor personal hygiene, close contact with infected children at school and as well as at home.

Considering the gender of the pupils recruited for the study, the isolation rate was higher among males compared to females but this was not statistically significant (P= 0.89). This is not in agreement with findings from other studies that showed higher isolation rate among females. [29],

A possible explanation for the result may be contamination of hair clippers leading to spread of agents of tinea capitis for male infection whereas steroid-mediated inhibition of fungal growth in females by progesterone have being suggested in some studies in which more of the agents were isolated from females.[8,6,12] The sharing of bed, combs and rooms with other persons were not significantly associated with isolation of agents of tinea capitis except the sharing of towel with other members of the house (P<0.001). The role of hair dressing, styling, shaving of scalp and use of different types of hair oils in disease transmission is still conflicting and remains for future study.[13,3,14]

Based on the isolation rate, Trichophyton mentagrophyte was the highest followed by Microsporumgypseum. This is not in agreement with findings from a few other studies in Nigeria in which Trichophyton rubrum was the highest causative agent isolated followed by Microsporum canis.[15,2,9] Another study reported Microsporum audouinii as the most isolated causative agent of tinea capitis followed by Microsporum ferrugineum.[8,6] The changing pattern in the aetiology of tinea capitis in the different studies in Nigeria and some other African countries may be due to movement of persons as a result of communal crisis, type of animal husbandry and even climate change.[16, 17, 13, 12, 18, 7]

CONCLUSION: Trichophyton mentagrophyte is a significant cause of tinea capitis. This study highlights the prevalence of tinea capitis in our environment and some factors associated with the spread. However, the establishment of a nationwide surveillance on tinea capitis is necessary to develop and evaluate preventive measures.

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A REVIEW OF PRESENT MANAGEMENT OF CASTRATE RESISTANT PROSTATE CANCER

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Abstract

Prostate cancer is the most common cancer among Sub-Saharan Africans. Androgen deprivation therapy remains the mainstay for the management of advanced prostate cancer. However, treatment failure is the rule after a predictable response to androgen deprivation with subsequent development of castrate resistant prostate cancer.Several pathways in the propagation of castrate resistant prostate cancer have been elucidated,thus leading to development of novel agents in the management of this otherwise lethal disease.Importantly, most of these cellular alterations still require the presence of some, albeit lower, androgen concentrations. Consequently, it is recommended that ADT be continued for the remainder of a patient's life. This review gives a summary of the current and approved treatment options for castrate resistant prostate cancer.

Keywords

Castrate, resistant, prostate cancer, cytotoxic therapy, Immunotherapy, antiandrogen therapy

Introduction

Prostate cancer is the most common malignancy among males worldwide and is the second leading cause of cancer death among men in the United States. In Sub-Saharan Africans, it is the most common cancer, with a mortality rate more than five times higher than African-Americans.[2 3],

Hormonal treatment based on the findings by Huggins et al. remains the mainstay of treatment for advanced prostate cancer.[45], However, treatment failure is the rule after a predictable response to androgen deprivation with subsequent development of castrate resistant prostate cancer.[6]

Castrate resistant prostate cancer (CRPC) is defined, by the progression of disease despite castrate serum testosterone level (<50 ng/dl or 1.7 nmol/l). It may present as either a continuous rise in serum PSA levels with three consecutive rises in PSA one week apart, with two resulting in 50% increases over the nadir, and PSA >2 ng/ml or progression of an existing disease or the appearance of new lesions [7].

Several mechanisms have been identified as potential explanations for castrate resistant prostate cancer. These include increased sensitivity of the androgen receptor (AR) via gene amplification or over expression, alterations in coregulators that alter ligand sensitivity, androgen receptor (AR) mutations that broaden ligand specificity and confer sensitivity to adrenal androgens, cross-talk via other signalling pathways such as IL-6 and Her2-Neu,nongenomic mechanisms by which ligand-bound AR modulates transcription and alterations in steroid synthetic and androgen-metabolizing enzymes that potentiate intraprostatic androgen production [8,9,10, 11, 12, 13, 14, 15].

Importantly, most of these cellular alterations still require the presence of some, albeit lower, androgen concentrations. Consequently, it is recommended that ADT be continued for the remainder of a patient's life [16].

Clinical scenarios in castrate resistant prostate cancer include patients with rising PSA who are asymptomatic without evidence of metastasis and patients with severe cancer symptoms as a result of metastasis. These clinical situations determine and modify the treatment offered to these patients.

This review gives a summary of the current treatment options and clinical data for the treatment of castrate resistant prostate cancer.

Methodology

A systematic review of the literature was conducted, and articles published on the management of castrate resistant prostate cancer (CRPC) were retrieved. A search of the electronic

databases, including PubMed, Google Scholar and Crossref Metadata Search using the keywords castrate, resistant, prostate cancer, cytotoxic therapy, immunotherapy, antiandrogen therapy. Searches were restricted to publications in the English literature.

Management of Castrate Resistant Prostate Cancer.

Hormonal Manipulation

Patients in the transition phase of CRPC who have been on androgen deprivation therapymay benefit from secondary hormonal manipulation.

These will be in the form of addition of antiandrogen (Bicalutamide, Nilutamide or flutamide) for patients on monotherapy (luteinising hormone releasing hormone analogue) or who have had an Orchidectomy. Antiandrogen can induce a second response in almost 50% of castration-resistant prostate cancer patients. The duration of response is more than 1.5 years on average and responders have prolonged metastasis-free survival.[17, 18, 19]

The withdrawal of antiandrogen for patients who have undergone total androgen blockade, Antiandrogen withdrawal are significantly associated with both longer progression free survival and overall survival in patients with castrate- refractory prostate cancer. PSA response can be up to 30%. [20, 21, 22]

Ketoconazoleis an inhibitor of testicular and adrenal androgen biosynthesis. It inhibits17α-hydroxylase and 17,20-lyase which convert pregnenolone into androgens, and 11β-hydroxylase, which converts 11-deoxycortisol to cortisol. In a phase trial by Small et al. [23]there was an objective response in patients receiving ketoconazole. Low dose ketoconazole with replacement doses of hydrocortisone has moderate activity.[24]

Non-Metastatic Castrate Resistant Prostate Cancer (m0CRPC)

In this clinical scenario, there is a PSA rise in men who have had curative therapy for prostate cancer without clinical evidence of disease progression. This group of patients present a management conundrum.

There is no generally accepted standard care for this group of patients. Secondary hormonal treatments may be attempted. A recent study by Smith et al. using apalutamide (240mg/day), a competitive inhibitor of the androgen receptor showed significantly longer metastasis free survival and time to symptomatic progression among men with nonmetastatic castration-resistant prostate cancer. The median metastasis-free survival was 40.5 months in the apalutamide group as compared with 16.2 months in the placebo group. Time to symptomatic progression was significantly longer with apalutamide than with placebo. [25]

Metastatic Castrate Resistant Prostate Cancer (mCRPC).

Only patients with detectable macroscopic metastatic disease should be considered for systemic therapy (new hormonal agents or chemotherapy). These patients should receive multimodal and multidisciplinary therapy to maximise survival and improve quality of life.

Cytotoxic Chemotherapy.

Mitoxantrone is an antitumor antibiotics that inhibits type topoisomerase. This disrupts both DNA synthesis and DNA repair. It is used for palliation of symptoms, especially pain in men with mCRPC. It does not affect the overall survival of patients or time to disease progression[26] however, there have been questions regarding its use because of the side effects profile. These effects include neutropenia and neutropenic fever, anaemia, fatigue, peripheral neuropathy, back pain and left ventricular dysfunction[27]. However, it is useful in patients who progress after chemotherapy.

Docetaxel, a taxane whose mechanism of actionis believed to be two-fold. This involves the inhibition of microtubule depolymerisation and the attenuation of the effects of bcl-2 and bcl-xL gene expression. The induction of microtubule stabilisation causes cell arrest in the G(2)M phase of the cell cycle and induces bcl-2 phosphorylation, thereby promoting a cascade of events that leads to apoptotic cell death. A landmark study by Tannock et al. in 2004 demonstrated the efficacy of docetaxel in the management of castrate resistant prostate cancer. In this three-arm study, patients were randomised to receive a docetaxel three weekly regimen (75mg/m^2) plus low-dose prednisone (10mg daily), a docetaxel weekly (30mg/m^2 for 5 or 6 weeks) plus prednisone, or mitoxantrone (12mg/m^2 3weekly) plus prednisone.

The median survival was 16.5 months in the mitoxantrone group, 18.9 months in the group given docetaxel every three weeks, and 17.4 months in the group given weekly docetaxel. Among these three groups, 32%, 45% and 48% of men, respectively, had at least a 50% decrease in the serum PSA level. 22%, 35% and 31% had predefined reductions in pain; and 13%, 22% and 23% had improvements in the quality of life. Adverse events were more common in the groups that received docetaxel and the three weekly docetaxel showed better outcome than weekly docetaxel. Adverse effects of docetaxel included neutropenia, fatigue, nausea or vomiting or both, alopecia, diarrhoea, nail changes, sensory neuropathy, anorexia, changes in taste, stomatitis, dyspnoea, tearing, peripheral oedema, and epistaxis.

Cabazitaxel is a taxane. It differs from docetaxel by its weak affinity for P-glycoprotein, an ATP-dependent drug efflux pump. Tumour cells that express the glycoprotein become resistant to taxanes, limiting the effectiveness of docetaxel [28].The FDA approved itfor patients who progress post docetaxel therapy. This was based on the TROPIC study,which compared cabazitaxel and mitoxantrone in patients who progressed after docetaxel therapy. The median survival was 15·1months in the cabazitaxel group and 12·7 months in the mitoxantrone group. Median progression-free survival was 2·8 months in the cabazitaxel group and 1·4 monthsin the mitoxantrone group. The most common clinically significant grade 3 or higher adverse events were neutropenia (cabazitaxel, [82%] patients versus mitoxantrone[58%]) and diarrhoea [6%] versus[<1%]). 8% of the patients in the cabazitaxel group and 1% in the mitoxantrone group had febrile neutropenia [29].

Novel Antiandrogen Therapy.

