



Knowledge and attitude of healthcare providers towards prenatal screening and diagnosis in a lower-middle income country

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Abstract

Background: Prenatal screening and diagnosis ensures antenatal care is targeted at the foetus specific need(s).

Objective: This study assessed healthcare providers' knowledge and attitude towards prenatal screening and diagnosis at the University College Hospital, Ibadan, Nigeria.

Methods: A cross-sectional survey of 350 healthcare providers (HCPs) in a tertiary hospital was carried out. Data was collected using a semi-structured self-administered questionnaire and analyzed using SPSS version 23.0. Descriptive statistics such as mean and standard deviation were used to summarize the quantitative variables.

Results: The mean age of the HCPs was 31.5±1.6 years. Nearly all (99.1%) were aware of prenatal screening and diagnosis while medical education (58.6%) was the main source of information. About two third (68.0%) had the knowledge of at least one method of prenatal diagnosis while a little over one-third (39.7%) were aware of the complication of the procedures. Ultrasound was the main method identified. All the HCPs strongly agreed that prenatal screening and diagnosis should be offered to all pregnant women, and 91.4% of them indicated their willingness to undergo it.

Conclusion: There is good knowledge, high level of awareness and positive attitude towards prenatal screening and diagnosis among the HCPs, in the University College Hospital Ibadan. However, there was a poor awareness of the complications of the procedure. This indicates the need for training and re-training of HCPs about prenatal screening and diagnosis counselling and procedure. Investment in equipment and information dissemination cannot be overemphasized in a lower-middle income country like Nigeria.

Keywords

Prenatal, screening, diagnosis, congenital anomalies, providers, knowledge

Introduction

Congenital malformations (CM) are defects of embryogenesis either of organs or body regions identifiable during the intrauterine life or after birth. The causative factors is often difficult to identify but have varied history and may be as a result of genetics, infectious, nutritional or environmental factors^{1,2}. Some CM poses major challenges and contributes to long-term disability with overall effect on individuals, families, health care systems and societies².

These CM account for 20-25% of perinatal deaths and an additional 170,000 under 5 years children's deaths worldwide². Nine of ten children born with a serious CM are in low- and middle-income countries².

Prenatal diagnosis which could be invasive or noninvasive includes every diagnostic modality aimed at gaining information about the embryo or fetal wellbeing³. The invasive methods include maternal serum alpha-fetoprotein, unconjugated estriol, serum beta-Human chorionic gonadotropin, serum inhibin, embryoscopy, fetoscopy, amniocentesis, Chorionic Villus Sampling, Percutaneous Umbilical Blood Sampling, percutaneous fetal skin biopsy and Pre-implantation biopsy of blastocysts^{4,5}. The non-invasive techniques are ultrasound scan, fetal echocardiography, and Magnetic Resonance Imaging⁶. Often times, some of these tests are administered in early pregnancy to determine if the foetus will be recommended to be





aborted in high-risk pregnancies with likelihood of a foetus with CM not compatible with life^{7,8}.

Most prenatal diagnosis procedures are not commonly performed in Nigeria and available data are mostly from advanced nations of the world⁸. The incidence of 0.5% CM detected by ultrasound was reported over three decades ago⁹. However with the advent of newer diagnostic methods, recent studies have reported the incidences of 0.5-9.9%¹⁰⁻¹³. Despite newer methods, studies have shown dearth of information about the screening, diagnosis, prevalence, and spectrum of CM in Nigeria^{14,15}. Therefore, this study is aimed at exploring healthcare providers knowledge and attitude towards prenatal screening and diagnosis of anomalies in the unborn child at the University College Hospital, Ibadan.

Methods

This was a cross-sectional survey which assessed 350 healthcare providers' knowledge and attitude towards prenatal screening and diagnosis at the University College Hospital, (UCH) Ibadan, Nigeria. UCH is a tertiary health institution in the southwestern region of Nigeria and serves as a referral centre for the neighboring private, primary and secondary health facilities. All consenting healthcare providers in the department of Obstetrics and Gynaecology and Paediatrics that offer primary care during pregnancy and provide treatment for children with CM during the study period selected by simple random sampling were included in the study. These included consultants, resident doctors, house officers, and midwives/nurses.

