

Ultrasonographic measurements of fetal thymus size and preterm birth predictors

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Introduction

As a multifactorial syndrome, prematurity involves infection, inflammatory process and the other unknown mechanisms. Some of the strategies to prevent preterm birth include transvaginal ultrasound, once short cervix length (CL) is a known preterm birth predictor and some studies suggest that amniotic fluid sludge (AFS) can be a signal of intraamniotic infection.

Latest studies have also demonstrated that fetal thymus can reduce due to apoptosis in response to fetal inflammatory response syndrome.

Objectives

The aim of this study is to analyze ultrasonographic measurements of fetal thymus size in pregnancies with positive preterm birth predictors and compare with pregnancies without such predictors.

Methods

Fifty five pregnant women were included in this prospective study. They were evaluated at the occasion of second trimester ultrasound. Measurements of cervix length, observation of amniotic fluid sludge (both by transvaginal ultrasonography) and fetal thymus size (transverse diameter and perimeter) were obtained. The fetal thymus was identified at the level of three-vessel view of the thorax and only one observer obtained thymus measurements. The data were transformed into z-scores (SD values from the mean) according to normative references.



Figure 1 - Ultrasonographic evaluation of fetal thymus at the level of three-vessel view of thorax : transverse diameter and perimeter.

	Short cervix length	Normal cervix length	p
Thymus transverse diameter, z-score	-0.16	-0.15	1.00
Thymus perimeter, z-score	-0.04	-0.14	0.50

Table 1 - Comparison of fetal thymus size between the group of short CL and the group of normal CL, after transforming data into z-score.

	AFS (+)	AFS (-)	p
Thymus transverse diameter, z-score	-0.29	-0.11	0.09
Thymus perimeter, z-score	-0.36	-0.07	0.24

Table 2 - Comparison of fetal thymus size between the group with AFS and the group without AFS, after transforming data into z-score.

Results

The mean maternal age was 27.5 years (SD=5.5) and 43.6% of the women were nulliparous. The mean gestation age at exam was 22.1 weeks (SD=1.2 weeks). It was found 16.3% of short cervix length (9/55) and 14.5% of amniotic fluid sludge (8/55). The group with short cervix length did not show statistical significance in fetal thymus size when compared with the group of normal CL (median z-score for thymus transverse diameter: -0.16 versus -0.15, P=1.0; and median z-score for thymus perimeter: -0.04 versus -0.14, P=0.50). But the group with amniotic fluid sludge seems to present smaller thymus when compared to the group without AFS (median z-score for transverse diameter: -0.29 versus -0.11, P=0.09; and median z-score for thymus perimeter: -0.36 versus -0.07, P=0.24).

Conclusion

These preliminary results show a tendency that amniotic fluid sludge may be involved in the reducing of thymus size, possibly a sign of intraamniotic chronic infection. But the case-groups (short CL and AFS) are insufficient in number to statistical significant results.

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