Abiraterone is a selective, irreversible, and potent inhibitor of 17-[alpha]-hydroxylase/17,20-lyase (CYP17) enzymatic activity which is required for androgen biosynthesis in the testes, adrenal glands, and prostate tissue [30]. Abiraterone iseffective in the pre and post-chemotherapy setting for castrate resistant prostate cancer.In chemotherapy naïve patients, the median radiographic progression free survival was 16.5 months with improvement in overall survival with abiraterone-prednisolone compared to 8.3 months and 27.2months respectively with prednisolone alone. It also showed superiority over prednisone alone concerning time to initiation of cytotoxic chemotherapy, opiate use for cancer-related pain and prostate-specific antigen progression[31]. In patients receiving abiraterone acetate-prednisolone post chemotherapy with docetaxel, after a median follow-up of 12.8 months, overall survival was longer in the abiraterone acetate–prednisone group than in the placebo–prednisone group (14.8 months vs 10.9 months). PSA progression (10.2 vs. 6.6 months), progression-free survival (5.6 months vs. 3.6 months), and PSA response rate (29% vs. 6%). The improved parameters favoured the treatment group.Adverse events were frequently recorded in the abiraterone acetate-prednisolone group than the placebo-prednisolone group[32]. These included fluid retention, hypertension, and hypokalaemia.

Enzalutamide is a potent, competitive inhibitor of the androgen receptor. It also preventstranslocation of the AR from the cytoplasm to the nucleus and inhibits DNA binding, thereby impairing tumour growth. It is useful in the pre and post-chemotherapy setting. It showed obvious benefits in chemotherapy naïve patients as demonstrated by Beer et al [33]. In their study, comparing enzalutamide and placebo, the radiographic progressionfree survival at 12 months was (65% vs 14%), overall survival was (63% vs 29%). Other recorded benefitsinclude time to initiation of cytotoxic chemotherapy, the time to first skeletal-related event, a complete or partial soft-tissue response (59%vs.5%), the time to prostate-specific antigen (PSA) progression and PSA decline (78% vs 3%). Hypertension and fatigue were recorded adverse effects. In patients who have received prior chemotherapy, enzalutamide showed benefits compared to placebo. The median overall survival was 18.4 months compared to 13.6 months, reduction in the prostate-specific antigen (PSA) level by 50% or more (54% vs 2%), soft-tissue response rate (29% vs 4%), the quality-of-life response rate (43% vs 18%), the time to PSA progression (8.3 vs 3.0 months), radiographic progression-free survival (8.3 vs 2.9months) and the time to the first skeletal-related event(16.7 vs.13.3months). Adverse effects recorded includedfatigue, diarrhoea, hot flashes and seizures [34].

Immunotherapy

The immune system can respond to prostate cancer antigens. Presently there are ranges of immunotherapeutic strategies which are being developed and evaluated. The goal is the induction of de novo response or reactivation of antitumor immune responses[35].

Sipuleucel-T, an autologous cellular immunological agent, approved for clinical use, works through antigen presenting cells (dendritic cells) to stimulate T-cell immune response targeted against prostatic acid phosphatase (PAP), an antigen that is highly expressed in most prostate cancer cells.[36,27] In a study involving patients with asymptomatic metastatic castrate resistant prostate cancer, in which sipuleucel-T was compared with placebo. The median time for disease progression for sipuleucel-T was 11.7 weeks compared with 10.0 weeks for placebo. Median survival was 25.9 months for sipuleucel-T and 21.4 months for placebo. Thisstudy suggests that sipuleucel-T may provide a survival advantage to asymptomatic patients with metastatic castrate resistant prostate cancer.[38] In another study, treatment with sipuleucel-T resulted in a 4.1-month improvement in median survival and an improvement in the rate of 3-year survival (31.7% for patients receiving sipuleucel-T, as compared with 23.0% for those receiving placebo) [39].

Bone Targeted therapy

Patients with castrate resistant prostate cancer will ultimately develop skeletal related events; bone pain, pathological fracture, nerve compression syndromes and spinal cord compression. These events will occur in over 90% of the patientswho have been on androgen deprivation therapy for excess of ten years,and it is due to the effect of androgen deprivationtherapy on bone mineralisation and bone metastases [40].

Bisphosphonates are protective against skeletal related events. They act by integration into the bone matrix, by binding to hydroxyapatite crystals, with resultant inhibition of osteoclast-mediated bone resorption [41]. Zoledronic acid is the only bisphosphonate that is effective in reducing skeletal related events in men with castrate resistant prostate cancer. In a phase **III** trial, in which patients were randomised into zoledronic acid and placebo, a higher proportion of patients who received placebo had skeletal-related events than those who received zoledronic acid(44.2% versus 33.2%). The median time to first skeletal-related event was 321 days for patients who received placebo, while it was not reached for patients who received zoledronic acid. Compared with urinary markers in patients who received placebo, urinary markers of bone resorption were statistically significantly decreased in patients who received zoledronic acid. Pain and analgesic scores increased more in patients who received placebo than in patients who received zoledronic acid. Zoledronic acid at 4 mg given as a 15-minute infusion was well tolerated, but the 8-mg dose was associated with renal function deterioration.[42, 43] Other side effects include flu-like symptoms, hypocalcaemia and osteonecrosis of the jaw bone.

Denosumab is a fully human monoclonal antibody that binds RANKL, preventing RANKL from activating RANK, thereby inhibiting osteoclast activity. These decreases bone resorption and subsequently increases bone mass [44].

Denosumab was better than zoledronic acid for the prevention of skeletal-related events, and potentially represents a novel treatment option in men with bone metastases from castration-resistant prostate cancer.[45] The median time to first on-study skeletal-related event was 20·7 months with denosumab compared with 17·1months with zoledronic acid. Side effects of denosumab includedosteonecrosis of the jaw, hypocalcaemia

Radium-223 is a radioactive isotope.It mimics calcium in forming complexes with the bone mineral hydroxyapatite, which targets explicitly bone metastases.It prefers new bone around metastatic sites emitting lethal alpha particles in the tumour microenvironment which leads to doublestranded DNA damage, thereby inhibiting tumour growth.[46,47]

In a phase **III** trialwith radium-223,the median overall survival was 14.0 months in the radium-223 group and 11.2 months in the placebo group. Radium-223, as compared with placebo, was associated with a 30% reduction in the risk of death. The effect of radium-223 on overall survival was consistent. The risk for time to first symptomatic skeletal event was reduced, good PSA and alkaline phosphatase responses were noted.[48,49]It showed a low myelosuppressive effect.

Table 1: Summary of Clinical Management of Metastatic Castrate Resistant Prostate Cancer

S/N	Clinical Scenario	Recommended Treatment
1	Metastatic CRPC without Symptoms	Abiraterone acetate 1000 mg/day plus prednisone 5mg /twice daily. Enzalutamide 160mg/day. Docetaxel 75mg/m ^{2} every 3weeks plus oral prednisone 5mg twice daily.
2	Metastatic CRPC with Symptoms	Docetaxel 75mg/m ^{2} every 3weeks plus 5mg oral prednisone twice daily for 10cycles. Radium-223 every 4weeks for 6cyclesin patients with pain due to bone me tastases without visceral metastases. Abiraterone acetate 1000mg/d plus prednisone 5mg twice daily or E nzalutamide 160 mg/d may be considered as first -line therapy in patients who cannot receive or refused docetaxel
3	Metastatic CRPC who Progress after Docetaxel-Based Chemotherapy	Cabazitaxel (25mg/m^2) plus prednisone (5mg/day). Abiraterone acetate (1000 mg per day) plus prednisone (5mg twice daily). Enzalutamide (160mg/day) Radium-223 every 4weeks for 6cycles. Docetaxel plus prednisone re -exposure. (Positive initial response). Mitoxantrone plus prednisone for palliative pain relief.
4	Patients with CRPC and Bone Metastases	Denosumab (120mg subcutaneous) or zoledronic acid (4mg intravenous) every 4weeks. Daily calcium and vitamin D supplementation

PalliativeCare.

Castrate resistant prostate cancer is a progressive disease and patient will ultimately succumb to the disease process. Disease progression is epitomised by pain, obstructive uropathy, bone fractures, anaemia, coagulopathy and fatigue. Improving the quality of life of the patient and that of the caregiver is of paramount importance. Realistic goals should be set for patient care. Aggressive therapy without justifiable product should be avoided. Patient should receive adequate pain control with judicious use of analgesics (using the analgesic ladder) [50], adjuvant analgesics and steroids. Specific therapy, such as stenting, surgical decompression and radiation therapy where necessary, will provide succour and relief. Psychological, physical and spiritual support should be provided [51].

Conclusion

Castrate resistance prostate cancer is a grin disease with grave consequences for the patient. Treatment of this disease is rapidly evolving with overall survival and progression free survival in the region of months with current modalities oftreatment. Hopefully, current researches will come up with newer treatment modalities that will improve survival and improve the quality of life of patients.

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THE PREVALENCE OF GASTROINTESTINAL STROMAL TUMOUR AS SEEN IN THE JOS UNIVERSITY TEACHING HOSPITAL (JUTH), JOS, NORTH CENTRAL NIGERIA

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ABSTRACT

Background: Gastrointestinal stromal tumours (GIST) represent 1% of all malignant tumours of the gastrointestinal tract (GIT). However, it is the most common Mesenchymal tumour of the GIT with majority (40 to 60%) arising from the stomach.

Objective: To determine the prevalence of GIST among patients in Jos University Teaching Hospital between 2005 and 2012.

Methodology: Five (5) antibodies were used on the Mesenchymal tumours (CD117, CD34, Desmin, SMA and S100). Diagnosis of specific Mesenchymal tumours was based on histological patterns of the tumours on H and E stained slides and immunostaining characteristics of the tumours.

Results: Seven Mesenchymal tumours seen within the study period. This comprises of 6 GIST and 1 Leiomyosarcoma.

Conclusions: This study shows that even though GIST is a rare tumour, it is the commonest Mesenchymal tumour of the stomach. It also shows that they are commonly positive for both CD117 and Cd34.

Keywords: GIST, Mesenchymal Tumour, Gastrointestinal Tract, Stomach

INTRODUCTION

Gastrointestinal stromal tumours represents only 1% of all malignant tumours of the gastrointestinal tract (GIT).[1] It is however the most common mesenchymal tumour of the GIT with majority arising from the stomach.[1,2] GIST accounts for 2.2% of malignant gastric tumours in SEER data . It occurs most frequently in individuals over the age of 55 years, but the peak age of diagnosis is 60years, with far less than 10% occurring in individuals under the age of 40years.[3] The mean age of diagnosis in a study by Abdulkareem et al.[1] in Lagos, South western Nigeria, was 45.4 years, while that of Gillian Baker et al. in South Africa was 56 years**.** Kim et al. and Chan et al. recorded mean ages of 56.3 and 66 years respectively in a similar study in Asia.Studies in Europe by Ahmed et al. in the United Kingdom and Rbio et al in Spain showed mean age of 64 and 63 years respectively. Thomas et al in the USA also recorded a mean age 63 years which was similar to what was seen by Rbio in spain[4]. Several other studies showed mean age between 50 and 65.8 years. There is no gender predominance (M: F 1.1:1).[5]The male to female ratio seen by Kim et al. and Chan et al. were 1:1 and1:1.2 respectively, while that of Ahmed et al and Rbio et al were 1:0.9 and 1:1.0. The Studies by Thomas et al and Gillian Baker et al showed a male to female ratio of 1.2:1 and 1.25:1 respectively[4].

