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LETTER TO THE EDITOR

Can the interchangeability of somatic oximeters in cardiac surgery inform cerebral applications?

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To the Editor,

The recent study by Ferraris et al. outlining the comparison of 2 near-infrared spectroscopy (NIRS) devices, the EQUANOX™ 7600 (Nonin Medical Inc., Plymouth, MN) and the O3™ (Masimo Corporation, Irvine, CA), in peripheral somatic oximetry in cardiac surgery suggests that the two devices should not be considered interchangeable in routine practice [1]. The opportunity to look at these devices during the relatively uncommon use of intermittent remote ischemic preconditioning [2] is appreciated; however, for the vast majority of the time, NIRS devices are used to obtain real-time information about the adequacy of cerebral perfusion/oxygenation, making it uncertain as to whether these somatic data can be translated to the setting of brain oximetry. It would arguably be more clinically relevant to investigate any between-device comparisons for the application where the devices were initially developed and approved (i.e., brain monitoring). Indeed, there have been several other comparisons of various oximeters that have directly used extracranial (as opposed to remote) ischemic conditions to understand the accuracy of these devices [3, 4].

Although these devices have been used outside of their originally designed parameters when used for the vascular occlusion test to assess microcirculatory responses (that includes conditions similar to those seen with ischemic preconditioning) [5], these devices are principally used to assess the oxygenation status of the brain. This makes the conclusion that "EQUANOX and O3 are not interchangeable in routine practice" somewhat too general a statement to be made without additional studies.

While the enthusiasm of the authors regarding the interest of cerebral oximetry in cardiac surgery is definitely shared, comparisons between different oximeters could probably also be made using appropriately weighted measures of arterial and jugular bulb oxygen saturation [6], or possibly by examining the influences of extracranial contamination [7]. This research could then be followed by larger randomized controlled trials (RCTs) to ensure that placing the sensors of different NIRS devices on extremities produces results similar to placing them on forehead. Only well-designed and larger RCTs, similar to the one by Pisano et al. [3], will allow the determination of whether different NIRS devices are "interchangeable" for cerebral oximetry in cardiac surgery setting.

Author contributions HHK and HPG both contributed to the concept and the writing of this letter.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflicts of interest.

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