

## **Prospective detection and differential diagnosis of cystic posterior fossa anomalies by assessing posterior brain at 11-14 weeks**

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### **Objective**

The purpose of this study was to assess the role of ultrasound scanning in the identification of cystic posterior fossa anomalies at 11-14 weeks gestation.

### **Methods**

A prospective cohort study of fetuses with cystic appearance of the posterior fossa at 11-14 weeks gestation was performed. In all cases and in a control group of 40 normal fetuses, the brainstem-tentorium (BST) angle was also measured. The presence or absence of cystic posterior anomalies was determined at birth or at postmortem evaluation.

### **Results**

In the period 2014-2018, 32 fetuses with an increased brainstem-occipital bone distance and/or failure to visualize the choroid plexus of fourth ventricle (2 brain spaces) were seen. Of these, 18 fetuses were terminated in the first trimester because of associated anomalies and were excluded from the study because of unavailable autoptic findings. The remaining 14 fetuses eventually were found to have a Dandy-Walker malformation in 4 cases, a Blake's pouch cyst in 8 cases, and normal brain anatomy in 2 cases. Two brain spaces were seen in all cases with Dandy-Walker malformation and in 2 of 8 cases with Blake's pouch cyst. Both brainstem-occipital bone measurement and BST angle were significantly different in fetuses with Dandy-Walker malformation, Blake's pouch cyst, and control subjects ( $P < .0001$ ). The brainstem-occipital bone z-scores of fetuses with Dandy-Walker malformation and Blake's pouch cyst were always +3 or more and +1.7 or more, respectively. The BST angle z-scores were always -5 or less and -0.1 or less, respectively.

### **Conclusion**

Our study confirms that sonography of the posterior brain at 11-14 weeks gestation allows the identification of cystic posterior fossa anomalies. A large brainstem-occipital bone distance and a BST angle significantly smaller predicts Dandy-Walker malformation or Blake's pouch cyst. The presence of 2 brain spaces and a small brainstem-tentorium angle are correlated significantly with the presence of Dandy-Walker malformation. In these cases, the superior displacement of the tentorium and the torcular Herophili is easily visible, even subjectively.