Original Article

Reasons Pregnant Women seek Prenatal Sonographic Gender Disclosure in Makurdi, Nigeria

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ABSTRACT

Fetal gender disclosure, a non-medical prenatal ultrasonography indication, although largely ethically unjustifiable, continues to grow and thrive in demand due to its request by pregnant women. The study aims at establishing the proportion of women who want to know fetal gender during prenatal ultrasound. This was twelve months' prospective study of all pregnant women, 16weeks and above who presented at our facility for antenatal ultrasound in Makurdi from 7th may 2019 to 6th may 2020. Structured questionnaire was used to obtain information on factors influencing their willingness to know the gender of their unborn children. The information collated was entered into statistical package for social science (SPSS) version 23.0 for analysis. P-values=0.005 was considered significant for the study population. Two hundred and fifty (250) pregnant women were recruited for the study. Majority of the women 233(93.2%) showed marked interest in knowing the gender of the fetus, while 17(6.8%) did not. The main reason for wanting to know the sex of the fetus was for easier choice of clothing and naming; whereas the main reason for not wanting sex disclosure was because any child is good. There was no statistically significant correlation between gender preferences and the other variables such as age, educational attainment, tribe and previous miscarriages (P=0.136, 0.485, 0.275 and 0.942 respectively). Majority of the women 233(93.2%) want fetal gender disclosure due to ease of choice of clothing and naming. The deliberate policy of non-disclosure on account of non-medical indication during prenatal ultrasonography, is untenable in our environment.

Keywords: Gender disclosure, Pregnant, Women, Prenatal ultrasonography

INTRODUCTION

Pregnant women have always been inquisitive about the gender of their unborn children, following the introduction of prenatal ultrasonography in medicine. The far-reaching changes initiated by ultrasound in the depiction of real-time, high-resolution images, without risks of radiation to the fetus, has led to the ingenuity to assign gender to these children, thereby relieving the apprehension of the pregnant

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women. However, this has been largely achieved at an opportunity-cost, with consequent emergent moral, medico-legal, ethical, and psycho-social problems,¹ thus prompting several international organizations such as the International Federation of Gynecology and Obstetrics (FIGO), American College of Obstetricians and Gynecologists (ACOG) as well as the American Society of Reproductive Medicine (ASRM), to view the request by these women for gender disclosure during prenatal ultrasonography as not only ethically unjustifiable but purely based on the non-medical use of ultrasound.²⁻⁴

But, strictly speaking, it is difficult to defend non-disclosure since no scientific evidence of any serious harm to the human fetus has been reported in the over forty years of substantial use of prenatal medically indicated and superintended diagnostic ultrasound.⁴ Apart from this, some authors are of the view that prenatal gender disclosure is part of the obligatory autonomy-based right of pregnant women and should even be offered routinely, except of course in communities where gender ratio imbalances have grave socio-cultural repercussions that autonomy can lawfully be restricted.⁵

Again, it seems reasonable to imagine that those who object to fetal gender determination and disclosure do so out of genuine concerns about the scan time being unnecessarily extended during prenatal gender ultrasound, the chances of fetal gender misdiagnosis during scanning prior to disclosure, and the possibility of misuse of the disclosed gender details, especially when the fetus is not the desired gender, thereby making these women to lose interest in the unborn child by contemplating termination of the pregnancy. However, during a complete prenatal obstetric ultrasound scan, there is no proof that fetal gender determination prolongs the examination time. The chances of prenatal gender misdiagnosis during scanning prior to disclosure is small, less than 3%, and should be explained to prospective parents before scanning and during disclosure. A negligible number of

pregnant women may contemplate termination of pregnancy when the fetus is the unwanted gender; but this is best left in the hands of the attending physicians for counselling, without recourse to unnecessary gender-selective abortion.⁶

High resolution real-time ultrasonography has drastically revolutionize the scope of prenatal imaging, with fetal gender determination becoming possible, most reliably from about the 16 weeks' gestation onwards, although studies have shown that this can, infact be achievable much earlier between 12 and 16 weeks with varying favorable results.^{7,8} The accuracy of fetal gender determination generally increases with gestational age from 97.1% in the second trimester to 98.5% in the third trimester, with an overall prenatal fetal gender accuracy rate much higher for male than the female fetus due largely to the more satisfactory images of the external genitalia of the former.⁹ Research findings has also revealed that fetal sex determination is indeed possible at late first trimester with a reported accuracy increasing with gestation from 70.3% at 11 weeks, to 98.7% at 12 weeks and 100% at 13 weeks.¹⁰

