

Comparison of Tinké (Lightning) to Masimo (Rad-5) Pulse Oximeter at normal SpO2 levels

Sensorium, Jan 2014

OBJECTIVE

To assess the agreement of Tinké (Lightning) to Masimo pulse oximeter (Rad-5) at normal SpO2.

METHODS

30 adult subjects were involved in the study and tested in normal resting state on 4 Tinké devices in a room with 4 Fluorescent lights. During the tests, the subject's left index finger was connected to Masimo's Rad-5 and right index finger/thumb (without finger cover) rested on Tinké.

For Tinké to provide SpO2 readings, an estimated 30 seconds of data collection is required as compared to the 5 seconds recording via Masimo's Rad-5. For comparison purpose, the average of the 5 seconds recordings from Masimo's Rad-5 was used as the benchmark against Tinké. The tests were first conducted under 4 Fluorescent LIGHTS ON conditions followed by the LIGHTS OFF conditions. In LIGHTS-ON condition, the light intensity in the room was monitored with a lux meter. Agreement of Tinké SpO2 to Masimo SpO2 was tested using the Bland-Altman plot based on the data recorded in LIGHTS-OFF and LIGHTS-ON condition separately, and based on all data including both conditions as well.

RESULTS

Figs. 1a and 1b show the Bland-Altman plots for Tinké SoO2 as compared to Masimo SpO2 readings in LIGHTS-OFF and LIGHTS-ON conditions. In both LIGHTS-OFF and LIGHTS-ON (light intensity from lux meter: 534 ± 16.14 lx) conditions, Tinké showed good agreement to Masimo.

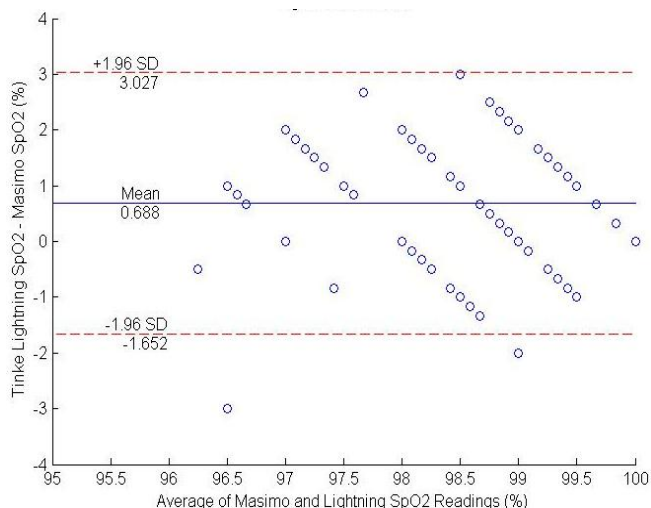


Fig. 1a The Bland-Altman plot for Tinké SpO2 compared to Masimo SpO2 in LIGHTS-OFF conditions

Under the LIGHTS-OFF condition (see Fig. 1a), 95% limits of agreement is 4.679, which is comparable to the 4.1 for Masimo iSpO2 as reported by McCoy et al. (2013). In LIGHTS-ON condition (see Fig. 1b), Tinké showed slightly decreased agreement with a slightly wider 95% limits of agreement, which is 5.124.

This is due to the fact that during the measurements, for Tinké, there was no additional accessory like finger cover or finger clip as for Masimo and thus there could be the interferences from ambient light in LIGHTS-ON condition.

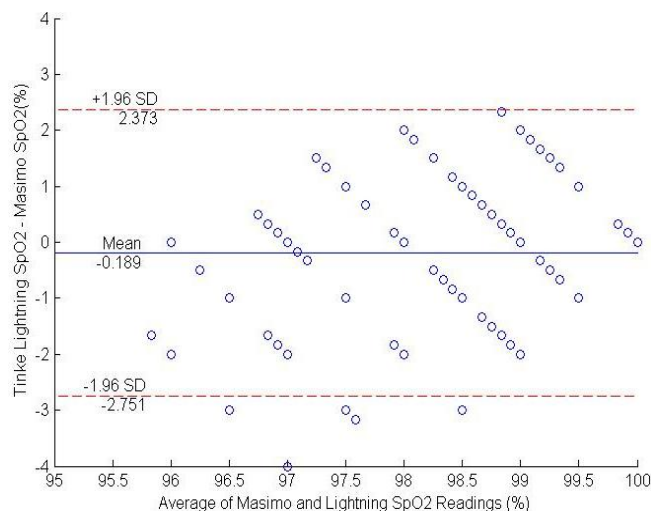


Fig. 1b The Bland-Altman plot for Tinké SpO2 compared to Masimo SpO2 in LIGHTS-ON conditions

Combining all the SpO2 measurements from both LIGHTS-OFF and LIGHTS-ON conditions, 95% limits of agreement for Tinké as compared to Masimo was 5.190 (see Fig. 2).

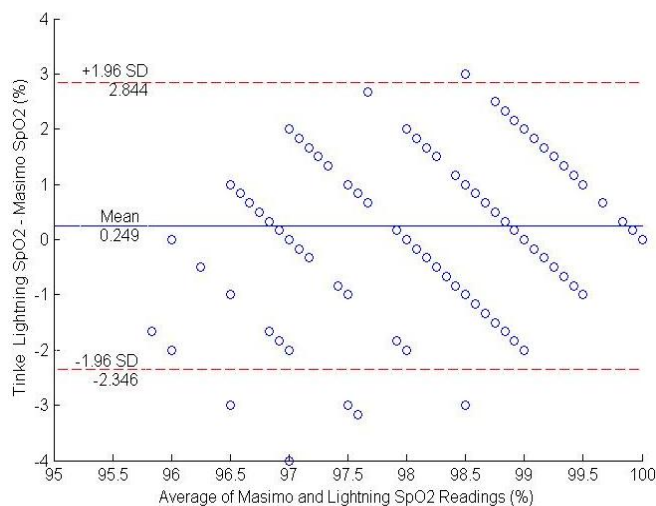


Fig. 2 The Bland-Altman plot for agreement between Tinké and Masimo on normal SpO2 under both LIGHTS-OFF and LIGHT-ON conditions

CONCLUSION

Tinké (Lightning) showed good agreement to Masimo (Rad-5) at normal SpO2 in both LIGHTS ON and LIGHTS OFF conditions. Under LIGHTS-OFF condition, the agreement of Tinké to Masimo is comparable to that of iSpO2 to Masimo (Rad-5). The good agreement of Tinké to Masimo in LIGHTS-ON condition demonstrates Tinké advantage of being tolerant to ambient light without a finger clip, enabling a design moving away from traditional pulse oximeter architecture.