# Frontal and occipital horn ratio

Measurement of ventricular size is important in pediatric patients with hydrocephalus, especially those who are being followed with cerebrospinal fluid (CSF) shunts. While volumetric techniques are a more accurate estimate of true ventricular volume, they are often impracticable when multiple modalities including ultrasound are used. Volumetric area and linear measurements were compared to find the most reasonable measurement method.

Sixty-four computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound (US) scans from 25 children aged 0-17 years with hydrocephalus, before and after treatment, were measured. Measurements included ventricular volume, a ventricular/brain ratio, and four standard linear measures (Evans' ratio, Huckman's measurement, minimal lateral ventricular width, and lateral ventricular span at the body). We also included a new ratio, which accounts for often disproportionate occipital horn expansion in pediatric patients, called the frontal and occipital horn ratio. Volume and linear measurements were compared using the Spearman's correlation coefficients and correlations were further differentiated using a Z test statistic. The frontal and occipital horn ratio was also measured on CT, MRI, and US scans from 44 normal children aged 0-17 years to identify normal values. The effect of age was determined by linear regression.

The best linear correlation with ventricular size was the frontal + occipital horn ratio (r = 0.852) and was equivalent to the ventricular/brain ratio (r = 0.891), previously shown to have the highest correlation with ventricular volume. Evans' ratio correlates less well (r = 0.423). The normal frontal and occipital horn ratio is 0.37 and is independent of age.

The frontal and occipital horn ratio is a simple method of evaluating ventricular size in pediatric hydrocephalus patients with CSF shunts [1].

1)
O'Hayon BB, Drake JM, Ossip MG, Tuli S, Clarke M. Frontal and occipital horn ratio: A linear estimate of ventricular size for multiple imaging modalities in pediatric hydrocephalus. Pediatr Neurosurg. 1998 Nov;29(5):245-9. PubMed PMID: 9917541.