Prenatal fetal ultrasound is routinely indicated in pregnancy for medical reasons, however, fetal ultrasound without a medical indication to confirm the gender of a fetus is at the moment being canvassed by some families, without thinking of the detrimental effects this can have on the bonding between the mother and the fetus. The familiar medical indications include, assignment of zygosity in twin pregnancy, fetuses at risk of an x-linked disorder such as hemophilia for which identification of female genitalia virtually excludes the disease, to confirm fetal gender to diagnose certain structural abnormalities (posterior urethral valve which is seen exclusively in male fetuses, turner's syndrome fetus demonstrate female genitalia),aneuploidy or mosaicism involving fetal sex chromosomes, and suspicion of an intersex state in the presence of sex discordance between ultrasound and amniocentesis data¹¹⁻¹³. The non-medical reasons given by women for sonographic sex determination are

varied, and includes spouse/relatives' request, a need to see the baby, and fetal sex determination^{13,14}. Various studies have shown that gender preference, for these women is generally influenced by socio-demographic, religious, cultural, emotional, personal and conjugal desires.¹⁵⁻¹⁹

Ultimately, fetal gender disclosure to a pregnant woman may create emotional attachment between the mother and the unborn child.²⁰ To this end, various psychological studies have indicated a strong relationship between an increased risk of postnatal maternal depression and a strong sex preference that has not been fulfilled. Thus, when the baby is not of the desired gender, prenatal disclosure could be life-saving in allowing for a period of adjustment before being faced with the physical and psychological realities of the actual unwanted baby.²¹

Male children are generally preferred over females, according to global literature reports.²²⁻²⁴ Gender discrimination is therefore, rampant due to preference for male children who are expected to add to the family wealth/prosperity due to their higher wage-earning capabilities, propagate the family name, cope with potential disasters, care for aged parents and support the family, provide general social security of the family, among other reasons. Girls on the other hand, have to be protected and considered economic liability due to the provision of large sums of money for their dowry and weddings, additionally once married they automatically become part of the husband's family with no direct responsibility to their parents either in illness or old age. This has led to the outlaw of gender-selective abortion, restriction of access to prenatal ultrasonography for the sole purpose of gender disclosure and a ban on other gender identification technology in some countries where gender-selective deaths, female feticide and infanticide, are practiced.²⁵⁻²⁷

In Nigeria, where there are no such laws restricting prenatal gender disclosure, varying reasons are given why pregnant women want to know the gender of their unborn child.²⁸⁻³⁰

To the best of our knowledge, no documented research on why pregnant women request for prenatal sonographic gender disclosure has been carried out in our center. Similar studies, however, have been undertaken elsewhere in Nigeria,²⁸⁻³⁰ with substantial research work from the south-eastern region, where there is additionally documented evidence that the male child is the preferred gender.³¹⁻³³

This study therefore aims at establishing the proportion of women who want to know fetal gender during prenatal ultrasound and the reasons behind this preference as well as comparing the findings with studies elsewhere nationally and internationally. The study also seeks to correlate the effect of other socio-demographic factors on the women's preferences.

MATERIALS AND METHODS

This was a twelve months' cross-sectional descriptive prospective analysis of all pregnant women, 16 weeks and above who presented at the Department of Radiology, Benue State University Teaching Hospital (BSUTH), Makurdi, North-central Nigeria, for antenatal ultrasound from 7th May 2019 to 6th May 2020. The department has three consultant radiologists and offers ultrasound services with a large turnout of obstetric clients drawn from within and outside the state. The Institutional Ethics and research review Committee approved this study.

Sample size was obtained based on the formula $[Z = P \times Q (E/d)^2]$ ²⁸ where:

P = the probability of choosing a male or female baby = 50%

Q = 100 - P = 100 - 50 = 50;

E = chosen error margin at 95% confidence interval = 5%

d = standard error at 95% confidence interval which is 1.96

Therefore, $Z = 50 \times 50 (5/1.96)^2 = 163$

However, 250 sample size was chosen to increase the statistical power of the study.

