

Patients on a ventilator have a high risk of getting pneumonia. One of the ways to help prevent patients from getting pneumonia is to raise the HOB (Head of Bed) to at least a 30-degree angle.

Head-of-bed (HOB) elevation is the standard of care for patients with intracranial pressure monitoring at risk for intracranial hypertension. Measurement of cerebral perfusion pressure (CPP) based on HOB elevation and arterial transducer position has not been adequately studied.

In a planned secondary analysis of prospectively collected data in which paired, serial arterial blood pressure (ABP), intracranial pressure, and CPP measures were obtained once per day for 3 days, with measures leveled at the tragus (Tg) and the phlebostatic axis (PA). The HOB position was recorded for all paired readings.

From 136 subjects, ABP and CPP values were lower when the transducer was leveled at the Tg, compared with the PA (P < .001); these differences persisted regardless of HOB position.

The difference in CPP when ABP is referenced at the Tg versus PA is not consistently attributed to HOB elevation ¹⁾.

Previously, microvascular cerebral blood flow (CBF) response to a mild head-of-bed (HOB) elevation has been shown to be altered in acute ischemic stroke (AIS) by diffuse correlation spectroscopy (DCS).

Gregori-Pla et al., hypothesized that early CBF response is related to the functional outcome.

Patients with a non-lacunar AIS in the anterior circulation were monitored by DCS to measure relative CBF (Δ rCBF) on the frontal lobes bilaterally during a 0°-30° HOB elevation at early (\leq 12) or late (>12) hours from symptom onset. National Institute of Health Stroke Scale (NIHSS) scores were recorded at baseline at 24 and at 48 h. Functional outcome was measured by the modified Rankin Scale (mRS) at 3 months.

Thirty-eight (n = 38) AIS patients [baseline NIHSS = 19 (interquartile range: 16, 21)] were studied. $\Delta rCBF$ decreased similarly in both hemispheres (p = 0.4) when HOB was elevated and was not associated with baseline and follow-up NIHSS scores or patient demographics. At the early phase (n = 17), a lower or paradoxical $\Delta rCBF$ response to HOB elevation was associated with an unfavorable functional outcome (mRS > 2) in the ipsilesional (but not in the contralesional) hemisphere (p = 0.010). $\Delta rCBF$ response in the late acute phase was not related to mRS.

Early CBF response to mild HOB elevation in the ipsilesional hemisphere is related to functional outcome. Further studies may enable optical monitoring at the bedside to individualize management

strategies in the early phase of AIS²⁾.

1)

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