The sample minimum size was calculated using the formula $n = \frac{Z\alpha^2(pq)}{d^2}$. Where p is 98.4% (proportion of health providers with knowledge of prenatal diagnosis)³ and d is 1.5% while taking into consideration the total population of eligible and available healthcare providers in each department.

Information on their demographic and professional characteristics, awareness, knowledge and attitude towards prenatal screening and diagnosis was obtained using a semi-structured self-administered questionnaire. The questionnaire was developed by the investigators after review of literatures and pre-tested among 10

HCPs to assess for clarity and understanding of the questions and validation prior to its administration. Information on their socio-demographics and professional characteristics, awareness, knowledge and attitude towards prenatal screening and diagnosis of congenital malformations were obtained.

In this study, awareness of prenatal screening and diagnosis was defined as "healthcare provider being aware or having heard of prenatal screening and diagnosis" while knowledge was assessed by identification of any available method, and complications of prenatal screening and diagnosis. Attitude was assessed on the five-point Likert scale and acceptance to offer prenatal screening and diagnosis or/and termination of pregnancy if CM was confirmed. Data was entered and analyzed using SPSS version 23.0. Descriptive statistics such as mean and standard deviation were used to summarize the quantitative variables.

Results

Of the 350 HCPs, 163 (46.6%) were doctors and 187 (53.4%) were nurses. The mean age of the respondents was 31.5 ± 1.6 with a range of 20 to 52 years. The providers were mainly females (54.0%) and married (67.4%) with 7.1 ± 0.84 mean years of clinical experience (Table 1).

Table 1. Healthcare providers' demographic and professional characteristics (N=350)

Variables	Frequency	Percent.
Age – range, mean \pm SD	20-52; 31.5 ± 1.6	
Sex		
Male	161	46.0
Female	189	54.0
Marital status		
Single	114	32.6
Married	236	67.4
Cadre		
Doctors	163	46.6
Nurses	187	53.4
Years of experience – mean \pm SD	7.1 ± 0.84	

Almost all (99.1%) of the HCPs were aware of prenatal screening and diagnosis of CM and medical education (58.6%) was the main source of information. Despite the high level of awareness, just over one-third (39.7%) were aware of the complications. However, majority (82.9%) agreed to the need for training and re-training in prenatal screening and diagnosis (Table 2).

Table 2. Knowledge and Awareness of Prenatal Screening and Diagnosis (N=350)

Variable	Freq.	Percent
Aware of prenatal screening and diagnosis		
Yes	347	99.1
No	3	0.9
Source of information		
Medical education	205	58.6
Print or television media	33	9.4
Internet	35	10.0
Colleagues	57	16.3
Others	17	4.9
Are you aware of complications of prenatal screening and diagnosis?		
Yes	139	39.7
No	211	60.3
Ever attended training or update on prenatal screening or diagnosis?		
Yes	42	12.0
No	308	88.0
Is there need for training and re-training in prenatal screening and diagnosis?		
Yes	290	82.9
No	60	17.1
Do you have knowledge of the methods available in your centre?		
Yes	238	68.0
No	112	32.0

Of the identified methods of prenatal screening and diagnosis Ultrasound was the commonest (66.9% and 81.3% by doctors and nurses respectively) (Fig. 1).

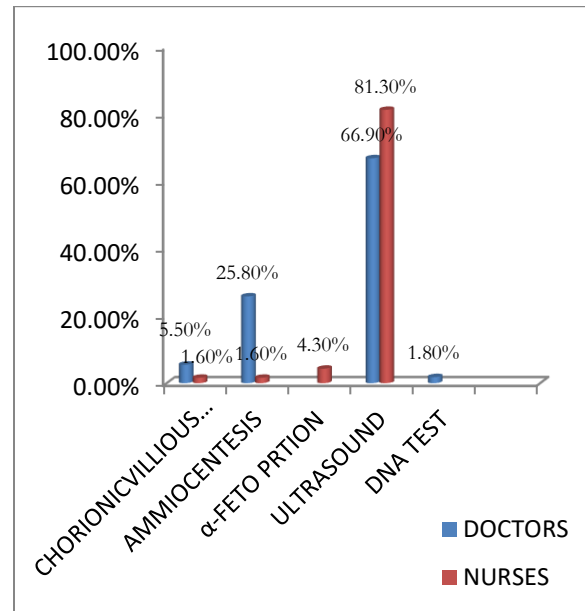


Figure 1. Prenatal screening and diagnostic methods known to the healthcare providers based on their cadre.