Histologically, GISTs are composed of either spindle cells, round (polygonal or epithelioid) cells or a mixture of the two. Pure spindle cells tumours are composed of elongate cells with scant, eosinophilic, fibrillar cytoplasm and blunt or sharp ended nuclei with or without paranuclear vacuoles. These cells are separated by variable amount of stroma that may undergo myxoid change or hyalinization. There is usually dense cellularity, but nuclear pleomorphism, cytologicatypia and mitotic figures are rare.[6] According to Corless et al, GISTs are mostly composed of spindle-shaped cells (70%), but some are dominated by epithelioid cells (10%- 20%) or may contain a mixture of both spindloid and epithelioid cells (10%-20%)[7].In a study by Sherif et al 68.5% of the tumors were composed of spindle cells, 10.5% were epithelioid cell tumours, 10.5% have both spindle and epithelioidcells, while 10.5% were unclassified.In

this same study, most of the tumours (42.1%) were seen in the upper 1/3 of the stomach, 31.5% in the middle 1/3 and 26.3% in the lower 1/3.[8] Matthews et al also had similar findings with the proximal stomach being involved in about two thirds of the patients.[9]

Gain of function mutation of the gene coding the tyrosine kinase c-KIT is seen in 75– 80% of GISTs. CD117 or c-KIT is a receptor for stem cell factor (SCF).[10] Another 8% have mutations that activate a Platelet derived growth factor receptor (PDGFR). They may show membrane, diffuse cytoplasmic or a peri-nuclear accentuation pattern for c-KIT.[10] True smooth muscle tumours and Schwannomas are consistently negative for c-KIT (CD117) and are distinguished from GISTs by positive staining for muscle and neural markers respectively.[11] Thus, with rare exception the term GIST should be reserved for those tumours that are immunohistochemically positive for c-KIT (CD117).[11] CD34 positivity is seen in 70 – 80% of GISTs (membrane pattern).[12] But unlike c-KIT, CD34 is also noted in Solitary fibrous tumours and Kaposi sarcoma. CD34 has been shown to be associated with a malignant phenotype. The expression of CD44 has been demonstrated to correlate with a better prognosis. 30 – 40% show focal or diffuse positivity for Smooth muscle actin (SMA), while very few show reactivity for Desmin (<5%) and S100 protein (<5%).[13]

Abdulkareemet al.[1] in Lagos, South western Nigeria, studied Gastrointestinal mesenchymal tumours using five antibodies; CD117, CD34, S100, Desmin and Smooth muscle actin (SMA). 41% of the tumours seen were GIST, all positive for c-KIT (CD117) and CD34. Only 30.7% of these were suspected to be GIST by routine H & E staining.From available literature, 5% of GISTs are negative for c-KIT (CD117) by immunohistochemistry.[6] These tumours have either c-KIT wild-type or harbour PDGFRA mutations. Because of that, some GISTs will be misdiagnosed without doing genetic analysis.

New gene markers discovered on gene expression arrays are now been studied to improve the diagnostic accuracy for GIST, especially for c-KIT-negative GISTs. These include DOG1 (Discovered on GIST 1), PKC-θ (protein kinase C theta) and CA II (carbonic anhydrase II).[6] DOG1 is also known as ANO1 (anoctamin 1, calcium-activated chloride channel), TMEM161A and FLJ10261. Recent studies have shown that the overall sensitivity of DOG1 Staining in GIST ranges from 75% to 100% depending on the type of antibody used.[14]

MATERIALS AND METHOD

The study was an eight year hospital based retrospective analysis of tissue blocks and slides of Gastric specimens received at the histopathology department of the Jos University Teaching hospital (JUTH) between January 2005 and December 2012. The materials for this study included hospital histopathology investigation request forms, patient case notes, duplicated copies of all despatched results, blocks and archival slides of gastric specimens received between January 2005 and December 2012.

Paraffin wax embedded tissue blocks and corresponding archival routine haematoxylin and eosin (H&E) stained slides of all gastric cancer cases were retrieved and reviewed. Fresh sections were taken from blocks for all cases that required immunohistochemical staining and where original slides were missing or damaged.

Relevant information such as age, hospital numbers, laboratory numbers and clinical details including extent of the disease was extracted from the departmental cancer registry, duplicated copies of despatched results and patient's folders from JUTH and referring hospitals.

Five (5) antibodies were used on the Mesenchymal tumours (CD117, CD34, Desmin, SMA and S100). Diagnosis of specific mesenchymal tumours was based on histological patterns of the tumours on H and E stained slides and immunostaining characteristics of the tumours. Criteria for the diagnosis of GIST are based on histology and positivity for CD117 and CD34. Positivity for Desmin and Smooth muscle actin was the criteria for the diagnosis of smooth muscle tumours.

RESULTS

Seven mesenchymal tumours were seen within the study period. This comprises of 6 GIST (Table 1) and 1 Leiomyosarcoma (2 of the GISTs were diagnosed prior to this work, without immunohistochemistry as Leiomyosarcoma). The entire GISTs comprising of 4 spindle cell variant and 2 epithelioid variant, were all positive for CD117/c-KIT, 5 were positive for CD34 while all were negative for SMA and Desmin. One of the GIST, a spindle cell variant washowever positive for S100. All the GISTs were seen in male patients within the age range of 32 to 65 years and mean age

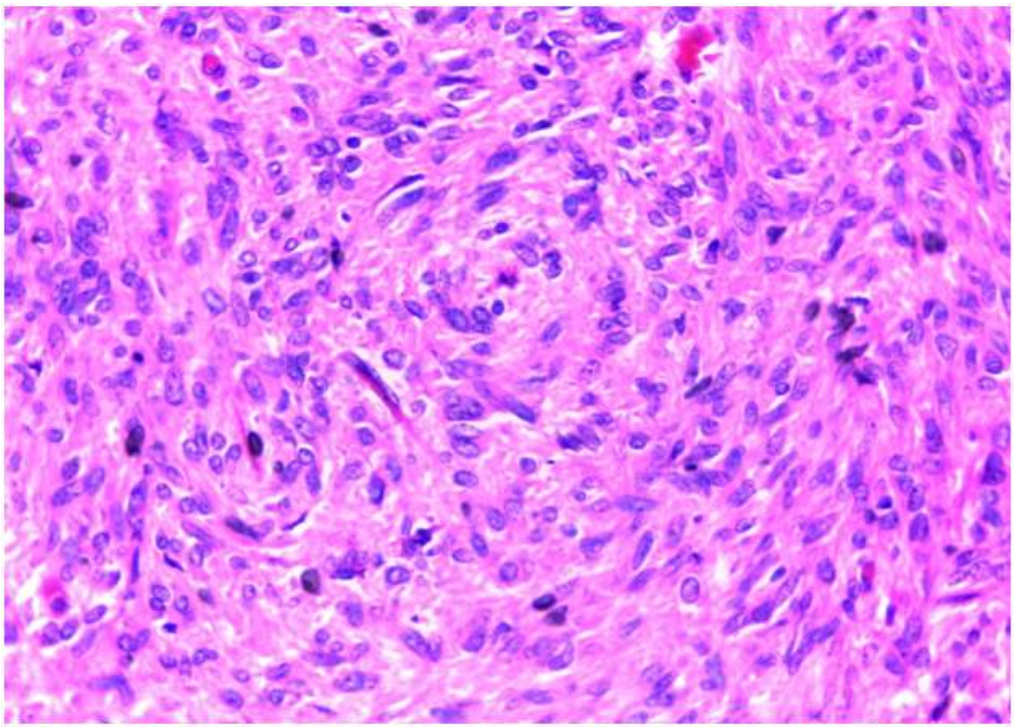
of 52.2 years. 4 out of 6 GISTs seen were located in the Gastric Antrum, while the remaining two were seen at the Gastric Corpus. The diagnosis of the Leiomyosarcoma seen in the study was based on histology on H & E and immunopositivity for Desmin and Smooth muscle Actin (SMA). This same tumour was negative for CD117, CD34 and S100.

Table 1Histopathological subtypes of gastric mesenchymal malignancies seen in J.U.T.H, Jos

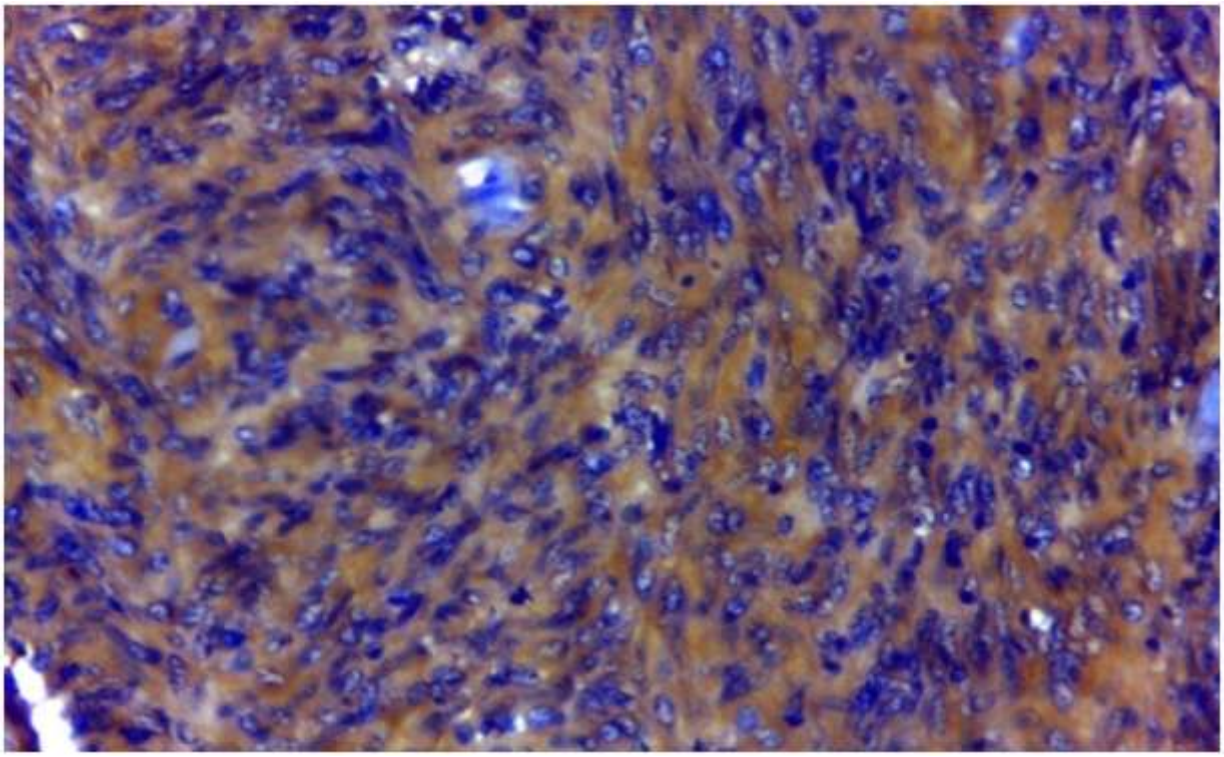
Tumour type	Frequency	Percent (%)
GIST	6	85.7
Leiomyosarcoma	1	14.3
Total	**7**	**100**