Recruited for the study were consecutive pregnant women at 16 weeks' gestation or more who were attending antenatal care (ANC) at Benue State University Teaching Hospital (BSUTH) Makurdi. They were referred for ultrasonography by health-care givers in the health facility or surrounding hospital for routine or specific obstetric indication(s). Occasionally a pregnant woman came on her own or would voluntarily consent to participate in the study, after counseling. The exclusion criteria were pregnant women who presented at below 16 weeks gestation, those that voluntarily declined participation in the study and all emergency prenatal ultrasound with complicated pregnancies.

Those that fulfilled the inclusion criteria were asked by the sonologist during the scan if they wanted to know the gender of the fetus by answering YES or NO. Those that were keen; received disclosure, while those that declined had their wishes respected or upheld and their reasons documented. The data collection instrument was a 6-section (A-F) semi structured and self-administered completion questionnaire designed in line with the purpose of the study. Sonographic examination was done using Siemens Sonoline G-50 machine fitted with a curvilinear 2.0-5.0MHZ transabdominal transducer. Fetal gender was identified by the presence of sonographic features of external genitalia at the perineum. The male fetus was recognized by the presence of the scrotal sac which appeared as a rounded echogenic structure separated by an echogenic median raphe. The phallus, in front was seen as an echogenic cylindrical structure (Figure 1). The female fetus was recognized by two labial folds, visualized as two oblong echogenic perineal structures separated by an echo-free area (Figure 2).

Information including age, socio-demographic data, parity and indication for scan were entered into statistical package for social science (SPSS) version 23 software for analysis. Results were presented as frequencies and proportions for categorical data and mean $\pm$ SD for continuous variables. Correlations were

Figure 2: Sonographic features of external genitalia of a female fetus

Figure 1: Sonographic features of external genitalia of a male fetus

used to test the relationship between one variable and another. P values ≤ 0.005 was considered significant for the study population.

Informed written consent was obtained from the clients after the nature, aim and objectives of the study were explained to them in the language they best understood. Consenting participant signed a consent form or appended their thumb prints appropriately. Anonymity of the participants was assured and they were at unlimited liberty to deny consent for or opt out of the study without any consequences.

RESULTS

Two hundred and fifty (250) pregnant women of mean age 28.75 ± 4.7 years were included in the study, of

Table 1: General characteristics of the pregnant women (n=250)

Variable	Frequency	Percentage (%)
Age		
<20	5	2.0
20 – 30	161	64.4
30 – 40	81	32.4
40 – 50	3	1.2
Religion		
Christianity	246	98.4
Islam	4	1.6
Education		
None	4	1.6
Primary	5	2.0
Secondary	46	18.4
Tertiary	195	78.0
Tribe		
Tiv	169	67.6
Idoma	38	15.2
Igbo	16	6.4
Igede	9	3.6
Yoruba	3	1.2
Etulo	4	1.6
Igala	5	2.0
Agatu	2	0.8
Others	4	1.6
Occupation		
Health workers	35	14.0
Civil servant	78	31.2
Applicant	25	10.0
Farmer	7	2.8
Student	48	19.2
Trader	36	14.4
Hair dresser	5	2.0
Business	11	4.4
Tailor	3	1.2
Lawyer	1	0.4
Teacher	1	0.4

Table 1 Continued:

Preference for fetal gender disclosure			
Yes	233	93.2	
No	17	6.8	
Desire for particular gender			
Male	72	28.8	
Female	45	18.0	
Any	133	53.2	
Gravidity			
Primid	62	24.8	
Multigravidae	188	75.2	
Parity			
Nulliparous	79	31.6	
Primiparous	67	26.8	
Multiparous	104	41.6	
Previous miscarriages			
Yes	55	22.0	
No	195	78.0	

