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Non-invasive Intracranial Pressure Monitoring for Severe Traumatic Brain Injury in Children: A Concise Update on Current Methods.

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Introduction

Traumatic brain injury is a leading cause of pediatric morbidity and mortality worldwide and ICP

monitoring plays a crucial role in its management.Based on existing literature,the authors review the current practicing non-invasive ICP monitoring devices and their accuracy in predicting raised ICP in pediatric TBI.

Methods

A thorough literature search was conducted on PubMed,Medline and Cochrane data base,27 articles were

selected systematically,relevant data was summarized.

Results

The ICP targeted therapy results in

better outcome of the patient.TCD can provide significant inputs on early vasospasm detection,cerebrovascular

autoregulation and circulatory arrest in addition to ICP monitoring.The basic principle in using ONSD to detect raised ICP

is its anatomical continuity with duramater and subarachnoid space of the brain.So if there is an increase in the CSF

pressure,the sheath may expand and consequently its diameter increases.Distortion product otoacoustic emission (DPOAE)

is a type of OAE that is often used for the assessment of middle ear function, and has been tested for noninvasive ICP

monitoring.Deep tissue penetration and low absorptivity form the basis of using near infrared spectrum as a noninvasive

technique to monitor ICP fluctuations.Heppner et al. proposed noninvasive contrast enhanced ultra-sonographic

assessment and its use in assessing cerebral perfusion and ICP in patients with severe TBI.In quantitative

pupillometry,asymmetry of pupillary size greater than 0.5mm was observed infrequently in healthy volunteers and was rarely seen in head-injured

Learning Objectives

1. Advancements of non-invasive ICP monitoring methods.

2. Efficacy and safety profile of non-invasive modalities of ICP monitoring in pediatric TBI.

3. Future direction of head trauma critical care in pediatric population.

References

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