About two-third (60.3%) of the HCPs strongly agreed that prenatal screening and diagnosis should be offered to women at risk of CM and 43.7% strongly agreed that it should be offered to all women. Over one-third (37.4%) disagreed that prenatal screening and diagnosis does not significantly affect couples and 58.0% strongly disagreed that prenatal screening be performed without patients consent. About one-third (32.6%) of the HCPs disagreed and were of the opinion that prenatal screening should be offered only to patients that consented to termination in the event of a confirmed CM. This proportion was closely followed by 32.0% who strongly disagreed.

The view that pre and post prenatal screening counseling can be offered if the patient is considered to have minimal risk was agreed to by 44.0% of the HCPs. The idea that results can be communicated at the next clinic visit if positive to patient alone if spouse is unavailable was supported by (39.4%) of the HCPs. Prenatal screening and diagnosis are means to illegally increase abortion rates was disagreed and strongly disagreed by 39.7% and 35.7% respectively. In contrast, prenatal screening and diagnosis regarded as unnecessary because of the fetal right to life was strongly supported by 1.7%, while half of the HCPs disagreed. The acceptance of prenatal screening if pregnant was supported by almost all (91.4%) while about two-third (65.4%) of them would accept an offer for termination of pregnancy if results

were positive for an anomaly in them or their spouse (Table 3).

Table 3. Assessment of respondents' Attitude towards Prenatal Screening and Diagnosis of Congenital Malformations

Variables	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
Should be offered to all pregnant women	63 (18.0)	24 (6.9)	12 (3.4)	98 (28.0)	153 (43.7)
Do not significantly affect couples	90 (25.7)	131 (37.4)	27 (7.7)	46 (13.1)	56 (16.0)
Should be offered to all pregnant women at risk of congenital anomalies	22 (6.3)	6 (1.7)	9 (2.6)	102 (29.1)	211 (60.3)
Should be mandatory in high risk patients	16 (4.6)	40 (11.4)	23 (6.5)	106 (30.3)	165 (47.1)
Can be performed without patient's consent.	203 (58.0)	110 (31.4)	10 (2.9)	6 (1.7)	21 (6.0)
Should be offered only to patients that consent to termination in the event of a positive test.	112 (32.0)	114 (32.6)	45 (12.9)	41 (11.7)	38 (10.9)
Pre and post counseling can be offered if patient is considered to have minimal risk	15 (4.3)	45 (12.9)	28 (8.0)	154 (44.0)	108 (30.9)
Results can be communicated at next clinic visit if positive to patient only and not wait until spouse is available	28 (8.0)	41 (11.7)	39 (11.1)	138 (39.4)	104 (29.7)
Communication of positive result should be delegated to senior colleagues irrespective of training	21 (6.0)	84 (24.0)	55 (15.7)	121 (34.6)	69 (19.7)
Prenatal screening and diagnosis are means to illegally increase abortion rates	125 (35.7)	139 (39.7)	13 (3.7)	34 (9.7)	39 (11.1)
Prenatal screening and diagnosis are unnecessary because of the fetus's right to life.	137 (39.1)	177 (50.6)	12 (3.4)	18 (5.1)	6 (1.7)
	Yes	No	Not sure		
Acceptance to offer prenatal screening and diagnosis to friend, colleague and relative	317 (90.6)	9 (2.6)	24 (6.8)		
Acceptance of prenatal screening for you or your spouse if pregnant?	320 (91.4)	9 (2.6)	21 (6.0)		
Acceptance to termination of pregnancy if results are positive for anomaly	229 (65.4)	75 (21.4)	46 (13.1)		

Discussion

This study revealed a good knowledge, high level of awareness and positive attitude towards prenatal screening and diagnosis among the HCPs, in the University College Hospital Ibadan. However, there was a poor awareness of the complications of the procedure. The high level of awareness was similar to the report of studies by Ajah et al., and Jakobsen et al., among Norwegian physicians and reproductive HCPs in Abakaliki, Nigeria respectively^{3,16}. The finding was not surprising because the study was among HCPs coupled with the fact that their main source of information was from medical education.

