Threatening sign during pregnancy: thin and thick corpus callosum, an ultrasonographic morphometric analysis

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INTRODUCTION

Corpus callosum is the largest and most important of the forebrain commissural tracts connecting the two cerebral hemispheres. This white matter tract plays essential role in sensory, motor, and cognitive signal transmission across the right and left cerebral hemispheres.

Anatomically, the corpus callosum comprises five parts– rostrum, genu, body, isthmus, and splenium.[2] Genu is the most anterior region connecting the lateral and medial frontal lobes, while the splenium is the most posterior region. Body is the longest segment of corpus callosum, while isthmus is shorter and narrower area that lies between the posterior body and splenium.

OBJECTIVE:

This study aimed to determined the normal appearance and development of corpus callosum structure during the second half of pregnancy, and to investigate the potential correlation between corpus callosum length/thickness and possible foetal neurological anomalies.

METHODS

622 foetuses were scanned at mid-sagittal plane using trans vaginal ultrasound probe between 20 and 42-weeks' gestation. The length and thicknesses of the CC were measured in the midsagittal plane. The measurements were grouped, analysed, and compared with the standard measurements at similar gestational age, and have normal neurological development.

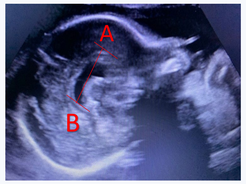

Fig.1: A mid sagittal ultrasonic image of the corpus callosum (CC) in a foetus 30Wk, showing the measurements of the length from point (A) genu and (B) splenium

The thin corpus callosum is an ominous finding during pregnancy; it is more likely to be linked to other neurological abnormalities, while thick corpus callosum is a rare and uncomplicated finding

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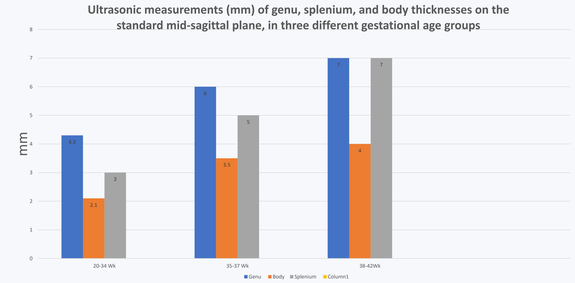
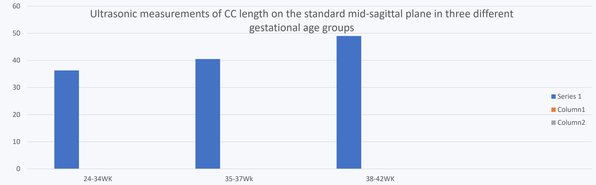
RESULTS

Out of 624 foetuses, the CC was detected in 534 (85.8%) foetuses and has not seen in 90 (14.4%) foetuses with no neurological anomalies. In 497 foetuses, the lengths and thickness of CC were normal and without any detectable neurological anomalies. In 33 cases, the lengths and thickness were below the normal range with different neurological anomalies. On the other hand, in 4 cases the lengths were normal, whereas the thickness was significantly thicker than the normal range with and without anomalies.





CONCLUSION

Partial or complete agenesis of the corpus callosum is a relatively frequent fetal brain anomaly and occurs in at least 0.1% of the general population. Its identification is of clinical interest because corpus callosum anomalies are frequently associated with other structural malformations and chromosomal or genetic diseases. Scanning the foetal head during pregnancy is essential for monitoring corpus callosum development. A thin CC is an ominous sign; indicating neurological anomalies that require further evaluation. While, a thick CC is a rare sign and unlikely to be linked to any neurological pathology.

REFERENCES

1-Moses P, Courchesne E, Stiles J, et al. Regional size reduction in the human corpus callosum following pre- and perinatal brain injury. Cereb Cortex. 2000;10(12): 1200-1210.

2-Mercuri E, Jongmans M, Henderson S, et al. Evaluation of the corpus callosum in clumsy children born prematurely: a functional and morphological study. Neuropediatrics. 1996;27(6):317-322.