Accuracy of Non-invasive Hemoglobin Measurement through a Pulse CO-Oximeter Compare to Venous Blood Draw in a Community Setting.

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Introduction

Measurement of Hemoglobin is a routine and essential Clinical tool for knowing anemic status of patients. With the help of a non-invasive method of Hemoglobin Measurement we could avoid puncture of vessels, blood exposure and processing time to get the results. In addition, non-invasive method does not require much processing time, so we could get the results much faster than the invasive method.

Methods

After IBR approval and informed written consent, 127 adult patients were recruited from two Health Fairs in the general community in the study. Four non-invasive Hemoglobin devices (Pronto 7® with Rev F SpHb Sensor, Masimo, Irvine, CA) were used. The SpHb sensor consisted of a reusable optical probe connected to the Pronto 7® hand-held device. These sensors were placed on the subjects four fingers (middle and ring fingers of both hands), covered with light shielding bags, and measurements were recorded by the devices. A venous blood sample was collected and analyzed on a laboratory reference device (Beckman Coulter LH500®). The mean bias, precision, and upper and lower limits of agreement for SpHb compared to laboratory hemoglobin were calculated.

Results

A total of 325 measurements recorded and analyzed with a Hemoglobin range of 9.0-17.1 g/dl. It was compared to values obtained from laboratory analysis of Hemoglobin, which had a range of 10.55-17.35 g/dl. The Bias, Precision & Accuracy were -0.0646, 1.0680 & 1.0683 respectively.

Conclusion

Non-invasive hemoglobin measurement with the Masimo Pronto 7® hand-held device gives immediate result. When compared to a laboratory reference device, the Pronto-7 provides similar values and offers acceptable accuracy. The Pronto-7 has the potential to be very helpful in "spot checking" for anemia in the general community without the need for an exhaustive set-up or processing time.
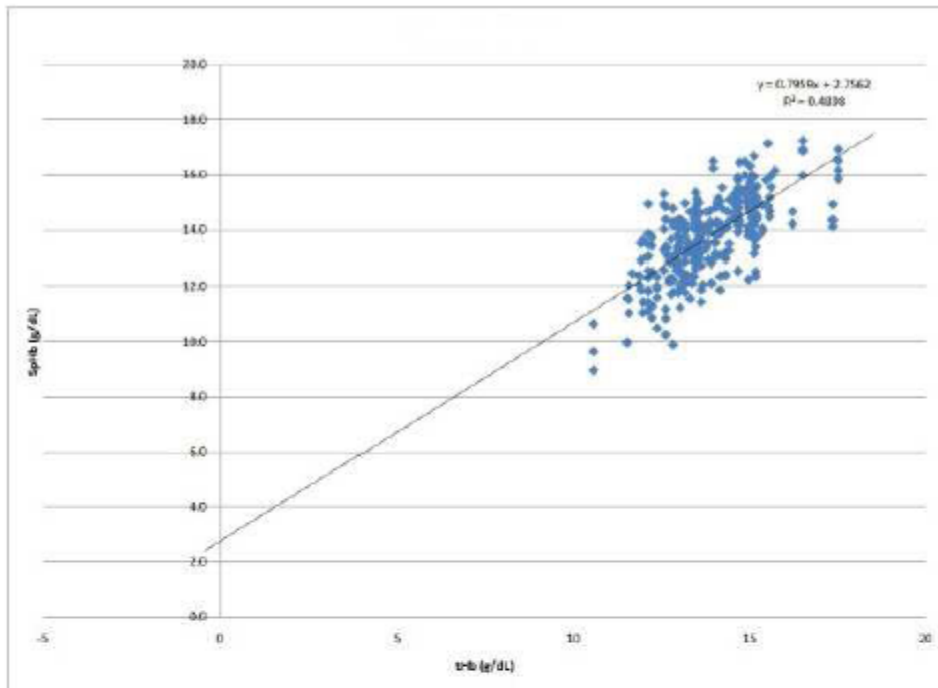
Figure 2