Table 2 Histopathological subtypes of gastric mesenchymal malignancies seen in J.U.T.H, Jos

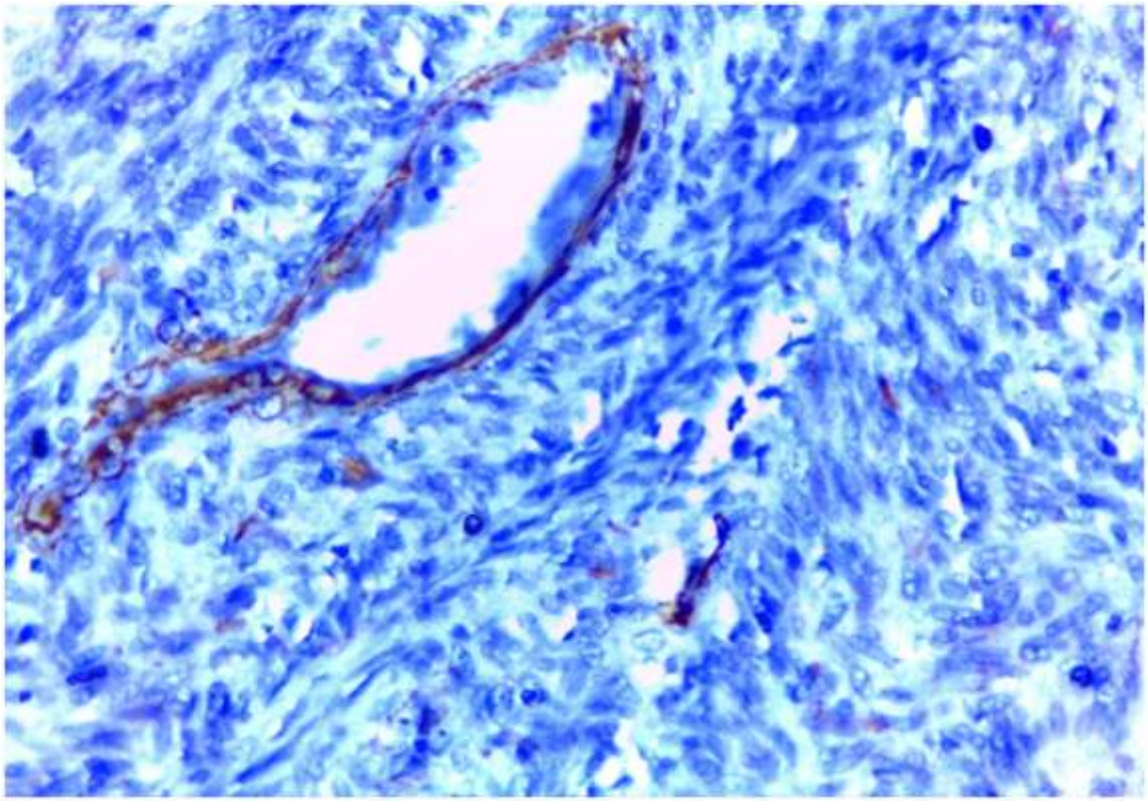
S/N	AGE(YEARS)	SEX	SITE	TUMOUR VARIANTS
1	32	Male	Corpus	Spindle
2	43	Male	Antrum	Epitheloid
3	50	Male	Antrum	Spindle
4	58	Male	Corpus	Epitheloid
5	65	Male	Antrum	Spindle
6	65	Male	Antrum	Spindle



GIST showing proliferating spindle cells with nuclear atypia and mitotic figures (H & E X 20)



Diffuse intense cytoplasmic c-KIT/CD117 staining in a case of Gastrointestinal stromal tumour (GIST) (Immunoproxidase x 40)



SMA staining only the cytoplasms of blood vessel pericytes while Gastrointestinal stromal tumour (GIST) cells has no staining (negative) (immunoperoxidase technique x 40)

DISCUSSION

There were 7 cases of malignant mesenchymal tumours seen within the study period. These comprise of 6 gastrointestinal stromal tumours (GISTs) and a Leiomyosarcoma. This is in line with other studieswhich show that GISTs are the commonest gastrointestinal mesenchymal tumours. The mean age in our study is 52.2 years. This value is similar to 56 and 56.3 years seen by Gillian et al. and Kim et al. in their studies. However, this is much higher than the 45.4 years seen by Abdulkareem et al. in her study and lower than 63, 64 and 66 years seen by Thomas et al. ,Rbio et al.,Ahmed et al. and Chan et al. in their respective studies. All the cases reported in our study were male patients. This did not correspond to most reported studies were no sex predominance was noted. 4 of the GISTs cases were of the spindle cell variant, while two were epithelioid variant. This correspond well with findings in other Studies were the spindle cell variant predominates. In our work, most tumours are located in the antrum. This does not correspond with the findings of Sherif et al. and Mathews et al who reported majority of cases to be located in the upper gastric portion.All the GISTs seen in our study were positive for c-KIT/CD117, 1 was negative for CD34 while one was positive for S100. These are all seen in most studies.

CONCLUSION

In conclusion, the commonest gastric mesenchymal tumour is the Gastrointestinal stromal tumour (GIST) and itsaccurate diagnosismay require the use of immunohistochemistry. All GISTs seen in our work were positive for c-KIT. This confirms that most GISTs are positive for c-KIT, with few exceptions where the PDGFR mutation may be involved.This work has also concurred with other studies for showing the commonest variant to be the spindle cell type and that it is a disease of people around the age of 50 to 60 years

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DETERMINATION OF RELATIONSHIP BETWEEN THYROID GLAND VOLUME AND PARITY, SMOKING HABITS AND ALCOHOL CONSUMPTION.

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ABSTRACT

Objective: This study is aimed at investigating possible relationship between thyroid gland volume, parity, smoking and alcohol consumption.

Background: The thyroid gland is one of the largest endocrine glands in the body that produces thyroid hormones, principally thyroxine (T_4) and triiodothyronine (T_3). These hormones regulate the rate of metabolism and control the growth and rate of function of many other systems in the body. Any factor that affects thyroid gland volume, would affect production and function of thyroid hormones in the body.

Materials And Methods: LOGIC 5 ultrasound machine, 10MHZ linear transducer and ultrasound gel were used. Ultrasound of the neck in patients that fulfill recruitment criteriaand presenting to radiology department between 2011 and 2012, were evaluated for the study. Demographic data, indications and findings were evaluated.

Results: A total of 400subjects were involved in the study, with more female non-smokers(250) and non-alcoholics(231) than males. There was variation in size of thyroid gland in non-alcoholics (Mean thyroid volume = 5.58±2.60)compared to alcoholics(Mean thyroid volume = 6.14±2.74), indicating the goitrogenic effect of alcohol.There is an increase in thyroid volume with increase in smoking, though not significant. Parity does not have significant effect on thyroid volume in this study, with P-value of 0.128.

Conclusion: Cigarette smoking, alcohol and pregnancy are associated with increase in thyroid volume. This has been attributed to the goitrogenic effect of nicotine, alcohol and pregnancy hormones. The effects of nicotine and alcohol on thyroid gland, is seen in both males and females.
Although pregnancy is noted to cause increase thyroid volume, there was increase in volume with increase in parity in this study.

Key Word: Determination, Thyroid volume, Parity, Smoking and Alcohol consumption.

INTRODUCTION

Ultrasound (US) provides the best anatomical representation of the thyroid gland. Using high-resolution (10 MHz) transducer, modern machines provide excellent spatial resolution and allow nodules as small as 2-3mm to be detected. Laboratory values of T3, T4 and TSH may be **deranged and thyroid gland appears normal on ultrasound scan.** Ultrasound is simple, non-invasive, readily available, real-time, accurate, and cost effective appearing to be more suitable in tropical Africa for thyroid imaging where more sophisticated modern imaging techniques may not be readily available asdocumented by Ahidjo et.al[1].

Scans can be video-recorded, stored and reproduced whenever needed. They can also be repeated as many times as possible, with no hazards of ionizing radiation. No special preparation is required. It is well suited for most individuals. No contrast administration is required. Besides the quality of ultrasound images compare favorably to those of other imaging modalities as documented in a previous study by Martin P et.al[2]. The data generated by this study will provide the very much needed baseline in the diagnosis, treatment and prognosis of thyroid diseases in this environment. No known work was done for determination of thyroid volume using 10MHZ

transducer and analyzing the thyroid function (which was used as exclusion criteria) of the individuals in a highland part of Nigeria. This work was done on the above premise. Fatima et al[3] in a prospective study to investigate the influence of smoking on sonographically determined thyroid gland volume and echo-texture in a large randomly selected group of 500 healthy subjects of both sexes from a non-iodine deficient area, discovered that, in 257 non-smokers the mean value of the right thyroid lobe volume and the left thyroid lobe volume were 7.97 ± 5.27 ml and 6.94 ±4.82 ml respectively, whereas they were found to be 8.68 ± 5.97 ml and 7.03 ± 3.05 ml respectively in 243 smokers. Thyroid gland volume was higher in male and female smokers than in non-smokers ($p > 0.05$).They concluded that smoking does affect mean thyroid gland volume in smokers and has no influence on the echogenicity or echo-texture of the thyroid gland.

Alcohol consumption affects the size of thyroid gland.Valeix[4] et al noted that alcohol intake was associated with higher thyroid volume in males and females irrespective of iodine status.They observed an increase dose-response relationship between alcohol intake levels and thyroid enlargement in both males and females.Alcohol consumption was strongly associated with a higher risk in females.

