

OPTIC NERVE SHEATH DIAMETER VARIATIONS IN SUBARACHNOID HEMORRHAGE ADULT PATIENTS

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Purpose:

Optic nerve sheath diameter (ONSD) has been proposed as a non-invasive method to estimate the intracranial pressure (ICP)¹. In this study, we examined whether ONSD properly correlates with invasive ICP measurements in a cohort of patient with aneurysmal subarachnoid hemorrhage (aSAH).

Methods:

Twenty consecutive patients with aSAH and ICP monitoring [median age 54 (49-61), 35% male] were enrolled: the ultrasound (US) examinations of the ONSD was performed in all patients at least twice during 5 (2-9) days, for a total of 81 measurements. To evaluate the accuracy of the US measurement we also measured the ONSD by magnetic resonance imaging (MRI) in ten cases.

Results:

The mean US ONSD diameter was 6.44 ± 0.43 mm and the median ICP was 11 (7-20) mmHg. No correlation was observed between ONSD and ICP ($r = -0.003$). MRI ONSD result of 6.43 ± 0.6 mm, not statistically different from the US ONSD ($p=0.77$). 91 % of ONSD measurements resulted equal or higher than the ONSD cutoff for increased ICP defined by Geerarts² (5.86 mm) but only the 26 % of the enlarged ONSD was found with ICP equal or higher than 20 mmHg.

Conclusions:

Our investigation shows that the ONSD measurement is not a reliable monitoring system for ICP in patients with aSAH. A possible explanation could be that the ICP surge at the aneurysm's rupture modifies the anatomical structure of the ONS causing a prolonged enlargement³. Due to this anatomical deformation, further diameter changes related to ICP increase become undetected.

