ULTRASONOGRAPHIC DETERMINATION OF FETAL SEX - A STUDY ON 630 CASES IN BANGLADESH

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ABSTRACT

Ultrasound examination of the fetal perineal area was done in third trimester of pregnancy to determine the fetal sex. We carried out ultrasound on 621 consecutive obstetrics patients who attended these centers for obstetric causes referred by their physicians. Of them 612 had singleton pregnancy and 9 had twin pregnancy. We attempted to determine the sex of all fetuses (n=630) based on demonstration of male and female genitalia. In 585 pregnancies, fetal genitalia were well visualized - the accuracy rate was thus 92.9%, while the rest 7.1% (n=45) could not be determined which was limited by fetal presentation, position, volume of amniotic fluid and colonic gas. Among the correctly determined cases 384 (65.6%) were male and the rest 201 (34.4%) were female. About 91% of the mother desired a male child in contrast to only 3.1% of the mother who desired a female child prior to ultrasound examination. Interesting enough mothers welcoming female child were all multigravida with previous male child/children. It needs to mention here that no primae mother welcomed female child. Some other aspects of prenatal sex determination have also been discussed in this article.

Key Words: Ultrasound, Fetal sex, Bangladesh

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INTRODUCTION

Prenatal sex determination is a very delicate thing. The prediction of fetal sex is of intense interest to the expectant mother.¹ Medical personnel who deal with pregnant patients often encounter requests for the prediction of fetal sex. Apart from patient, there is also medical usefulness for demonstration of fetal sex in utero such as X-linked recessive disorders.² Invasive techniques such as amniocentesis, fetoscopy and amniography have all been used to predict the sex of the fetus. But non-invasive obstetric ultrasonography may also reliably furnish this type of assessment during gestation.³ The fetal sex can be revealed as early as 14 weeks but its reliability increases from 28 weeks of gestation as fetal testicles usually descends into the scrotum at this time.^{4,5,6}

Although to date ultrasonographic examination remains the most popular and easily accessible method to detect fetal sex in Bangladesh, still intra-uterine sex determination is not considered a basis for requesting a ultrasonographic examination of a fetus in Bangladesh. Like many parts of the world, in Bangladesh economic and social pressure act to make sons much more desirable than daughters. In order to prevent termination of pregnancies for female fetuses, doctors are often reluctant to tell the party about the sex of the fetus to avoid complicated ethical and moral issues.

Although isolated comments on the ultrasonographic determination of fetal sex have been made in Bangladesh, its accuracy and technique has not been sufficient because determination of the female fetus was done by exclusion.^{7,8} We reviewed our experience at two clinics of Bangladesh for determination of fetal sex during the third trimester of pregnancy.

MATERIALS AND METHODS

The data was collected from Gareeb Nawaz Clinic in Khulna and Sheba Clinic in Dhaka from May 1992 to July 1994. Study population was the mothers in the third trimester who were sent to these clinics for ultrasonography by their physicians for various obstetrics reasons. Sample size consisted of 621 mothers (9 with twin pregnancy) who gave informed consent were scanned for fetal sex during this period. Ultrasonographic assessment of fetuses was done according to the demand of the referring obstetrician and general practitioners. Fetal sex can be best determined in third trimester of pregnancy with great ease and accuracy. Before that period the accuracy rate seems to be lower.³

The goal of the ultrasonography for this study was to visualize the fetal perineum in both coronal and transverse planes. Preferably the fetus should be in a longitudinal lie, presenting by its cephalic pole, its back to either lateral aspect of the uterus and the hips flexed. In that position exploration of successive planes perpendicular and ventral to the lower fetal back, just below the level of fetal bladder, would reveal the fetal perineum. If the fetal genitalia was not seen on this image, the probe was moved slightly back and forth, as the fetal genitalia often lie just behind the plane of the femurs. The fetus was designated as female not by the absence of these structures but by demonstration of female external genitalia (labia). If neither image was seen, the examination was considered as a failure and was noted as such. The total scanning time was 30 minutes, and no efforts or manipulation was employed during the scanning period.

Before the examination a short interview lasting 5 minutes was conducted by using a structured questionnaire. It was assured that their

Table III
Indications for ultrasonographic examination
of Pregnant mothers (n=621)

Prior to undergoing the ultrasonographic examination, we asked all the mothers to express their preferences for the sex of their child. In reply 90.8% (n=564) expressed their preference for a male child from the current pregnancy. Mothers having previous girl/girls were all included in this group. Only 19 (3.1%) mothers expressed preference for a female child and interestingly none of them were primae. The rest 38 (6.1%) expressed no choice for any particular gender. The 19 mothers who expressed their desire for a female child were all multigravida, have at-least one male child and belonged to either middle or rich income group (as per GK criteria). Mothers desiring female child and getting a male one had a mixed reaction (n=11). But mothers desiring a male child and getting a female one clearly expressed unhappiness over the outcome in most cases (n= 168).

