FETAL SEX DETERMINATION BY ULTRASONOGRAPHY

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SUMMARY

Ultrasonologist who deal with pregnant patients invariably encounter requests for the possible identification of the sex of the unborn child. With the recent advancement in real time imaging sex of the fetus can often be determined with the routine exploration of the fetal perineal area by identifying the fetal scrotum and penis or labia in fetuses of 26 weeks gestation or older.

The present review summarises 555 patients who underwent ultrasonographic examination for various indications from 26 weeks of gestation in whom the diagnosis of the sex of the fetus was possible. The accuracy rate was 99.70% for the labelled males and 93.78% for the labelled females. Increased amount of liquor cephalic presentation with back lateral facilitated the findings of determination of sex of the fetus in utero.

Introduction

Ultrasonologist who deal with pregnant patients invariably encounter requests for the possible identification of the sex of the unborn child. Obstetric ultra-sound may safely furnish this identification during the latter stage of second trimester and during the third trimester of pregnancy.

With the recent advancement in real time imaging, sex (Plattener *et al* 1983) of the fetus can often be determined with the routine exploration of the fetal perineal area by identifying the fetal scrotum and penis or labia in the fetuses of 26 week gestation or older.

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Material and Methods

The present review summarises 555 patients who underwent ultrasonographic examinations for various indications from 26 weeks of gestation in whom the diagnosis of the sex of the fetus was possible. Scans were done by using Real time scanner with 32 grey scales. No per abdominal manipulation of the fetal position was done to facilitate the examination of the fetal perineal area on ultrasonography.

The technique employed was to orientate the transducer transversely to the fetal abdomen and then to scan caudad till the fetal perineum was reached. The fetal full bladder and femur formed a useful landmark. Once the area of the fetal perineum was found, the transducer plane was oriented parallel to the long axis of the

femurs and an attempt was made to visualise the fetal genitalia. If the fetal genitalia were not seen on this image, the transducer was moved slightly back and forth, as the fetal genitalia often lie just behind the plane of the femur. Male fetuses were determined by seeing the scrotum and penis, whereas female fetuses were determined by visualisation of the labia and in difficult cases, occasionally by absence of male genitalia. Cross sections from limbs or cord loops have to be care fully differentiated from this genital image.

Results

Sex determination of the fetus in utero was possible in 555 patients with singleten pregnancies out of the total of 1498 pregnancies.

All these patients underwent ultrasonographic examination for the various indications (Table I) from 26 weeks of gestation. An attempt was made to diagnose the sex of the fetus in utero in these patients. No sonography was done specifically for the identification of the sex of the fetus in utero. Validity of the diagnosis of the sex of the fetus was taken from the records at the time of delivery.

TABLE I

Main Indications for USG Examinations in 1498 Pregnancies

Indications	No. of patients	%
1. Assessment of Gestational age	1112	74.23
2. Placental localisation	109	7.27
3. Assessment of fetal lie and presentation	84	5.61
4. Assessment of fetal viability	76	5.07
5. Assessment of fetal growth (IUGR)	64	4.27
6. Suspected twin gestation	31	2.07
7. Assessment of excess liquor	22	1.48
Total	1478	100

Sex determination was more easily possible from 32 weeks onwards till 37 weeks of gestation (Table II). After 37 weeks of gestation, the presence of physiologic relative oligohydramnios results in crowding of the fetal perineal area and hence slight decrease in the incidence of sex determination.

TABLE II

Incidence of Sexed Cases Per Gestational Age

Weeks of gestation	Percentage
26	23.33
27	10.10
28	28.42
29	20.78
30	29.91
31	30.84
32	53.40
33	33.58
34	51.85
35	58.27
36	36.81
37	50.98
38	36.36
39	31.11
40	41.82

Overall incidence: N—555/1498—37.05%.

Cephalic presentation, fetal back lateral presence of enough or excess amount of amniotic fluid and placenta not too close to the fetal parts facilitated the determination of sex in 50.20% of the cases. With non-cephalic presentation with back anterior or posterior and with oligohydramnios, sex determination was feasible only in 11.41% of the cases (Table III).

TABLE III

Incidence of Sexed Cases Per Combination of Fetal Presentation Position and Estimated Amount of Amniotic Fluid (N = 1498)

	No. of cases	%
Cephalic presentation—back lateral, hydramnios/ normal amniotic fluid, placenta not too close to fetal parts	497/990	50.20
Non-cephalic or back anterior/posterior, oligo-hydramnios	58/508	11.41

Sex determination of singleton fetuses was possible in 555 cases with an overall accuracy rate of 95.86%. 99.70% for the labelled males aad 93.78% for the labelled females (Fig. 1). In 12 cases, the

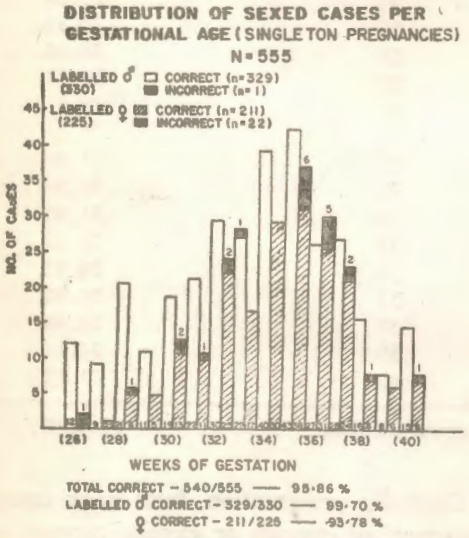

Fig. 1

diagnosis of the sex of the baby was not correct. In 1 case, the presence of hypertrophied labia led to the wrong prediction of male baby in utero. In other 11 cases, various factors contributed to the wrong prediction of female fetus in utero. Six of these patients had very scanty liquor, 2 cases had fetal perineal area very close to the placenta and 3 cases had non-cephalic presentation with scanty liquor.

Discussion

In pregnancies of greater than 26 weeks, scanning of the fetal perineal area can reveal the sex of the fetus with an accuracy rate of about 95%, if the ideal conditions and expert sonologist are present. A repeat scan can improve both the incidence and accuracy of the ability to diagnose the sex of the fetus.

Prior to 26 weeks of gestation, the development of the external genitalia does not allow for the reliable differentiation of scrotum and penis of the male fetus from that of labial bulge and relatively large clitoris of the female fetus.

The diagnosis (Stocker, Evans 1977) of a male fetus (a positive finding of scrotum and penis) is very reliable. The diagnosis of a female fetus (a positive finding of labia) is quite reliable rather than mere absence of a positive finding of male fetus i.e. absence of scrotum or penis. The diagnosis of both sexes have been just as feasible through out the last 10-12 weeks of gestation.

Increased amount of liquor, cephalic presentation with back lateral facilitated the findings. Conditions such as (Scholly *et al* 1980) engaged breech, oligohydramnios, extended hips, anterior fetal back, close contact of fetal perineum to the placenta or uterine wall, presence of umbilical cord shadow between the legs of a female fetus, hyperactivity of the fetus makes the assessment difficult if not impossible.

The prediction of fetal sex in uterus has very limited, clinical value but still it poses potential danger and risk. The risk lies primarily in realm of psychological factor in the expectant parents, who may attach a great importance to it. Hence, sonographer should be fairly sure of the findings before declaring the sex of the baby to the expectant parents.

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