Pregnancy acts as a goitrogen in women.The thyroid does not shrink to its former size after delivery.Mario[5] et al evaluated the effect of parity on 208 nongoitrous healthy women.The mean thyroid volume increased progressively with number of parity.The increment was statistically significant. They observed that the goitrogenic effect of parity in moderate iodine deficiency is not reversible.They are of the opinion that iodine supply during pregnancy should be increased in conditions with moderate iodine deficiency.

MATERIALS AND METHODS

STUDY AREA

Jos is the capital city of Plateau State.Plateau state has over 30 different ethnic groups. The 2006 Nigerian census put the population of Plateau State at 3,178,712.[6] Jos University Teaching Hospital(JUTH) is one of the three teaching hospitals in the North-Central Zone of Nigeria. It serves as a referral center for the neighbouring states of Bauchi, Gombe, Benue, **Kogi,** Nassarawa, Taraba, Adamawa and parts of Kaduna State.

STUDY POPULATION AND DESIGN

This was a hospital-based Cross-sectional study that was done in the Department of Radiology, Jos University Teaching Hospital (JUTH), and a tertiary health institution situated in the central part of Jos, for the period of twelve months (June 2011-June 2012).

INCLUSION CRITERIA

- Patients that consented to have the procedure (sonographic evaluation of thyroid gland volume and laboratory assessment of thyroid function)
- Patients referred for ultrasound examination, other than thyroid ultrasound scan.
- Patients 18 years and above
- Patients with normal laboratory values of T3(0.6-2ng/ml), T4(45-115ng/ml) and TSH(0.3-6.5ng/ml)

EXCLUSION CRITERIA

- Female during menstruation, pregnancy or who have delivered within the last twelve (12) months
- Subjects with anterior neck swelling or clinical evidence of thyroid/endocrine disorder
- Subjects with previous thyroid surgery.
- Subject with abnormal laboratory values of T3, T4 and TSH.
- Subjects who did not consent to participate in the study

SAMPLE SIZE DETERMINATION

The sample size was determined using Fisher's statistical[7] formula $n=z^2pq/ d^2$ for population greater than 10,000 and it was calculated to be 384 as shown below:

The formula $n=z^2pq/ d^2$

Where n = Desired sample size.

z = Standard deviation, using set at 1.96, which correspond to 95% confidence level.

p = Proportion in target population estimated to have a particular characteristic. If no reasonable estimate, 50% (0.5) is used.

$q = 1.0 – p$

d = degree of accuracy desired, usually set at 0.05

Therefore $n=1.96^2 x0.5x0.5/0.05^2=384$.

However a sample size of 400 was used.

TECHNIQUE

The procedure was explained to all participants, and informed consent was obtained. A data sheet (appendix I&II) was completed for the all participants in which the ages were obtained and weights and heights were obtained by the participants climbing a weighing scale and standing by a wall that was marked in meters The weight and height of each participant was then measured without shoes or heavy clothes before the scan was done. The body mass index (BMI) in Kilogram/meter square (Kg/m^2)[3] was then calculated from the weight and height[2].The participants were asked questions on history of previous thyroid disease or surgery as stated in the questionnaire. Questions on alcohol consumption, cigarette smoking and parity of women were asked as seen in the questionnaires.Patients were examined in supine position with a pillow placed under the shoulders to aid in the extension of the head. All examinations were performed using LOGIC 5, a real-time ultrasound machine fitted with a 10MHZ linear transducer. Ultrasound gel was applied over the anterior neck (thyroid area) and the transducer placed directly on the skin overthe thyroid area. Images of each lobe and the isthmus were obtained in transverse(Fig 4) and longitudinal planes (Fig 5 and 6). Longitudinal (length) as well as transverse (width) and depth (AP) were measured in centimeters (cm).The right and left thyroid volume data were obtained and analyzed separately. The isthmus was not included in the sum.The lobe volume (cm^3)was calculated from the equation of Brunn et al[8,9]using the ellipsoid model formula by multiplying length (L) by width (w) by depth (d) in cm by a correction factor 0.52 and the lobe volumes are summed. The isthmus volume was calculated from $V_{isthmus}$ (cm^3) equals $length_{isthmus}$ by $width_{isthmus}$ by $depth_{isthmus}$ all in cm multiplied by 0.479[31].Total Thyroid volume (cm^3) = total sum of lobe volumes (cm^3)

Isthmus volume (cm^3) = $length_{isthmus}$ x $width_{isthmus}$ x $depth_{isthmus}$ x 0.52

The body surface area was calculated using the formula of Dubois and Dubois[10]

Body surface area BSA (m^2) = $Weight^{0.425}$ x $Height^{0.725}$ x 71.84×10^{-4}

andBody mass index (BMI) ($Kg/m^{2)}$ was calculated from weight/$height^2$.

Blood samples were taken for thyroid function tests (T3, T4 and TSH) in which results that were not within normal range were not included.

RESULTS

Table 1 shows marginal increase in thyroid volume with smoking and alcohol intake, though not significant.

Risk Factors	Male N(%)	Mean Thyroid Vol	P	Female N(%)	Mean Thyroid Vol	P
Non Smoking	132(88.0)	6.05±2.41	0.939	250(100.0)	5.62±2.61	-
Smoking	18(12.0)	6.09±2.06		0(0.0)	-	
Non-Alcohol	115(76.7)	6.05±2.40	0.806	231(92.4)	5.58±2.60	0.378
Alcohol Intake	35(23.3)	6.32±2.28		19(7.6)	6.14±2.74	

Table 2 shows the relationship of the thyroid volume with PARITY

There was no increase in thyroid volume with increase parity.Thyroid volume does not correlate significantly with parity.Even though the thyroid volume is higher in nulliparous(5.99±2.37) than the multiparous(5.73±3.23)

Table 2: Relationship of mean Thyroid Volume with Parity

Parity	Nulliparous(0)		Parous(1-4)		Grand Multiparous(>4)		
	N(%)	MeanSD	N(%)	MeanSD	N(%)	MeanSD	
	227(56.8)	5.99±2.37	125(31.3)	5.42±2.47	48(12.0)	5.73±3.23	0.128

Discussion

There are factors that are known to affect thyroid volume in individuals.Some of the factors were evaluated in this study. They include cigarette smoking, alcohol consumption and parity of the woman.

Cigarette smoking affects thyroid volume. The effect of smoking is more with increased number of sticks smoked per day[3]. There was increase in thyroid volume with smoking. The difference in volume was not statistically significant (P=0.939). Fatima et.al[3] and Aydin et.al[11]noted that thyroid volumes were higher in smokers than non-smokers.It is thought that nicotine acts as a goitrogen.

There was increased thyroid volume with alcohol consumption, though it was not statistically significant with a P values of 0.806 and 0.378 for male and female subjects. Valeix et al[4] also found that thyroid volume increment was noted in both males and females that consumed alcohol.

Parity is known to affect the volume ofthyroid gland as seen in the study done by Mario et.al.[5]The pregnancy is said to act as goitrogen, in which the thyroid will never return to its previous size.There was however significant increase in volume with increase in parity in this study.

In conclusion, increase in thyroid volume was associated with increase in alcohol consumption, parity and cigarette smoking, though they were not significant statistically.

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THE BURDEN OF HEPATITIS C VIRUS INFECTION AND ACCESS TO TREATMENT AMONG RURAL DWELLERS IN A NORTH CENTRAL NIGERIA

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Abstract
Hepatitis C virus infection is a public health disease but the efforts to control it have not fully integrated indigent rural dwellers. This study explores the burden of the disease in Jengre, a rural population in Nigeria. It is a mixed retrospective and qualitative study. Data on 1,339 persons who received HCV testing in Jengre SDA Hospital (over a one year period) was collated and analyzed. All 7 healthcare providers in the hospital were recruited into a focused group discussion on hepatitis C treatment and their experiences in the hospital.
A prevalence of 18.4% was obtained and 11.7% among apparently healthy individuals. The prevalence of hepatitis C in this study is among the highest in the world and there is a total absence of treatment available to those who are infected. This leaves the patients helpless and portends a grave danger to the realization of international hepatitis C elimination goals.

Keywords
Hepatitis, Nigeria, epidemiology, prevalence, HCV

Conflict of Interest
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Introduction

Hepatitis C is one of the most important hepatotrophic viruses that infect humans. It is known to cause chronic liver disease including cirrhosis and hepatocellular carcinoma. The risk of chronic liver disease from hepatitis C virus infection is between 5 and 25%. The ability of this disease to produce such devastating complications, and the fact that it can be transmitted from human to human, makes it imperative for the world to pay more attention wherever it occurs, for the sake of global health.

The prevalence of hepatitis C infection is highest in the low and middle income countries of the world. In Africa, the prevalence is highest in Egypt at 17% while in Nigeria, it is 8%.[1] Most other countries of Africa have prevalence rates of 5% or lower but in the developed world, prevalence rates hardly exceed 3%. The factors that are responsible for the high rates of hepatitis C infection in the developing world include unsafe injection usage, intravenous drug abuse, unprotected sexual intercourse, transfusion of unscreened blood and blood products, tattooing, unsterilized barber practices and poor infection controls.

The problem is compounded in the developing

countries by the high cost of obtaining treatment, lack of access to the medications especially in the sub-urban and rural settings, poor health financing systems and pervasive poverty among the people. It leaves this set of individuals almost at the mercy of the natural course of the illness.

In the past, the major problem with the treatment of hepatitis C had been the absence of reliable medications and the extended period of time needed to take the drugs. These days, with the advent of the direct acting antiviral agents, the treatment has a success rate of over 90% and only about 12 weeks is needed to achieve cure. This has improved health outcomes in the developed world but financing and availability has remained the bane in Africa and the developing world. The situation is likely to be worse in the villages and rural settings of tropical Africa where the access to healthcare generally is poor and national health financing schemes invisible. This gives an idea on the magnitude of the task before the World Health Organization in eliminating hepatitis C infection by 2030 and the direction she needs to go towards achieving this laudable goal.

This research therefore seeks to explore the peculiar situation of the HCV victim in the rural settings of Nigeria. It aims to determine the burden of the disease among these rural dwellers and their access to disease-specific treatment. This will bring to the fore the actual situation among the hardest to reach populations and hopefully direct efforts more purposefully towards eliminating hepatitis C infection.

Materials and Methods

The study was a mixed quantitative/qualitative study where a retrospective study was carried out and then followed by a Focused Group Discussion (FGD) with the healthcare providers of the hospital. It was carried out in Seventh-day Adventist Hospital, Jengre. It is a secondary level facility and is the major hospital serving the village of Jengre and surrounding settlements. Jengre is a village in Plateau State, central Nigeria, which is about 60 km northeast of Jos, the state capital. It is a rural setting located at 10.30^{0}N and 8.78^{0}E with a population of about 6,000. The inhabitants of Jengre are predominantly small scale farmers with little or no education.