Although, other methods of prenatal screening and diagnosis such as amniocentesis, chronic villous sampling, alpha fetoprotein and DNA test were known by the prenatal providers, the most known method was ultrasonography across all cadres of staff. Likewise, ultrasonography was also reported as the most known method in Abakaliki, Nigeria³. This could be because ultrasonography is the main method of prenatal screening available in the study centre. Also, ultrasound has been shown to have numerous benefits ranging from medical, cost friendly with limited or no complications.¹⁰ The HCPs studied were of the notion that there was a need for training and re-training as regards prenatal screening and diagnosis. This fact should be emphasized because the ease of detection of fetal anomalies is dependent on the expertise of the examiner and one can

never be an expert at what he lacks knowledge of^{17,18}. Likewise, their knowledge and skills would contribute significantly to the quality of prenatal counseling services offered^{18,19}. Early screening will result in early prenatal diagnosis of CM and this will afford the opportunity to influence perinatal management favorably by either altering the mode of delivery to prevent complications, early delivery to avert continuing fetal organ damage or treatment in utero to prevent, reverse, or minimize fetal organ injury as a result of a structural defect as well as termination of pregnancy when necessary^{10,20}.

Surprisingly, a preponderance of the HCPs did not know the complications of prenatal screening and diagnosis. The fact that majority had never attended any training or update about prenatal screening and diagnosis supports the need for training and re-training especially among those that offer obstetrics care. The above finding corresponds with a similar study conducted in Israel²¹.

The HCPs strongly agreed that prenatal screening and diagnosis should be offered to all pregnant women especially those at risk of CM. This corroborates with the findings of Anat et al, a similar study among healthcare workers²¹. Prenatal screening and diagnosis can result in a lower perinatal mortality rate and lower healthcare cost if the long-term care that children with severe and major CM require for survival are prevented when pregnancy is terminated early¹⁰.

Communicating positive results to the patient alone if spouse is unavailable at the next clinic visit was supported by over one-third of the HCPs. Usually, in



our environment women lack decision-making autonomy regarding their healthcare due to financial dependence, socio-cultural norms and behavioural perspectives with men holding the main power to make decision^{22,23}. However, it is important to avail the women and their spouses when available the opportunity to make informed decision if there would be a need for termination of pregnancy, immediate or delayed intervention and/or plan for future care. The HCPs supported that pregnancy be terminated if the result of prenatal screening and diagnosis of CM was positive and not compatible with life. They also agreed and that such action will not increase illegal abortion. The Nigerian constitution upholds the restrictive abortion law bans except in the presence of fetal CM that will result in severe impairment, monstrous birth or not compatible with extra-uterine life²⁴. In addition, this will result in a decrease in the prevalence of children born with CM in the country.

The HCPs' positive attitude towards prenatal screening and diagnosis was demonstrated in that nearly all of them agreed to offer prenatal screening to their friends, colleagues, and relatives. Likewise, they intended to accept prenatal screening if they or their spouse was pregnant with most of them agreeing to termination of the pregnancy if the screening and diagnostic results were positive for CM. Some previous studies similarly reported this too^{21,25}. HCPs should be trained on how to give supportive care and genetic counselling to couples who desire to keep affected pregnancies.

Our study has its own limitations. No variable in the questionnaire assessed if the healthcare providers could offer prenatal screening counselling or procedure among those that were knowledgeable. Also, this was a tertiary hospital-based study thus its findings may not be a true reflection when compared with the responses of similar health providers in the secondary and primary healthcare institutions. Therefore, future studies should consider health providers from other tiers.

Conclusion

There is high awareness and good knowledge about various methods but poor awareness of the procedural complications associated with prenatal screening and diagnosis of CM among HCPs. Extra attention needs to be paid to training and re-training so as to bridge the gap in knowledge. Emphasis should be placed on public enlightenment through the provision of information, education and communication (IEC) materials and not just through medical education to health workers as demonstrated by this study. It is also imperative that governments in lower-middle income countries begin a

drive to expand the frontiers of prenatal fetal screening and diagnosis through the provision of equipment and appropriate legislation.

Authors' contribution

All authors were involved in the conceptualization, planning, data collection, interpretation of the result, manuscript preparation, proofreading, and approval of the final manuscript.

Conflict of Interest

There was no conflict of interest.

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