Systematic review and meta-analysis of method comparison studies of Masimo pulse co-oximeters (Radical-7™ or Pronto-7™) and HemoCue® absorption spectrometers (B-Hemoglobin or 201+) with laboratory haemoglobin estimation.


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We assessed agreement in haemoglobin measurement between Masimo pulse co-oximeters (Rad-7™ and Pronto-7™) and HemoCue® photometers (201+ or B-Hemoglobin) with laboratory-based determination and identified 39 relevant studies (2915 patients in Masimo group and 3084 patients in HemoCue group). In the Masimo group, the overall mean difference was -0.03 g/dl (95% prediction interval -0.30 to 0.23) and 95% limits of agreement -3.0 to 2.9 g/dl compared to -0.08 g/dl (95% prediction interval -0.04 to 0.20) and 95% limits of agreement -1.3 to 1.4 g/dl in the HemoCue group. Only B-Hemoglobin exhibited bias (0.53, 95% prediction interval 0.27 to 0.78). The overall standard deviation of difference was larger (1.42 g/dl versus 0.64 g/dl) for Masimo pulse co-oximeters compared to HemoCue photometers. Masimo devices and HemoCue 201+ both provide an unbiased, pooled estimate of laboratory haemoglobin. However, Masimo devices have lower precision and wider 95% limits of agreement than HemoCue devices. Clinicians should carefully consider these limits of agreement before basing transfusion or other clinical decisions on these point-of-care measurements alone.