which 161(64.4%) were aged 20-30years. The majority 246(98.4%) of women were Christians, while 4(1.6%) were Muslims. Regarding their educational qualifications, majority 195(78.0%) were university graduates or had attained tertiary education level, while 4(1.6%) were illiterates. Forty-six (18.4 %) women had secondary or intermediate level education and 5(2.0%) had primary school certificate. Ethnicity included 169(67.6%) TIV, 38(15.2%) Idoma and 16(6.4%) Igbo speaking nationalities majorly. A good number 78(31.2%) of the women were civil servants and students 48(19.2%). In all, 233(93.2%) women preferred prenatal fetal gender disclosure, 17(6.8%) women did not. Seventy-two (28.8%) women had the desire for a male child, 45(18.0%) desired a female, while 133(53.2%) had no particular gender desire. Sixty-two (24.8%) women were primigravida and 188(75.2%) were multigravida with 104(41.6%)

multiparous women. No history of previous miscarriages was obtained in 195(78.0%) women, while 55(22.0%) women had an unfortunate history of previous miscarriages (Table 1).

Figure 3 shows the reasons for interest in fetal gender disclosure. This was majorly due to easier choice of

clothing and naming in 74(32.3%) women. Other reasons included curiosity, personal satisfaction, husband insistence, family planning, first child is girl, sex balancing and to avoid surprise respectively.

Figure 4 shows the reasons for having no interest in fetal gender disclosure. That “any child is good” was cited by 16(44.4%) women as the major reason for not wanting to know the baby’s gender. Other reasons were God’s choice is best, prefer surprise, previous children

Figure 3: Reasons for wanting to know fetal gender

Figure 4: Reasons for not wanting to know fetal gender

are mixed gender and that it was personal respectively. There was no statistically significant correlation between gender preferences and the other variables such as age, educational attainment, tribe and previous miscarriages ($P=0.136, 0.485, 0.275$ and 0.942 respectively). A negative association was found between gender preferences and religion, gravidity as well as parity ($p=-0.255, -0.254, -0.093$ respectively).

DISCUSSION

Most of the women 233(93.2%) in our study wanted to know the fetal gender of their unborn child. And in spite of the variation in the sample size, our percentage value of 93.2% was slightly lower, but comparable to the analysis by Maaji SM *et al*²⁹ and Ngwan SD *et al*,³⁰ who separately reported 190(94.5%) and 173(96.0%) women who consented to disclosure of fetal gender during prenatal ultrasound. Our percentage value was, however higher than earlier reported values of 225(90%), 1211(81.8%), 166(40.0%) and 482(61.0%) by Okeke TC *et al*,²⁸ Eze CU *et al*,³¹ Ezugworie JO *et al*³² and Ohagwu CC *et al*,³³ respectively. This was not surprising particularly in our case as 195(78.0%) of the pregnant women were university graduates or had attained tertiary educational level and therefore likely to be inquisitive enough to request for fetal gender disclosure at prenatal ultrasound. But this may just be coincidental, requiring further research, as a review of the educational status of these women in the current and the other previous studies above did not show a consistent significant pattern of gender preference with educational attainment. Indeed, we did not find a statistically significant correlation between gender preferences and some other variables such as age, tribe, previous marriages, religion and parity ($P=0.136, 0.275, 0.942, -0.255, -0.093$ respectively) in our study. Earlier analysis by Ezugworie JO *et al*,³² also showed no statistically significant association between gender preferences and those who planned their pregnancy, those who needed more children and those

who detected problem in their pregnancy ($P=0.322, 0.022$, and 0.084 respectively). A report by Shukar-ud-din S *et al*,³⁴ further corroborated our finding of no significant association between gender preference and ethnicity ($P=0.102$) or gender of previous babies ($P=0.31$ males and $P=0.451$ females). As such, it is possible that most of these women just wanted gender disclosure purely to test the accuracy of the ultrasound findings after delivery.^{29,30}

In our study, easier choice of clothing and naming was the main motivating factor for wanting prenatal gender disclosure in 74(29.6%) women. This figure was quantitatively lower than earlier reports by Okeke TC *et al*²⁸ and Ngwan SD *et al*,³⁰ but largely synonymous with the main reasons for gender disclosure in their research, which was to know clothes to buy before delivery and plan for the newborn in 98(57.0%) and 118(52.4%) women respectively. This was, however in sharp contrast to the submission by Ezugworie JO *et al*³² and Ohagwu CC *et al*³³ which reported the main reasons for gender disclosure to be family pressure and the need to protect their marriage/cementing their places in their husbands' hearts in 274(65.9%) and 175(22.2%) women respectively.