DISCUSSION

In this study the accuracy of fetal sex determination was 92.9%. This finding is congruent with that of Stalker.⁹ Although the authors found a higher rate of accuracy with increasing gestational age, but some authors faced difficulties in determining sex with higher gestational age.^{10,11} It may be due to the small number of pregnant women in our study with higher gestational age group. Fetal sex

prediction before the 28th week age should be made cautiously until additional experience is combined with the use of higher resolution scanners and a proved record of accuracy. Even then in our study, sex could not be determined in 45 cases for various reasons including masking of sex organs by pelvic bones as in engaged breech position, little amniotic fluid, maternal colonic gas shadow, fetal hyperactivity, crowding of fetal parts and increased fat in the maternal anterior wall etc. Study of Mahony has suggested that even adequate perineal visualization may yield incorrect intrauterine sex determination in 3% cases.³ So the sonologists should always bear in mind this fact and should not give surety of his findings regarding fetal sex in any case. Chromosomal analysis following an invasive process like amniocentesis may detect fetal sex very reliably from 16 weeks of gestation.^{5,13}

We did not have the scope to follow up all the scanned cases as our cases were referred from different distant places. Therefore we failed to determine the exact percentage of false positive cases (or errors) in our study. We were able to follow up only a few number (n=27) of cases who delivered their child in these two clinics. We didn't find any false positive cases in this small number. One study has shown that the chance of false positive case is more in female than in male sex determination.⁹

In this study, the highest number of mothers referred to us was for gestational age determination and this was different from some other studies.^{9,14} It was followed by assessment of fetal growth and placental localization. In our study no cases were referred to us for detection for some rare conditions that had been mentioned by some other studies.^{3,5,12} In this society it is not very uncommon for women to forget the last menstrual period and the doctor frequently faces problems in determining the gestational age by simply measuring the fundal height of the uterus as a lot of fetuses are small for

date due to the overall malnutrition of the mother .

A large number of mothers undergoing ultrasonographic examination showed interest about the sex of their fetuses, although sex determination was not a routine part of our examination. This figure was higher than the study conducted by Ansari.⁷ But when this result was stratified by education and income it was seen that the distribution pattern was fairly similar . Being highly educated and being economically solvent were more likely to lead to know fetal sex. Our study included a good number of cases from the capital city (who usually have higher level of education and income) that might have influenced the attitude of increased number of people to know the fetal sex.

Medical technology advancements may help us to make a lot of diagnosis or prediction - but it is important to note the context in which the technology could be used or abused. In the context of Bangladesh where the socio-economic environment makes the people to be more intend for sons rather than daughters, there is a high possibility of misuse of technology to detect sex.^{15,16}

Its implication may affect this society in a lot of ways. Prenatal sex determination at any stage of pregnancy may increase the rate of criminal abortion that may lead to gross demographic disparities which only will heighten the existing problem. The mental effect and the way she is treated during the pregnancy by her family after the disclosure of fetal sex may, in turn, affect adversely on the intrauterine growth of the fetus. Thus its medical and social consequence is an obligation to ethical point of view. In addition, disclosure of unexpected prenatal sex of a child may create an embarrassing situation for the reporting physician. This is not to say that this type of study should not be performed but to emphasize the potential gravity of a seemingly frivolous

declaration. With respect to fetal and maternal health and considering the social demand it is the responsibility of the physician to handle the situation tactfully and satisfy the clients without burdening own morality. We recommend that the doctor should be absolutely sure of the diagnosis before disclosure or decline to pass any opinion.

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REFERENCE

1. Datta NR, Ahmed H, Paul N. Radiological method of fetal sex determination. *Bangladesh Med J* 1993; 1:5-8.
2. Saunders RC. *Clinical Sonography*. 2nd ed. New York: Nancy Smith Miner, 1991:100-2.
3. Mahony B. *Ultrasonography in Obstetrics and Gynaecology*. 2nd ed. Washington: Peter W Callen, 1988: 272-4.
4. Fleischer AC, James E. *Introduction to diagnostic sonography*. New York: Weilly Medical Publication, 1986:67-8.
5. Hadlock FP. *Ultrasound in Obstetrics and Gynaecology*. 2nd ed. Albany: Elmer Publishers, 1985: 20-23.
6. Sabagha RE. The use of ultrasound in defining gestational age. In: Hobihis JC Ed. *Diagnostic ultrasound in Obstetrics*. New York: Churchill Livingstone, 1979:23-40.
7. Ansari SM, Paul AK, Karim MR et al. Fetal sex determination - Its social impact and role of the concerned Physician: A contemporary concept. *Bangladesh Med J Khulna* 1996; 29: 6-7.
8. Miah SR. Fetal sex determination and related debate. *The Daily Janakhantha* 1997. Jul 24; 13.

9. Stacker J, Evens L. Fetal sex determination by Ultrasound. *Obstet Gynecol* 1977; 79: 653-5.
10. Plattner G, Renner W, Went J, Beaudette L, Viau G. Fetal sex determination by ultrasound scan in the second and third trimester. *Obstet Gynecol* 1983; 61: 454-8.
11. Shalev'E, Weiner E, Zuckerman H. Ultrasound determination of fetal sex. *Am J Obstet Gynecol* 1981; 141:582-3.
12. Scholly TA, Sutphen JH, Hitchcock DA, Mackey SC, Langstaff IM. Sonographic determination of fetal gender. *American J Roentgenology* 1980; 135:1161-5.
13. Langman J. *Medical Embryology*. 7th ed. Baltimore: Williams and Wilkins, 1995: 301-4.
14. Lavery P, Miller SA, Stauffer RA, Wygal J. Fetal sex determined by ultrasound. *Southern Med J* 1983; 76: 205-6.
15. Khosia T. Plight of female infants in India. *J Epid Commu Health* 1980; 34: 143-6.
16. Miller ED. *The endangered sex: Neglect of female children in rural India*. New York: Cornell University Press, 1981: 52-5.

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