High resolution transbulbar sonography in children with suspicion of increased intracranial pressure.

Abstract:
To evaluate the accuracy of high resolution transbulbar sonography for the estimation of intracranial pressure (ICP) in children. In children and adolescents with acute neurologic symptoms of various origin, transbulbar sonography was performed. Besides measurement of the optic nerve sheath diameter (ONSD), the ultrastructure of the subarachnoid space of the optic nerve sheath was evaluated. The results of transbulbar sonography were correlated with clinical data based on cross-sectional imaging, ICP measurement, and ophthalmologic examination. Eighty-one patients (age 3-17.8 years, mean 11.7 years) were included. In 25 children, cross-sectional imaging and ICP measurement revealed increased intracranial pressure. The mean ONSD was 6.85 ± 0.81 mm. Twenty patients (20/25, 80%) had a microcystic appearance of the subarachnoid space of the optic nerve. In 56 children without evidence of increased intracranial pressure, the mean ONSD was 5.77 ± 0.48 mm. Forty-nine patients (49/56, 87.5%) had a normal homogenous appearance of the subarachnoid space. The ONSD in children with increased intracranial pressure was significantly higher than in patients without (p< 0.001). High resolution transbulbar sonography of the optic nerve is a useful technique for the rapid and non-invasive estimation of
intracranial pressure in children. Besides measurement of the optic nerve sheath diameter, evaluation of the ultrastructure of the subarachnoid space of the optic nerve is a helpful parameter.