Comparison of ipad/iphone Spo2 Devices to a Traditional Pulse Oximeter.

McCoy K., Limron K., Light A.E., Pursley D. *Respiratory Care* 2013; 58(10):1781.

Introduction

Recently, two commercially available iPhone/iPad pulse oximeter applications came on the market, the Tinke (Zensorium, Synapse, Singapore) and the Masimo iSpO2 (Masimo Corp., Irvine, CA). We set out to compare the two devices to the Masimo Radical 7 (Rad7) to assess the agreement of the new devices to the traditional device.

Methods

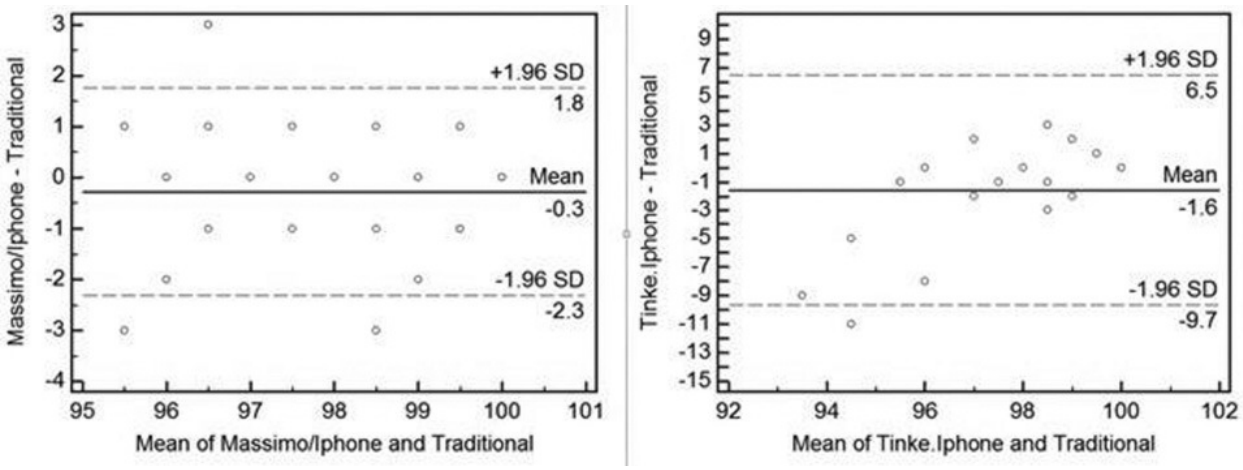
After obtaining IRB approval, we recruited 55 adult subjects from the community at a local college event and on campus. The subject's left hand was placed on the Rad7 and their right hand was placed on either the Tinke or the iSpO2. The readings were timed to determine how long it took to achieve a reading and the SpO2 was recorded. The left was then changed to the other commercially available device, that device was timed and the SpO2 reading recorded. A Bland-Altman plot was produced by MedCalc statistical software to test for agreement. A t-test was performed to determine if the difference in the average time to achieve a reading of the SpO2 was different between the two commercially available pulse oximeters.

Results

The Bland-Altman plots show that the iSpO2 device had better agreement with the Rad7 than the Tinke. However, the Tinke's agreement did improve at the higher SpO2 readings. Although, still wider than the iSpO2. The Bland-Altman plot for the Tinke appears to demonstrate a linear drop in agreement as the SpO2 reading decreases on subjects. Additionally, the Tinke only provided a SpO2 reading 45% of the time, despite repeated attempts. Conversely, the iSpO2 reported a SpO2 every time. The average time to report a SpO2 reading was 20.09 seconds (8.11 Stdev) with the iSpO2 and 59.40 seconds (25.75 Stdev) with the Tinke. The difference in time was statistically significant ($p<0.05$).

Conclusion

Our findings demonstrate that Masimo iSpO2 had better agreement to the traditional pulse oximeter than the Tinke. Additionally, the Tinke took longer to report a SpO2 reading and did not report a result as often as the iSpO2. The lack of reported values from the Tinke was investigated and found to be closely related to when the device was utilized in an outdoor environment. The Massimo iSpO2 appears to be interchangeable with the traditional pulse oximeter in healthy patients. However, further studies need to be performed on non-healthy patients to determine the agreement of this new device.


Massimo/Iphone - Traditional
Mean of Massimo/Iphone and Traditional
+1.96 SD
1.8
Mean
-0.3
-1.96 SD
-2.3
Tinke.Iphone - Traditional
Mean of Tinke.Iphone and Traditional
+1.96 SD
6.5
Mean
-1.6
-1.96 SD
-9.7