A small number 17(6.8%) of women in our study had their wishes respected as they expressed no interest in knowing the fetal gender. This figure was slightly higher than the 11(5.5%) and 7(4.0%) women who declined disclosure as reported by Maaji SM *et al*²⁹ and Ngwan SD *et al*³⁰ but inconsistent with findings by Okeke TC *et al*²⁸ and Shukar-ud-din S *et al*³⁴ who reported 25(10%) and 153(68.6%) women respectively that did not consent to fetal gender disclosure. The commonest reason for not wanting to know the fetal gender in our study was that any child is good 16(44.4%). Other reasons included God's choice is the best 12(33.3%), personal and previous children are mixed sex 2(5.6%) as well as preference for surprise 4(11.1%). Clearly not all women were well disposed to knowing the fetal gender. Their reasons were varied but similar to the ones reported in previous studies.^{29,30,34}

A question therefore arises whether the sonologist should wait for the women to request for gender disclosure during prenatal ultrasound scan or to preemptively ask the woman if she is interested in prenatal gender disclosure. It would appear that disclosure to only those that ask seems appropriate, since majority of our patients were highly educated and inquisitive enough, while simply symbolizing the fetal gender on the written report for the referring health provider will suffice for those that might not care or be too reluctant to ask for disclosure.^{29,30} Male gender preference is widespread and worldwide²²⁻²⁴ with strong discrimination against the female gender.³³ In our study, 72(28.8%) women preferred to have a male baby; against 45(18.0%) who rooted for a female. Findings by Ohagwu CC *et al*³³ however, showed a male preference in 463(58.6%) women. Important reasons for this include a perception; correctly or wrongly in our environment that, among other things, social support and propagation of the family name is better achievable by the male child. Conscious efforts must, therefore be made to mitigate the considerable psychological anxiety that can be associated with prenatal gender disclosure. Disclosure of undesired fetal gender may be all that is needed to trigger a loss of interest in the pregnancy,³³ most often leading to gender-selective abortion, depression and even broken marriages in many communities.

CONCLUSION

Our study shows that a significant percentage (93.2%) of pregnant women wanted to know the gender of their unborn child, therefore, the deliberate policy of non-disclosure on account of non-medical indication is untenable in our environment, thus re-asserting our duty to disclose this vital information during prenatal ultrasound, when it is requested. The fact that a small percentage of women (6.8%) in the current study declined disclosure means that even when fetal gender has been successfully determined, we should be magnanimous enough to respect the patient's request

for non-disclosure. The findings also show a male gender preference in 72(28.8%) of women which is most-likely responsible for some of these women seeking fetal gender disclosure, presumably influenced by socio-demographic factors. If this attitude is allowed to continue without government intervention, we anticipate that male gender preference by these women, may lead to the acceptance of gender selection technologies and even gender-selective abortion, with consequent future masculinization of the adult population due to a preferential tilt of the sex ratio at birth (SRB) in favor of males, and it's resultant psycho-social repercussions in our community.

Recommendation

The Nigerian ultrasound community, when compared to other developed countries, faces a future tradition of increasing litigation, as such sonographers who need to determine the fetal gender should routinely obtain a written consent from the patient and be very thorough in their methodology, so as to improve on the accuracy of the results. Relatedly, it is most professional for fetal gender to be accurately assessed by trained sonographers as it appears ultrasonography is the only means available to most Nigerian women to assess chromosome-related abnormalities. As such information should pre-emptively be given to mothers about the errors and failure rates of sonographic gender determination before and during disclosure. Following the above submission, it is highly recommended that both the federal and state governments as well as private agencies should provide modern sophisticated ultrasound equipment in our hospitals and clinics. This will assist in the early and accurate determination of fetal gender even in the first trimester. Highly trained and adequately equipped manpower should also be available for deployment in advanced technologies needed in harmonic ultrasound imaging, amniocentesis, cordocentesis and karyotyping, so that our local results can be comparable to the wider national and international community.

Limitations

The relatively small sample size used, coupled with the restriction of this study to only women in Makurdi, constitute limitations on the study. With these limitations in mind, caution must be exercised while interpreting the findings, as they may not be a true representation of all the women in Nigeria.

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Conflict of interests

The authors report no conflict of interest in this work

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