Data from a total of 1,339 subjects were included in the study. It involved all patients who had HCV testing in the hospital over a one-year period from April, 2017 to April, 2018. The FGD had 7 participants involving all the clinicians (3 doctors and 4 nurses) who see the patients in the hospital.

At the initial stage of the study, data was accessed from the hospital laboratories on all individuals who had HCV testing. Their medical records were then traced and information on outcome of the testing and primary healthcare providers in the subsequent treatment received relating to HCV were obtained. All these were filled into a pretested proforma.

All doctors and nurses working full time in the hospital at the time, after providing written informed consent, were then engaged in a FGD about their patients with HCV, treatment offered, treatment received and eventual outcomes. The findings were summarized together.

HCV testing in the hospital laboratory utilized Agary® immunochromatographic rapid test kit with reported sensitivity and specificity of 99.4% and 100% respectively. Data obtained were analysed using spread sheets and Epi info 7.1. Approval for the research was obtained from the ethical review board of the hospital. Data pertaining to patient's names, address and hospital numbers were excluded to maintain anonymity.

Results

Data from 1339 subjects were analysed and the socio-demographic distributions are as illustrated in Table 1;

Table 1: Socio-demographic distribution of tested subjects.

Subject Characteristics	
Age	
Less than 18 years	11(0.8%)
Greater than 18 years	1328(99.2%)
Sex	
Male	468(35.0%)
Female	871(65.0%)
Reason for testing	
Ill health	616(54.0%)
Blood donors	723(46.0%)

The prevalence of HCV in the study was 18.4% while among the blood donors (healthy individuals) only, it was 11.7%. None of the subjects was found to have received HCV treatment.

Table 2: Prevalence of HCV

	HCV Prevalence	
	AntiHCV Positive	**AntiHCV Negative**
Cumulative	247 (18.4%)	1092 (81.6%)
Subjects who were ;		
Ill	175 (24.2%)	548 (75.8%)
Healthy (Blood donors)	72 (11.7%)	544(88.3%)
Age		
Less than 18 years	2 (18.2%)	9 (81.8%)
Greater than 18 years	245 (18.4%)	1083 (81.6%)
Sex		
Male	135(15.5%)	736(84.5%)
Female	112(23.9%)	356(76.1%)

Qualitative Assessment

1. Prevalence of HCV in the locality

One of the respondents noted that he encounters more HCV positive patients in Jengre than elsewhere in the course of his practice. It was however a subjective submission as he had not objectively investigated the phenomenon. All others did not observe any significant difference in prevalence of HCV in Jengre compared to other parts of the country where they worked in the past.

2. Knowledge of existence of treatment

All the participants agreed that there was treatment for HCV and identified Jos University Teaching Hospital (JUTH) as the nearest location where patients could have access to both the hepatologist and HCV treatment.

3. Access to Treatment for HCV patients

The respondents were unanimous about a complete absence of treatment in the locality and the inability of the patients to get to JUTH when referred. They cited poverty, out-of-pocket expenditure, poor knowledge and the apparent healthy appearance of

the patients as factors that militated against access to treatment.

4.Experience with treated patients

None of the respondents had ever provided therapy or seen a patient in Jengre who had accessed HCV treatment in the past.

Discussion

The prevalence of HCV in the population studied was 18.4%. This is more than twice the reported prevalence of 8% in Nigeria indicating a more dire situation in Jengre than the rest of the country. This figure is among the highest reported worldwide. This could be linked to the existing risk factors in the population including use of unsterilized sharps, transfusion of unscreened blood, poor healthcare infrastructure and unprotected sexual intercourse which are all likely to be pervasive in this population. One possible factor for the excessively high infection rate in the study participants might be that it is a hospital-based study but analysis of the apparently healthy blood donors from the same community indicate a prevalence of 11.7%. This figure is still much higher than the general Nigerian prevalence indicating a larger burden of the disease in this rural population compared to the rest of the country and continent.

It is unfortunate that the prevalence of HCV infection in Jengre is so high but the more disturbing fact is the near total absence of access to treatment in that locality. Besides the fact that the people will continue to suffer unmitigated HCV-related morbidity and mortality, the disease itself will likely remain a major public health problem as these untreated individuals will remain reservoirs for perpetual worldwide propagation. This threatens global efforts at HCV control.

It is therefore recommended that international efforts to eliminate viral hepatitis as a public health concern should include the often forgotten rural populations of Nigeria and the developing world. Our study have shown that they have a very high burden and yet do not have access to needed therapy. Access to HCV therapy should therefore, be improved as this will go a long way towards actualizing the 2030 sustainable development goal of hepatitis control.

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HOW MUCH DO ANTENATAL CARE ATTENDEES IN A TERTIARY HOSPITAL IN JOS, NORTH CENTRAL NIGERIA KNOW ABOUT GESTATIONAL DIABETES?

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ABSTRACT

Background-The increasing prevalence of GDM has attracted global concern. The associated hyperglycaemia is a source of perinatal morbidity and mortality. Knowledge of GDM is known to prevent complications to mother and baby through adoption of life style modification behaviour and good health seeking behaviour.

Methodology- It was a cross sectional study conducted over a 3 month period. Women were recruited into the study from the antenatal clinic. A structured questionnaire was used to extract information from the respondents. Data was analyzed with EPI INFO 3.5.4 CDC Atlanta, USA.

Results- The response rate was 96.2%. The mean age of the respondents was 29±6 years. Only 2% had no formal education while 46.6% had tertiary education. Most of the women (55.3%) were unemployed and 53.0% of the women were multiparous. The respondents generally have a good knowledge of GDM with an average score of 9±3. The awareness on GDM and its risk factors and awareness on screening and treatment were good. Only 41.5% of the women knew GDM resolves after pregnancy. Knowledge on the other consequences of GDM was good. Health professionals and friends and family served as source of information on GDM in 80.9 and 60.1% of the women respectively.

Conclusion- the knowledge of antenatal women in our centre is good. Continuous training of health workers and women empowerment are strategies that can maintain and improve this knowledge.

Key words: Gestational diabetes, Antenatal care attendees, Knowledge

INTRODUCTION

Diabetes Mellitus (DM) is an increasingly common medical condition in pregnancy[1,2]. Gestational Diabetes Mellitus (GDM) is a global health concern because of its increasing prevalence and potential implications for the health of mothers and their offspring[3]. GDM is defined as any degree of glucose intolerance with first onset or recognition in pregnancy[4].

Diabetes is now a global epidemic, affecting both industrialized and developing countries. The global prevalence of DM has been put at 2.8% and is projected to be about 4.4% by 2030[5]. The prevalence of DM in pregnancy is also increasing globally, and this has been attributed to advanced age at pregnancy, sedentary life style and obesity[2,6]. A prevalence rate of DM in pregnancy of 0.74 and 8.4 per 1000 deliveries have been reported in

Nigeria, of these GDM was the commonest variant[1,7]. Globally, about 1-14% of pregnancies are complicated by GDM[7]. In South East Nigeria the prevalence of GDM is 1.13%[8]. A study in North Central and South Western Nigeria reported a prevalence of 8.5% and 4.9%[9, 10] respectively. In Iran, the incidence was 10.1% among a cohort of women in a tertiary hospital[11].

GDM was found to be common among women above 35 years in a study in Pakistan[12]. It is also common among women from South East Asia, Middle-east and black Carribean[13]. Other risk factors include previous history of GDM, fetal macrosomia, unexplained fetal death and polycystic ovarian syndrome, family history of DM. overweight and heavy glycosuria are also risk factors[13,14,15].

Hyperglycaemia poses a risk to the developing fetus and a potential source of poor perinatal and maternal outcome[2,16]. Risk assessment for GDM is recommended at the first antenatal care visit and glucose tolerance test offered to women at risk[2]. Universal screening with glucose tolerance test is currently advocated. This is because a significant number of women with GDM are missed as a significant number have no risk factors for GDM[14].

A good knowledge of GDM is associated with better glycaemic control and reduced fetal complication[15,16,17]. This ensures adoption of healthy life style, better health care seeking pattern, and better self care[16,18,19]. The literature is replete with information on knowledge/awareness of GDM in women diagnosed with GDM. There is however paucity of information on the knowledge of GDM in the general antenatal population particularly in our centre. This study was therefore structured to access the knowledge of GDM among a cross section of women attending the antenatal care clinic in the Jos University Teaching Hospital, Jos, Nigeria.

METHODOLOGY

The study was a cross sectional descriptive study and conducted from March to May, 2017 at the antenatal clinic of the Jos University Teaching Hospital, Jos. The hospital offers antenatal care services to several pregnant women and serves as a referral centre.

A cross section of women attending antenatal care was recruited into the study irrespective of the parity or gestational age. Women presenting to the clinic for ultrasound and not booked in the hospital were excluded from the study.

A self-administered close-ended questionnaire was used as a source of data collection. The questionnaire and scoring used by Sujindra et al with some additions was adopted for this study. It was pretested among pregnant women presenting for obstetric ultrasound in the ultrasound unit of the antenatal clinic. A trained assistant helped respondents who could not read nor write to fill the questionnaire. The demographic profile added was the modification made on the questionnaire. This consisted age, educational status, occupation, and parity. This was followed by 13 questions on knowledge about GDM and its risk factors, questions about GDM screening and treatment and questions about the consequences of GDM. The source of information on GDM was also assessed. The questions on risk factors assessed the awareness on pre-pregnancy obesity, family history of diabetes, and rapid weight gain during current pregnancy. The options provided were Yes, No or I Don't Know. When the mother answered 'yes' to the questions, it was considered as the right response. Their knowledge on screening test /diagnosis and treatment of GDM was assessed. Questions were asked on the awareness of OGTT, a question was asked if it is important to screen/test for GDM. If she answers yes to any of the above question, it was considered right. Questions were asked to assess the knowledge on treatment options such as diet and exercise, oral antidiabetic drugs, and insulin injection. If the woman responded as diet and exercises or insulin injections/antidiabetic drugs, it was considered as the correct answer. The knowledge of the women on course and consequences of GDM was assessed by questions on whether GDM usually resolvespostpartum, posed a risk to the fetus if untreated, and whether women diagnosed to have GDM were at an increased risk for future Type 2 diabetes. A 'yes' for each of these was considered as a correct response.

Each correct response was given a score of 1 and each woman was scored out of a total of 13. A score of 0-4 was considered as poor knowledge, 5-8 as fair, and 9-13 as good knowledge of GDM. Women who could not read were assisted in responding to the questions on the questionnaire.

