Comparison of Two New Generation Pulse Oximeters with Arterial Oxygen Saturation in Critically Ill Children: Authors' Reply

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To the Editor : We thank the authors for the interest in our research article [1] and for highlighting important aspects of the Bland Altman analysis. We agree that correlation is a poor surrogate for agreement; in our analysis we have used measure of agreement only.

Air bubbles can affect the blood gas analysis and we took precautions to avoid presence of air bubbles in the sample. We used the minimum volume of blood as recommended by the manufacturer for a reliable analysis; only 0.2 ml is used in the analysis; 1 ml collection every time will lead to unnecessary wastage of sample in children, particularly infants.

We agree with the fact that analyzing samples in duplicate may have increased the precision but repeating 183 samples would not have been economically feasible and that is not a routine practice. The coefficient of variation of the arterial blood gas (ABG) analyzer for every parameter is not mentioned. The manufacturer has mentioned a “measuring range” for various ABG parameters within which the accuracy and precision of the measured parameter is guaranteed. None of the values in any of the patients were outside this ‘measuring range’.

The limits of agreement observed in the study were quite wide implying the poor agreement between the SO_2 and

Table 1 Mean difference and limits of agreement for oxygen saturation values obtained by pulse oximetry and arterial blood gas analyses

	Enhanced SET pulse oximeter		Conventional pulse oximeter	
	Mean difference between SpO_2 and SO_2 (95% CI)	Limits of agreement	Mean difference between SpO_2 and SO_2 (95% CI)	Limits of agreement
$SO_2 > 95\%$ ($n=113$)	0.8 (−0.11 to 1.72)	−9.0 to 10.6	−0.8 (−1.27 to −0.33)	−5.9 to 4.3
SO_2 90–95% ($n=44$)	4.03 (3.13 to 4.94)	−1.8 to 9.92	1.45 (0.15 to 2.76)	−7.02 to 9.9
$SO_2 < 90\%$ ($n=27$)	9.37 (7.08 to 11.65)	−2.2 to 20.9	4.9 (3.12 to 6.72)	−4.18 to 14.03

SET Signal extraction technology

SpO_2 . We have now provided the differences and limits of agreement for SO_2 values in different ranges (Table 1); this shows that the difference between SpO_2 and SO_2 is higher with lower SO_2 values.

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Reference

1. Jose B, Lodha R, Kabra SK. Comparison of two new generation pulse oximeters with arterial oxygen saturation in critically ill children. Indian J Pediatr. 2014;81:1297–301.