Oxygen reactivity index

The oxygen reactivity index (ORx) has been introduced to assess the status of cerebral autoregulation after traumatic brain injury (TBI) or subarachnoid hemorrhage (SAH). Currently, there is some controversy about whether the ORx depends on the type of PbrO2-sensor technology used for its calculation. To examine if the probe technology does matter, we compared the ORx and the resulting optimal cerebral perfusion pressures (CPPopt) of simultaneously implanted Licox (CC1.SB, Integra Neuroscience, France) and Neurovent-PTO (Raumedic, Germany) probes in patients after aneurysmal SAH or severe TBI.

Licox and Raumedic probes were implanted side by side in 11 patients after TBI or SAH. ORx and CPPopt were recorded continuously. The equivalence of both probes was examined using Bland-Altman analyses.

The mean difference in ORx was 0.1, with Licox producing higher values. The limits of agreement regarding ORx ranged from -0.6 to +0.7. When both probes' ORx values were compared in each patient, no specific pattern in their relationship was seen. The mean difference in CPPopt was 0 mmHg with limits of agreement between -16.5 and +16.4 mmHg.

Owing to the rather limited number of patients, we view the results of this study as preliminary. The main result is that Licox and Raumedic showed consistent differences in ORx and CPPopt. Therefore, ORx values of both probes cannot be interchanged and should not be viewed as equivalent. This should be taken into consideration when discussing ORx data generated by different PbrO2 probe types [1)].

1)
van Santbrink H, Maas AI, Avezaat CJ. Continuous monitoring of partial pressure of brain tissue oxygen in patients with severe head injury. Neurosurgery. 1996 Jan;38(1):21-31. PubMed PMID: 8747947.