



## SOCIAL ISSUES IN REPRODUCTIVE HEALTH

# Implications of incorrect determination of fetal sex by ultrasound

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### KEYWORDS

Ultrasound;  
Fetal sex;  
Domestic violence

### Abstract

**Objective:** To assess the experiences of women following incorrect determination of fetal sex by ultrasound. **Method:** A 3-year prospective cohort study of 102 women with discordance between fetal sex determined by ultrasound scan and birth sex. Participants were interviewed using 2 structured pretested questionnaires. The first questionnaire was undertaken within 24 h of delivery. The women were followed up with a second questionnaire 6–9 months later. In-depth interviews were also carried out at this time. **Results:** Women who had received an incorrect determination of fetal sex by ultrasound experienced marital conflicts, domestic violence, negative perceptions of ultrasound, and a desire for reversal of tubal ligation. **Conclusion:** Incorrect determination of fetal sex by ultrasound has implications that can affect the mental and psychological health of the mother and the upbringing of the newborn.

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## 1. Introduction

The use of ultrasound to determine fetal sex has been discussed extensively in the medical literature [1–4] and its accuracy ranges from 86.5% [3] to 99% [4]; however, most women who had an ultrasound scan to determine fetal sex had expectations that exceeded the purpose and ability of the examination [5].

Factors influencing parental desire to know the sex of the unborn child include sex preference, family relocation or renovation of property based on fetal sex, and plans for

future offspring [2]. Some studies have suggested that knowledge of fetal sex can influence parental attitude to the pregnancy [6].

## 2. Subjects and method

The study was conducted at the University of Nigeria Teaching Hospital and Aghaeze Hospital, Enugu, Nigeria, between January 2004 and December 2006. The former is a tertiary health centre that serves as a referral centre for the southeastern Nigerian states of Ebonyi, Imo, Anambara, Abia, and Benue. Aghaeze Hospital is a women's hospital located in Enugu city. Fetal sex is not routinely determined during ultrasound examination at these centers unless requested by the mother.

The study population consisted of women who had delivered babies whose birth sex differed from the sex determined during

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**Table 1** Reasons for requesting determination of fetal sex given by the study participants

Reason	Study participants (n=102)
Parental sex preference	56 (54.9)
Planning and preparation	25 (24.5)
Plans for bilateral tubal ligation	11 (10.8)
No reason given	10 (9.8)

Values are given as numbers (percentage).

the antenatal ultrasound scan at the study centers. The study variables included the reason why fetal sex determination was requested, maternal feelings toward the newborn, perceptions of ultrasound following an incorrect determination, and other effects reported by the women.

All women who delivered at the centers within the study period were interviewed within 24 h of birth to establish those who had requested fetal sex determination during antenatal ultrasound examination. The ultrasound reports of these women were examined to ascertain whether the ultrasound-determined sex corresponded with the birth sex. After consent had been obtained, the women who had given birth to babies where the sex at birth differed from the sex determined by ultrasound were recruited into the study, and the first questionnaires were undertaken.

The first questionnaire contained closed and open-ended questions and assessed sociodemographic data, parity, sex of previous children, reasons for requesting prenatal sex determination, preferred sex of the newborn, and feelings of the mother toward the newborn at delivery. The women were followed up at the infant immunization centers of the hospitals between 6 and 9 months later, when a second questionnaire was recorded. The second questionnaire was designed to obtain information on the impact of the incorrect determination on the women and their partners. This questionnaire also contained closed and open-ended questions. Both questionnaires were designed following a pretest pilot study, and were undertaken by the researchers and 2 trained assistants.

Maternal feelings toward the newborn at delivery were assessed in the first questionnaire with the closed-ended question: "What were your feelings about the baby when you realized that the sex of your baby was different from what the ultrasound scan detected during pregnancy?" The responses used a sliding scale from 1 to 5: 1 = very positive, and 5 = very negative. In the second questionnaire the effect of the incorrect determination of fetal sex on maternal perception of ultrasound was assessed with the question: "Do you think that your experience following the wrong determination of your baby's sex by ultrasound has changed your perceptions of ultrasound scanning?" The response options were "yes" or "no." This was followed by the question: "If you ticked yes above, what is your current perception of ultrasound scan?" The response options used a sliding scale from 1 to 4: 1 = very positive, and 4 = very negative.

Detailed verbal interviews of the women were carried out after completion of the second questionnaire. This involved a one-to-one discussion between a participant and a researcher [7] to gain more insight into the previous answers given. The issues discussed included the reasons for sex preference, the reasons for the woman's feelings toward her newborn, and the factors behind the woman's experiences following incorrect determination of fetal sex, which had already been indicated in

the second questionnaire. The interviews were carried out in English by 2 trained interviewers.

The general characteristics of the respondents were analyzed with descriptive statistics. Content analysis was used to identify the recurrent themes and subsequently group the responses to the open-ended questions. The responses to the in-depth interviews were also analyzed for content.

To determine the maternal feelings toward the newborn, the response alternatives were grouped into 3 categories: "very positive" and "positive" (Category 1); "mixed feelings" (Category 2); and "very negative" and "negative" (Category 3). Maternal perceptions of ultrasound after incorrect fetal sex determination were also categorized into 2 categories: "very positive" and "positive" (Category 1); and "very negative" and "negative" (Category 2). The data were analyzed using SPSS version 10.0. (SPSS Inc., Chicago, IL, USA).

### 3. Results

A total of 2860 deliveries took place within the study period and 108 women were recruited into the study; 102 could be followed up at the infant immunization centers and were included in the final analysis. The mean age of the respondents was  $28.2 \pm 10.6$  years (range, 16–42); 19 (18.6%) women were primipara, 56 (54.9%) were multipara, and 27 (26.5%) were grand multipara. Seven (6.9%) women were educated to primary school level, 46 (45.1%) were educated to secondary school level, and 49 (48.0%) were university educated.

For 53 (52%) women, the reason they had requested sex determination was parental sex preference. The preferred sex of the fetus was male for 46 (45.1%) women and female for 7 (6.9%) women. Twenty-five (24.5%) requests for fetal sex determination were to assist the parents in preparing for the newborn and 11 (10.8%) were due to plans for bilateral tubal ligation at the time of cesarean delivery. Ten (9.8%) women gave no particular reason, and 3 (2.9%) requested fetal sex determination because they were unmarried and preferred female babies (Table 1).

When questioned about their immediate feelings toward their newborn, 28 (27.5%) women had positive feelings, 12 (11.8%) had mixed feelings, and 62 (60.8%) had negative feelings (Table 2). Further analysis showed that all 62 women who had negative feelings toward their newborns preferred male babies, and all of them had been told that the fetal sex was male using ultrasound, but had subsequently delivered female babies.

The postbirth experiences reported by the women were grouped into 5 major headings. Thirty-nine (38.2%) women reported marital conflicts, while physical assault from their partners was reported by 9 (8.8%) women. The ultrasound

**Table 2** Maternal feelings of the study participants toward their newborns

Maternal feelings	Study participants (n=102)
Positive	28 (27.5)
Mixed	12 (11.8)
Negative	62 (60.8)

Values are given as numbers (percentage).

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