Data was analyzed with EPI INFO 3.5.4 CDC Atlanta, USA. Association between knowledge and

age, educational status, and parity of the women was analyzed by test of proportions and the statistical significance was assessed using the Chi-square test. Statistical significance was set at < 0.05.

A formal introduction was made to the respondent. A concise explanation of the objectives of the study was given. An informed consent was obtained. The responded was assured of confidentiality as neither name nor personal identification number was reflected on the questionnaire.

SAMPLE SIZE DETERMINATION

The sample size was derived from the formular[20]:

$$n=\frac{z^2pq}{d^2}$$

Z=1.96 (coefficient of Z statistics for normal distribution table),

p = proportion of antenatal women that had a good cumulative score on awareness (17.5% from study done by Shriraam et al)[18]

q=1-p

d = sampling error tolerated = 0.05.

$$n=\frac{0.175 \times (1- 0.175) \times (1.96)^2}{(0.05)^2}$$

n =328

Another 20% of 328 were added because of those that will not fill the questionnaire properly

Therefore 20% of 328˜ 65

Sample size is therefore = 328+65 = 393

This was approximated to 400.

QUESTIONAIRE

Demographic profile

Age-

Educational status (tick as appropriate)

-primary

-secondary

-tertiary

-Non

Occupation

-House wife

-Employed

Parity (Number of pregnancies beyond 7 months) (tick as appropriate)

-Non

-1

-2 and above

Awareness of gestational diab etes and risk factors

1	Have you heard about diabetes mellitus?	(Yes/No/I don't know)
2	Can diabetes occur for the first time in pregnancy?	(Yes/No/ I don't know)
3	Is family history of diabetes a risk factor for diabetes in pregnancy?	(Yes/No /I don't know)
4	Is pre-pregnancy obesity a risk factor for diabetes in pregnancy?	(Yes/No/I don't know)
5	Is diabetes in previous pregnancy a risk factor for diabetes in pregnancy?	(Yes/No/I don't know)
6	Is rapid weight gain in pregnancy a risk factor for diabetes in pregnancy?	(Yes/No/I don't know)

Awareness about screening and treatment for GDM

7	Have you heard about blood test for diabetes after oral glucose load (Oral Glucose Tolerance Test)?	(Yes/No/I don't know)
8	Is testing for diabetes in pregnancy is necessary?	(Yes/No/I don't know)
9	Can diet and exercises treat GDM?	(Yes/N/I don't know o)
10	Is insulin or oral drugs required to treat GDM?	(Yes/No/I don't know)

Awareness about GDM consequences

11	Does GDM disappear after pregnancy?	(Yes/No/I don't know)
12	Is baby at risk if GDM is not treated?	(Yes/No/I don't know)
13	Mothers with GDM are at risk for overt diabetes	(Yes/No/I don't know)

Source of information on GDM (you can tick more than one option)

14 Mass media
Newspaper/ magazine
Friends and family
Doctors or health professionals

RESULTS

A total of 400 antenatal women were enrolled into the study. The modal age range was 25-33 years and the mean age was 29 ±6 standard deviation. Most of the respondents (46.6%) had tertiary level of education and 2.0% of the respondents had no formal education. Fifty-five point three percent of the respondents were unemployed. Majority of the respondents (53.0%) were multiparous and nulliparous women constituted 23.9% of the respondents. There is a significant relationship (P-value <0.05) between the score on knowledge of GDM with level of education and age. The sociodemographic profile of the respondents is shown in table 1 below.

Table 1 - Sociodemographic profile

Variable	Frequency (N=400)	Percentage	P-Value
Age(Mean-29±6)			0.01
15-24	82	20.5	
25-33	225	56.3	
34-42	80	20.0	
43-48	13	3.2	
Level of education			
None	8	2.0	
Primary	32	8.0	
Secondary	175	43.7	
Tertiary	185	46.3	0.025
Occupation			
Unemployed	179	44.7	
Employed	221	55.3	
Parity			
None	94	23.1	
1	95	23.9	
>2	211	53.0	

The percentage of positive responses for the knowledge of antenatal mothers on GDM and its risk factors, screening and treatment and consequences of GDM are depicted in Tables 2,3 and 4.

Table 2 - Awareness on GDM and risk factors

Respondents who answered yes

Question	Frequency	Percentage
Have you heard about diabetes mellitus?	351	87.8
Can diabetes occur for the first time in pregnancy?	273	68.6
Is family history of diabetes a risk factor for diabetes in pregnancy?	286	71.5
Is prepregnancy obesity a risk factor for diabetes in pregnancy?	269	67.3
Is diabetes in previous pregnancy a risk factor for diabetes in current pregnancy?	292	73.0
Is rapid weight gain a risk factor for diabetes in pregnancy?	254	63.5

Table 3 - Awareness on Screening and Treatment

Respondents that answered yes

Questions	Frequency	Percentage
Have you heard of blood test for Diabetes after glucose load?	212	53.0
Is testing for diabetes in pregnancy necessary?	354	88.5
Can diet and exercise treat GDM?	319	79.8
Insulin or drugs are required to treat GDM?	346	86.5

Table 4 - Awareness on consequences of GDM

Respondents that answered yes

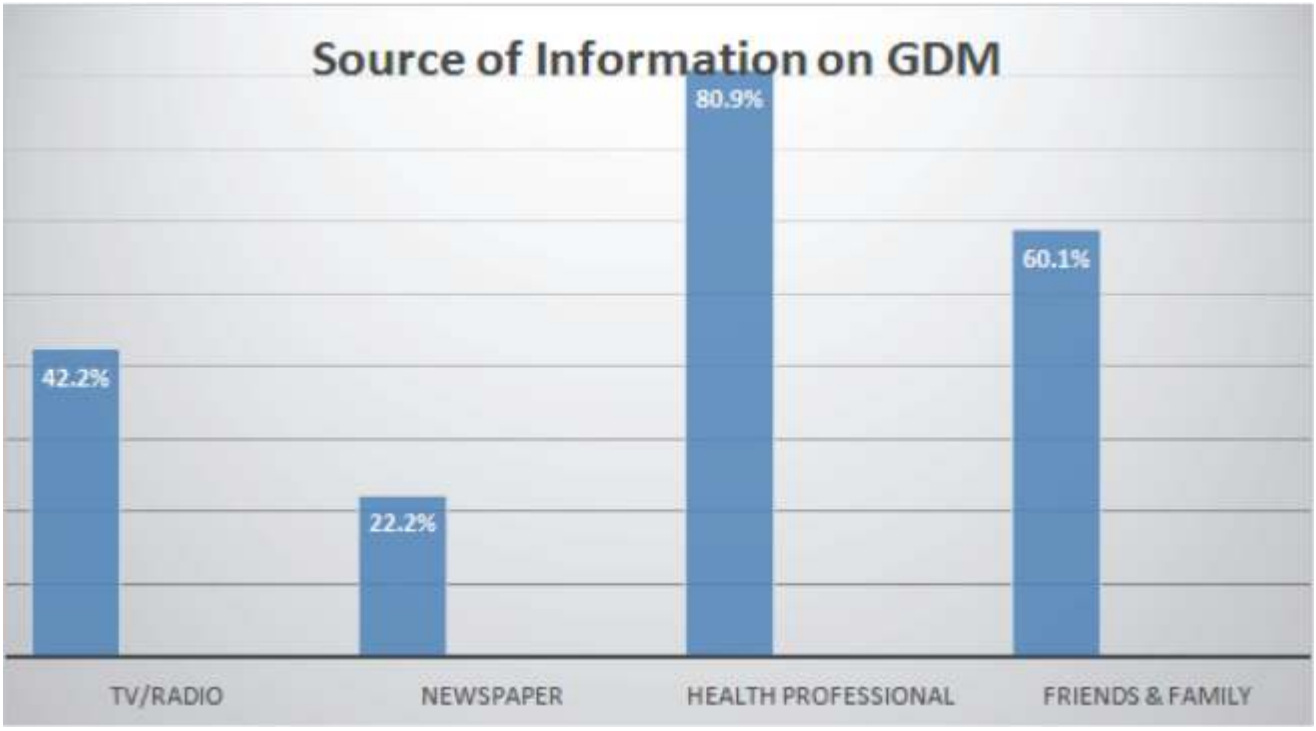
Questions	Yes(Freq)	Percentage
Does GDM disappear after pregnancy?	234	41.5
Is baby at risk if GDM is not treated?	298	74.5
Mothers with GDM are at risk of overt diabetes?	319	79.8

Table 5 below shows the score on knowledge on GDM. A significant number of respondents (50.2%) had a good knowledge on GDM. Ten point six percent of the respondents had a poor knowledge of GDM

Table 5- Score on knowledge of GDM

Score(Mean-9±3)	Frequency	Percentage
Poor(0-4)	19	4.8
Average (5-8)	102	25.5
Good (9-13)	279	69.8

Health professionals and friends and family were the sources of knowledge on GDM in 80.9%% and 60.1% respectively of the women who responded to the questionnaire. Electronic media was the source of information in 42.2% of respondents. These and others are shown in the chart below.



DISCUSSION

One cardinal finding of this study was that most of the respondents had a good knowledge (average score 9±3SD) of GDM. A good knowledge of GDM may likely result in modification of risk factors and better health seeking behavior. This may also help to reduce the rising incidence of GDM and its complications. However a study in southwest Nigeria revealed that only 38% of antenatal women had good knowledge of GDM[21]. A study in Cameroon revealed a poor level of GDM awareness[21]. Also studies in India revealed a poor awareness score on GDM[18,23]. The finding in this study may be attributable to the sociodemographic profile of the respondents. Most of them had formal education. Also, this study found a statistically significant relationship (p-value < 0.005) between awareness on GDM with level of education and age. Women that had formal education and within the reproductive age have more interaction with their work place and also gained awareness because of their experience[24].

A significant proportion of women were aware of GDM and its risk factors. A study among antenatal women in a tertiary hospital in India revealed a similar finding[24]. However Balaji et al. in their study among rural women in India found a poor knowledge on risk factors for GDM[23]. This study further buttresses the influence of exposure and experience on awareness of GDM earlier mentioned.

A good proportion of the respondents are aware of the need to test for GDM and the modalities of treatment. The awareness of Oral Glucose Tolerance Test was average 53.0%. Only 41.5% of the women were aware that GDM disappears after pregnancy. Most of the respondents were aware GDM poses a risk to the baby and that the mother is at risk of overt DM in the future. A good knowledge of risk factors and consequence of GDM is necessary for a woman to take proper precautions and for self-care. It has also been stated that knowledge of GDM ensures proper utilization of antenatal care services and adopting life style modifications in a high risk population[18]. This is particularly important as the rate of progression from GDM to DM is increasing[23].

