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$SjvO_2$monitoring

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Keywords

Cerebral perfusion pressure, intracranial pressure, SjvO2

Comments

Although it appears that $SjvO_2$ monitoring may both complement ICP monitoring in TBI, and be a useful early guide to therapies, it may be of questionable use following initial resuscitation. Like so many of our monitors, it provides information on global organ perfusion but can not exclude local cerebral ischemia. No information is provided on the eventual outcome of these patients and if not improved then the additional expense of this monitoring may not be justified.

Introduction

Following traumatic brain injury (TBI), monitoring and therapy is aimed at preventing secondary cerebral ischemic insults. Intracranial pressure (ICP) monitoring firstly computates cerebral perfusion pressure (CPP), which ideally should be kept above 70 mm Hg, and secondly guides treatment for raised ICP. Jugular bulb venous oxygen saturation ($SjvO_2$) is also able to monitor global sufficiency of cerebral perfusion, although it is unable to identify local cerebral ischemia. However ICP monitoring may not be at hand or contraindicated in the presence of a coagulopathy, and an alternative may be $SjvO_2$, which is easily and rapidly available.

Aims

To prospectively compare $SjvO_2$ and ICP monitoring following traumatic brain injury.

Methods

A total of 30 patients admitted with a Glasgow Coma Score (GCS) < 8 following TBI, were included in the study. ICP and $SjvO_2$ monitoring were established provided the platelet count and prothrombin time were within defined limits. CPP was then raised to 70 mm Hg by raising mean arterial pressure (MAP) with fluids and vasopressors as required. Baseline $SjvO_2$ below 55% was considered as high risk for cerebral ischemic insult.

Results

Three patients were excluded from the statistical analysis since ICP monitoring could not be established because of coagulopathy. MAP was 79 ± 9 mm Hg prior to any intervention. All patients required fluids to raise CPP > 70 mm Hg and 13 patients required vasopressors in addition. Although the majority of patients showed no change or a reduction in ICP following treatment, seven of the patients showed significant increases in ICP (> 5 mm Hg) and two required mannitol to decrease ICP after treatment.ten patients were considered high risk for ischemia with initial $SjvO_2$ < 55%, but all rose to < 55% after treatment. Baseline $SjvO_2$ and CPP measurements showed a significant correlation ($r = 0.73$; $p < 0.0001$), although this disappeared following treatment.

Discussion

Despite perceived adequate MAP prior to introduction of cerebral monitoring, ten patients still had a $SjvO_2$ < 55% at baseline which is associated with a high risk for cerebral ischemia. However following therapy to raise CPP > 70 mm Hg, $SjvO_2$ normalised and may be a useful early and easily performed cerebral monitoring procedure. If early ICP monitoring is impracticable or contraindicated then this study suggests that $SjvO_2$ is an alternative in view of the positive initial correlation. Since ICP may also provide information on the presence or lack of cerebral autoregulation, it would be advisable to implement this monitoring as well at the earliest opportunity. This was particularly relevant since some patients had significant increases in ICP (suggestive of impaired autoregulation) following elevation of CPP, and required treatment to lower the ICP, although at this stage, there was no correlation between ICP and $SjvO_2$.

References

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