Towards first-trimester anomaly scan: a cohort study at a Single Chinese tertiary hospital

ZHENG Ming-ming, TANG Hui-rong, ZHANG Yan, RU Tong, HU Ya-li.
Department of Obstetrics and Gynecology, Nanjing Drum Tower Hospital. The Affiliated Hospital of Nanjing University Medical School, Nanjing, Jiangsu 210008, China

Objective
To assess the performance of first trimester ultrasound screening for fetal structural and chromosomal anomalies based on fetal NT and a detailed anomaly scan at 11-13+6 weeks' gestation in low risk population.

Methods
A prospective cohort study was conducted at Nanjing Drum Tower hospital in the period from December 2015 to March 2016.

Flow chart of the study

Record maternal characteristics and medical history if 45mm≤CRL≤84mm

Normal
High risk
Low risk
Abnormal
Normal
Abnormal
Normal
Normal

Perform an detailed early ultrasound scan and NT thickness

Combined screening

Perform second-trimester scan(20-24wks)

TOP Pathological anatomy

Perform an detailed early ultrasound scan and NT thickness

Abnormal

Offer CVS test

Save abnormalities

Abnormal

Normal

Third-trimester scan and follow up in neonatal period

Normal

Results
Detection rate of Major Structural Anomalies by Trimester

Outcome of the study

29 major structural abnormality: 2.25%of screening number

22 major structural abnormality (including 4 chromosomal abnormality)

15 TOP in the first trimester

1 selective fetocide

15 TOP in the second trimester

4 keep pregnant

7 new major findings

3 TOP in the second trimester

4 new mild findings

1090 second-trimester evolution including:

25 lost to contact

10 missed second trimester screening

6 miscarriage (including 2 twins)

9 TOP as requested (2 with NT>99th)

The Detected Major Structural Anomalies of the Study

Anomaly | FTS | STS | Outcome
---|---|---|---
Central nervous system

Anencephaly | 1 | 0 | TOP=1
Encephalocele | 3 | 0 | TOP=3
Holoprosencephaly | 0 | 1 | TOP=1

Cystic hygroma | 4 | 0 | TOP=4
Cardiac

AVSD | 2 | 0 | TOP=1
Tricuspid atresia | 1 | 0 | TOP=1
TOF | 1 | 2 | TOP=3
Right ventricle aneurysms | 1 | 0 |
Cleft palate/lips | 2 | 0 | TOP=2
Exomphalos | 2 | 0 | TOP=1, keep pregnant×1

Skeletal

Polydactyly | 1 | 0 | Keep pregnant=1
Talipes | 2 | 1 | Keep pregnant=3
Spinal bifida with megacystis | 1 | |
Renal

Renal agenesis | 0 | 2 | Keep pregnant=2
Cystic renal dysplasia | 0 | 1 | Keep pregnant=1
Annular band syndrome | 1 | 0 | TOP=1
Total of 1154 | 22 | 7 |
Total of 29 MSA, % | 75.9 | 24.1 |

Case | MA,y | Para | GA, wk/d | NT,mm | Ultrasound sonography | karyotype
---|---|---|---|---|---|---
1 | 28 | 0 | 12+2 | 13.9 | Cystic hygroma,HLHS | 45,XX
2 | 28 | 0 | 13+6 | 32.0 | Cystic hygroma,DORV,HLHS | 45,XX
3 | 30 | 0 | 12 | 6.1 | Cystic hygroma,AVSD | 47,XN.+21
4 | 24 | 0 | 12+6 | 11.6 | Cystic hygroma,AVSD, polydactyly | 45,XX

Conclusion
With systematic training detailed anomaly scan at 11-13 weeks' gestation can detect majority severe fetal structural and chromosomal anomalies.