In a study by Sujindra et al. the main source of information on GDM for women attending antenatal care was from Doctors and other paramedical staff [18]. This is similar to the finding in this study were health professionals accounted for a cumulative 80.9% of source of information. Friends and family was a source of information on GDM in 60.1% of the respondents. This is particularly impressive. A greater role of health care workers in creating awareness on GDM has

been reemphasized[18]. The above finding further buttresses the need to include awareness of GDM and other medical conditions in pregnancy in health education programs. This will promote adoption of healthy lifestyle, better healthcare-seeking pattern, better self-care, and thus prevention and early diagnosis of the disease, thereby reducing the prevalence of GDM, improving pregnancy and neonatal outcomes and also the economy of the country[18].

In conclusion, the antenatal women had a generally good knowledge of GDM. There is a significant relationship between the knowledge of GDM with the age and educational status of the respondents. Health workers constituted the major source of information for the respondents on GDM.

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AURAL FOREIGN BODIES ENCOUNTERED IN A TERTIARY HEALTH FACILITY BINGHAM UNIVERSITY TEACHING HOSPITAL JOS

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ABSTRACT

Introduction-Aural FB is anything but wax lodged in the ear; it could be organic or inorganic, animate or inanimate. Common Fbs are grains/seeds, cotton buds, beads, etc. commonly introduced by children due to curiosity and adventurous exploration of body orifices. Removal by trained personnel and specialists is safe with minimal or no complications but attempts or removal by unqualified personnel can present severe complications.

Method- A three year retrospective study to evaluate aural FB encountered in a tertiary institution; data of 234 patients with aural FBs were collected and analyzed.

Results-234 patients were evaluated, 136 males and 96 females-thus having a M:F= 1.4:1. Most of the FB occurred in the age range of 0-10 years with grains/seeds as the commonest FB. Cotton buds were seen mostly in adults. Most of them were removed in clinic settings without complications.

Conclusion- Removal of aural FBs by untrained or nonprofessionals can present with severe complications thus attempts at removal should be avoided; referral to the trained professionals is advised for a save outcome.

Introduction.

Foreign body in the ear canal is anything but wax found lodged in the ear canal. It could be Organic or inorganic; animate or inanimate; hygroscopic or non-hygroscopic etc. The common foreign bodies usually encountered include the following:-Beads, seeds/grains, cotton buds (Q-tips), stones, pieces of paper, pencil tips, rubber, eraser, metallic parts, chicken feather parts, cockroaches, flies, maggots (from eggs of flies on mucopurulent discharge which then hatch into maggots- ie from CSOM, otitis externa maligna).Foreign Bodies in the ear are known to be commonly found in the paediatric age group due to their curiosity in exploring orifices within their bodies[1,2,4,5,6,8,10,11,12]. Children usually insert FBs in their ears by themselves or by pair groups during plays. Foreign Bodies like cotton buds (Q-tips) are usually inserted by adults intentionally due to itching ears, dirty ears or to mop water trapped in the ear after a bath or as a habit. Live insects like cockroaches are usually found in the aural cavity of patients from low socioeconomic areas with poor sanitary conditions[1]. Aural Foreign Bodies can equally be found in the aural cavity of mentally ill patients. Other live insects like ticks and bugs have been found stocked in the skin of the aural cavity of some patients in other literatures[8].

In literature of recent, an uncommon foreign body the Bluetooth device that is being used for cheating in high school examination has been described[9]. This is likely to go viral with this technological age; however it has not been encountered in our environment.

Presentation depends on the nature of the foreign body, the size, shape; and whether or not there has been attempt(s) at removal and by whom. Attempt(s) at removal by non specialists at home or in the hospital changes the presentation to the specialist. Presentation usually can be with pains, decreased hearing, bleeding, discharge, inflammation etc.

Children mostly under the age of 10 yearsinsert objects or materials that are close to them like grains/seeds, beads, pencil tips/erasers either intentionally or by pair groups due to curiosity or

just to explore their orifices during plays[1, 2, 4,5,6,8,11,12]. Adults on the other hand insert things in their ears intentionally to alleviate some concerns e.g. itching ears, thus things like cotton buds are usually seen. In general, more males insert things in their aural cavity than females thus giving a male: female ratio range of 1.5-2.1:1 in most literature reviewed[1, 2, 3, 4, 5, 6, 7, 8 10, 11, 12, 13] and as in this study.

The treatment for aural foreign bodies is removal which has been handled quite wrongly in most occasions due to it being attempted by untrained personnel or non-specialists and delayed referral to the specialist thus resulting in to unwarranted complications. Some institutions have a well structured arrangement in terms of patients' management making sure patients are referred as at when due to the appropriate departments for correct management thus reducing untoward complications to the barest minimum. Most of the aural foreign bodies are removed under direct vision in the clinic setting without anaesthesia with instruments like Jobson Horne's probe, alligatorforceps, aural dressing forceps or syringing; only a few are done under general anaesthesia in very young children and uncooperative patients to avoid complications[1,2, 3, 6, 9, 12,14],. Live foreign bodies are however suffocated or killed with solutions like olive oil,lignocaine spray before suctioning out or removal as above[8]. Grains/seeds, beads, cotton buds, pieces of paper form the bulk of aural foreign bodies seen in this institution. Complications observed include abrasion, laceration, bleeding from the EAC, otitis externa and TM perforation in rare occasions with damage to the ossicles.

Method.

This was a three year retrospective study (January 2015-December 2017)in Bingham University Teaching Hospital Jos Nigeria. The aim was to evaluate the types of aural foreign bodies seen in the institution within the period and how they were handled. Only patients seen in the ENT unit and managed by the unit trained ENT Nurses/Otorhinolaryngologist were included in the study. Records of two hundred and thirty four patients in the ENT unit of the department of surgery of BHUTH with aural foreign bodies were evaluated and reported as below.

RESULTS.

Table 1

Age and Sex Distribution.

Age(yrs)	Male	Female	Total %
0-10	42	28	70(29.9%)
11-20	26	18	44(18.8%)
21-30	20	14	34(14.5%)
31-40	20	18	38(16.3%)
41-50	18	12	30(12.8%)
50>	12	6	18(7.7%)
TOTAL	138	96	234(100%)

Male: Female Ratio=1.4: 1.

Table 2

Mode of Presentatation.

Presentation	%
Pains	76(32.5%)
Discount	52(22.2%)
Decreased Hearing	42(18.0%)
Bleeding	30(12.8%)
Discharge	14(6.0%)
Itching	20(8.5%)
TOTAL	234(100%)

Table 3
Types of FB Removed.

Types of FB	No	%
Grains/Seeds	84	35.9%
Beads	70	29.9%
Cotton buds	60	25.6%
Insects	09	3.8%
Pieces of paper	06	2.6%
Others(Eraser,Stone,Chicken Feathers,etc)	05	2.2%
TOTAL	234	100%

Table 4
Complications Observed.

Complication	No	%
No Complications	191	81.6%
Abrasion	22	9.4%
Laceration/Bleeding	10	4.3%
Otitis externa	8	3.4%
Tm perforation/Otitis media	3	1.3%
TOTAL	234	100%

The results involve a total of two hundred and thirty four patients' records analyzed. Table 1 shows the age and sex distribution with the highest number of foreign bodies 70 (29.9%) occurring at the age range of 0-10 , followed by 44 (18.8%)age range 11-20,and the others as indicated in table 1.There are more males (138) than females (96) giving a Male : Female ratio of 1.4:1.Table 2 shows the mode of presentation by patients with pains as the most common 76 (32.5%) and discharge as the least 14 (6.0%), others are as shown on the table. Table 3 shows the types of foreign bodies removed from the patients with grains/seeds 84 (35.9%) being the commonest, followed by beads 70 (29.9%), then cotton buds 60 (25.6%) and the least being others with chicken feathers common used intentionally for itchy ears. Table 4 gives the complications observed after removing the foreign bodies from the ears. There are no complications 191 (81.6%) in most of the patients handled in the ENT unit due to the prompt presentation and the trained personnel that handle the procedure. The complications recorded are as in table 4 with the least being TM perforation/Otitis media which were as a result of poor management before referral to the ENT unit of the institution. Generally, patients managed in the unit have minimal complications recorded as a result of its trained personnel.

Discussion.

Aural Foreign bodies are usually encountered in the paediatric age group worldwide; this is the case in this study as most of the patients are 10 years and below 70 (29.9%) due to their curiosity and exploratory behavior at this age as found in other studies worldwide[1, 2, 3, 4, 5, 8, 9, 11, 12]. The study also showed a male preponderance with a total of males at 138 to the female at 96, thus giving a male: female ratio of 1.4:1, this is within the range seen in literature[1, 2, 4, 7, 9, 11]. This could be due to the fact that the males are naturally more curious than their female counter part. Patients usually present in clinic as a result of pains in the peadiatric age group with cries and pulling the ear, while the elderly patients may complain of discomfort in the ear. Others may complain of reduced hearing if the foreign body occludes the whole canal. There could be bleeding if there has been attempt at removal or if the foreign body is irregular and rough; there could be discharge or itching if the foreign body has

stayed for awhile in the canal or has caused injury to the drum with a perforation and otitis media. In table 3, Common things are commonly inserted in the ear by children, thus in our environment, grains/seeds are mostly found in the EAC 84 (35.9%) followed by beads 70 (29.9%), cotton buds 60 (25.6%) usually by adults intentionally as a result of itchy ears. Others like the chicken feather are in common use in our environment by adults for itchy ears as well. Table 4 gives the observed complications with majority of patients 191 (81.6%) having none either as a resultof prompt presentation or the appropriate personnel that handled the procedure, this is similar to other results in literature and the least and most serious complication of TM perforation/ Otitis media usually results from attempted removal before presentation to the expert.

Conclusion.

Aural Foreign Bodies commonly occur in the peadiatric age group due to curiosity and the tendency at exploring natural body orifices; it also occurs in adults when used intentionally for cleaning, scratching or mopping the ear. Removal however can present complications if not handled properly and correctly by trained personnel and professionals. A new form of foreign body was noted in literature (Bluetooth device), it should be monitored as complications from it could be severe. Adequate monitoring of the young children, avoidance of repeated attempts at removal of the aural foreign body and prompt referral to the qualified specialist for removal will reduce complications.

Competing interest: None.

Authors' contributions: NLT collected the data, analyzed the data, carried out literature search, prepared the manuscript and head of the management team; while AM and D were part of the management team and also collected the data.

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