

Monitoring of tissue oxymetry and cerebral blood flow for the detection and the treatment of cerebral ischemia in patients after severe subarachnoideal hemorrhage

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Introduction

The aim of the research is to evaluate possible better outcome in the patients after subarachnoideal hemorrhage (SAH) Hunt Hess grade IV – V, endangered with the development of vasospasms followed by several ischemic complications, with the help of tissue oxymetry (PbtO₂) and cerebral blood flow (CBF) measurement.

Methods

We have enrolled 11 patients so far (2011-2012) who suffered from SAH HH grade IV – V., with established aneurysm bleeding source. All the patients were artificially ventilated; aneurysms were treated either with clipping (n=8) or coiling (n=3). The patients have been continually monitored with ICP, PbtO₂ (Licox) and CBF (Hemedex). All values were registered every hour and statistically analysed. All patients underwent daily measurement of TCD for evidence of vasospasm. The treatment result has been assessed with GOS score after three months from SAH.

Learning Objectives

To get a new knowledge about the use of tissue oxymetry and CBF monitoring on sever SAH patients.

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Results

We obtained 998 hours of measurement, the shortest recording takes 92 hours, the longest 230 hours. The monitored parameters oscillated in the following limits (arithmetic average \pm standard deviation): ICP 11,9 \pm 4,8 mmHg, PbtO₂ 26,8 \pm 8,1 mmHg, CBF 20,9 \pm 11,5 ml/100g/min, MABP 98,5 \pm 12,6 mmHg. After statistic evaluation (Pearson correlation coefficient) we found out a strong inversely proportional correlation between ICP and CBF and between ICP and PbtO₂. A good correlation between averaged 6 hour measurement interval of PbtO₂ and corresponding TCD measurement has been disclosed - R = - 0,81. With regards to GOS we reached two patients with good recovery, 2 patients with moderate disability, 5 patients with severe disability and 2 patients died.

Conclusions

In case we confirm the correlation between PbtO₂ and TCD measurement, the PbtO₂ monitoring could be a complementary method for early detection of vasospasms due to its continuous nature.

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