

Abstract 3AP4-6

Accuracy of noninvasive hemoglobin measurement by Masimo Radical-7 Pulse CO-Oximeter in adult patients; comparison between revision C and revision K

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Background and Objectives: A novel Pulse CO-Oximetry system (Radical-7® or Rad-87™ combined with R25®, Masimo Co., CA, US) continuously provides hemoglobin measurement as noninvasive hemoglobin concentration (SpHb). R25® sensor is updated constantly to improve its accuracy and the newest revision K is available at present. The in vivo adjustment is also available and provides with the option to adjust patients SpHb bias from the laboratory reference device. We previously reported the accuracy of SpHb improved with in vivo adjustment measured by R25® of revision C [1]. We compared the accuracy of SpHb between revision C and K. We also analyzed the effect of in vivo adjustment on SpHb measured by revision K.

Materials and methods: After IRB approval, 11 adult patients scheduled for open abdominal surgery with ASA physical status 1-2 were enrolled. Two R25® sensors of revision K were attached to the index and middle finger contralateral to the radial arterial line. Each sensor was compared to Radical-7® and Rad-87™. General anesthesia was induced and maintained by our standardized protocol. A blood gas sample was drawn for in vivo adjustment just before the skin incision and SpHb bias was adjusted. The other samples were collected during the surgical procedure as the anesthetist needed. The total hemoglobin provided by blood samples (tHb) and the simultaneous SpHb by Radical-7® and Rad-87™ were recorded. We also used the data from our former report and compared between revision C and K.

Results and discussion: 52 pairs of data were collected. Bland-Altman analysis showed the 95% limits of agreement (LOA) to be -0.8 g/dl, with a bias of -0.48 g/dl for the difference between SpHb and tHb without in vivo adjustment. The result obtained from our former report of revision C showed 95% LOA to be -2.82 to 3.14 g/dl, with a bias of 0.16 g/dl [1]. The accuracy of revision K improved compared with revision C. In vivo adjustment did not improve the accuracy of SpHb in revision K however. Revision K is enough accurate without in vivo adjustment. It is reported to have relatively poor correlation in a dynamic situation such as massive bleeding, in which in vivo adjustment may have its effect. This is to be investigated further.

Conclusion: The sensor of revision K improved the accuracy of SpHb. SpHb measured by revision K is reliable without in vivo adjustment in relatively stable cases.

Reference:

[1] Isosu T, et al. J Clin Monit Comput 2013; 27: 55-60

Assigned speakers:

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Assigned in sessions:

02.06.2014, 10:30-12:00, Abstract Presentation Session, 03AP4, Monitoring O2 transport, Poster Area - Row 2B