## **POSTER PRESENTATION**





# Non-invasive assessment of ICP during infusion test using Transcranial Doppler Ultrasonography

Danilo Cardim<sup>1</sup>, Brenno Cabella<sup>1</sup>, Joseph Donnelly<sup>1</sup>, Chiara Robba<sup>2</sup>, Marek Czosnyka<sup>1</sup>, Matthew Garnett<sup>1</sup>, John D Pickard<sup>1</sup>, Zofia Helena Czosnyka<sup>1\*</sup>

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### Background

Transcranial Doppler (TCD) based methods have been used to estimate ICP noninvasively (nICP), however their relative accuracy varies between different types of intracranial hypertension: vasogenic, CSF circulatory or secondary to brain volumetric changes (oedema, contusion, hematoma, etc). This study aimed to compare four nICP methods in a prospective cohort of hydrocephalus patients whose CSF dynamics was investigated using infusion tests involving controllable test-rise of ICP.

#### Methods

FV, ICP and non-invasive ABP were recorded in 53 patients diagnosed for hydrocephalus. nICP methods were based on: I) interaction between FV and ABP using blackbox model (nICP\_BB); II) diastolic FV (nICP\_FVd); III) critical closing pressure (nICP\_CrCP) and IV) TCD-derived pulsatility index (nICP\_PI). Correlation between rise in ICP ( $\Delta$ ICP) and  $\Delta$ nICP and averaged correlations for changes in time between ICP and nICP during infusion test were investigated.

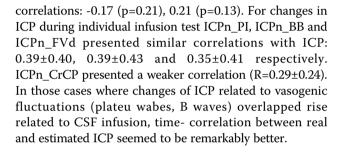
#### Results

All nICP formulas overestimated ICP at baseline (p<0.005): nICP\_BB 10.76 (15.08-7.30); nICP\_FVd 16.97 (22.56-11.64); nICP\_CrCP 18.34 (20.38-14.89); nICP\_PI 16.57 (17.46-16.06). At plateau of ICP during infusion test, only nICP\_BB and nICP\_PI presented significant difference from ICP. From baseline to plateau, all nICPs estimators increased significantly (paired t-test, p<0.05). Correlations between  $\Delta$ ICP and  $\Delta$ nICP were better represented by ICPn\_PI and ICPn\_BB: 0.45 and 0.30 (p<0.05). nICP\_FVd and nICP\_CrCP presented non-significant

\* Correspondence: zc200@medschl.cam.ac.uk

<sup>1</sup>Neurosurgery, University of Cambridge, UK

Full list of author information is available at the end of the article



#### Conclusions

Out of the 4 methods, nICP\_PI was the one with best performance for predicting changes in  $\Delta$ ICP during infusion test, followed by nICP\_BB. nICP\_FVd and nICP\_CrCP showed unreliable correlations. Changes of ICP observed during the test were expressed by nICP values with only a moderate correlations. Vasogenic components of ICP seemed to be easier to estimate with TCD, than component related to increased CSF circulation.

#### Authors' details

<sup>1</sup>Neurosurgery, University of Cambridge, UK. <sup>2</sup>Dept of Anesthesiology, University of Genoa, Italy.

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