Clinical significance of nuchal translucency measurement in routine prenatal examination

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To the Editor: Measurement of nuchal translucency (NT) is a validated marker for aneuploidy, fetal abnormalities, and other pathologic conditions,[1] which makes it crucial to ensure the accuracy of NT measurement in clinical treatment. Ever since 2012, all the pregnant women visiting our hospital (The International Peace Maternity & Child Health Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China) need to receive a routine first-trimester sonographic marker assessment. However, what is noticeably is that it is difficult to reach the standard section of every case and get accurate measurement data because of the time spent, the fetus position, the sonographers technique, and other factors. Even in the non-standard section, NT measurement is valuable in Prenatal Diagnostic Center. Therefore, the aim of this study was to assess the association between the adverse pregnancy outcome and the increased NT measurement, which will help with the counseling of women in our setup, thereby reducing birth defects.

This retrospective cohort study included all the consecutive singleton pregnant women who were screened for NT as a part of first trimester fetal screening in our hospital between January 2013 and December 2014. First-trimester screening data (11–13 +6 gestational weeks) combining maternal age, biochemistry (pregnancy-associated plasma protein-A and free ß-human chorionic gonadotrophin), and fetal NT were retrieved. Scanning was mainly performed by trained ultrasound doctors trans-abdominally. If the abdominal imaging was not satisfactory, trans-vaginal ultrasound examination was performed. NT measurements from 45 to 84 mm of crown-rump length were included. Women were offered fetal karyotyping if the combined calculated risk at sampling was ≥1/270 or NT ≥3.0 mm. NT was categorized into various groups. Group 1 (n = 22,872) includes NT less than 2.5 mm, while group 2 (n = 243) and group 3 (n = 37) include raised NT measurements from 2.5 to 2.9 mm and ≥3.0 mm, and group 4 (n = 49) includes NT ≥3.5 mm. Pregnant women with raised NT measurement but normal karyotype were offered monitoring with a normal scan at 20 to 24 weeks of gestation, fetal echo, and serial growth scans. Pregnancy outcomes were collected retrospectively from our database registry. This study was approved by the Ethics Committee of the International Peace Maternity & Child Health Hospital, Shanghai Jiao Tong University School of Medicine (No. GKLW 2017-82).

A total of 26,240 singleton pregnancies underwent NT screening, among whom 3039 (11.58%) cases were lost to follow-up and the remaining 23,201 cases were included in the study. The mean maternal age was 29 (range 19–46) years and the mean gestation age at scan was 11 (range 10–13 +6) gestational weeks. The population over 35 years old accounted for 4.19%. The measurement was ≥2.5 mm in 1.42% (329/23,201) of the cases, and ≥3 mm in 0.37% (86/23,201) of the cases. Among them, 22,884 (98.63%) cases gave live birth and 317 (1.37%) suffered from miscarriage, termination of pregnancy (chromosomal abnormalities or major structural anomalies), or stillbirth.

Increased NT among euploid fetuses may be associated with adverse pregnancy outcomes.[2] These include risks of structural abnormalities, miscarriage, fetal death, fetal growth restriction, and low birth weight, leading to an increase in perinatal morbidity and mortality rates. In our study, the percentage of live born fetuses decreased from 22,429 (98.06%) in the lowest NT group 1 (less than 2.5 mm) to 22 (44.90%) in the highest NT group 4 (≥3.5 mm). And the incidence of spontaneous abortions or fetal death in chromosomally normal fetuses increased from 0.68% (156/23,085) for NT measurements <3 mm, to 4.29% (3/70) for measurements ≥3 mm. In group 4, seven cases chose to terminate pregnancy due to fetal edema or neck hydrocystis. If these seven cases were included in stillbirth or abortion, the incidence was higher (14.29%, 10/70). The rate of structural abnormalities in raised NT group (≥3 mm) is 10.47% (9/86),
higher than that of the NT group (<3 mm, 0.72%). Of these, six (66.67%) cases were terminated.

The previous study has demonstrated that the rate of chromosomal abnormality increases with NT thickness from approximately 3.7% for those with NT between the 95th centile and 3.4 mm to over 21.1% for NT of 3.5 mm or more. Prenatal chromosome analysis was performed in 601 (2.59%) cases, of whom 46 (7.65%) had an abnormal karyotype. The abnormal chromosomes detection rate increased with the increase of NT measurement. The detection rate of abnormal chromosomes is 5.64% (30/532) for fetuses with NT <3.0 mm and 23.19%(16/69) for fetuses with NT ≥3.0 mm. Abnormal chromosomes were mainly concentrated in 21, 18, and 13 (23 cases of trisomy 21, 8 cases of trisomy 18 or trisomy 13, and 15 cases of other abnormalities). The detection rate of abnormal chromosomes was significantly different among the groups (P < 0.001).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

None.

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