
Comparative evaluation of Diaspect Tm hemoglobin analyzer and ABL 90 flex blood gas analyzer

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Background

The use of dedicated Point-of-Care (POC) devices for hemoglobin testing is common practice, especially in blood donation settings and anemia screening programs.

In critical care units, operating theatres and emergency rooms the method predominately used for on-site hemoglobin measurement is the blood gas analyzer.

Considering their portability, speed of measurement, low maintenance requirements and low cost per test, POC hemoglobin analyzer can be an interesting alternative in situations where hemoglobin is the main parameter of interest.

The purpose of this evaluation was to compare the analytical performance of the Diaspect Tm POC hemoglobin analyzer with a common blood gas analyzer.

Materials and Methods

A total of 16 heparinized venous samples were collected from healthy subjects and tested for hemoglobin and hematocrit (Hct) levels.

Aliquots from five samples were used to prepare 13 concentrated and 10 diluted specimens by centrifugation and either removal (to concentrate samples) or addition of plasma (to dilute samples). A total of 44 specimens were analyzed. All samples were analyzed within 5 hours after collection.

Parallel analysis of total hemoglobin was performed on ABL 90 flex (Radiometer Medical), a blood gas analyzer specifically designed for demanding hospital wards like ICU, NICU and ED and Diaspect Tm, a compact POC hemoglobin analyzer.

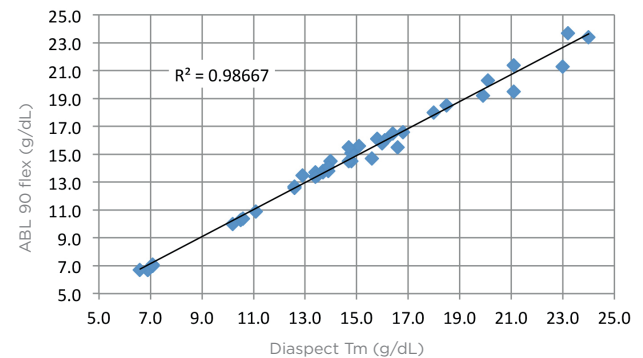
Diaspect Tm uses an innovative reagent-less technology based on broad-spectrum photometry with a very short measurement time of just about one second.

Results

Hemoglobin results for the Diaspect Tm Analyzer compared with those of the ABL 90 flex are shown in the figures on the right.

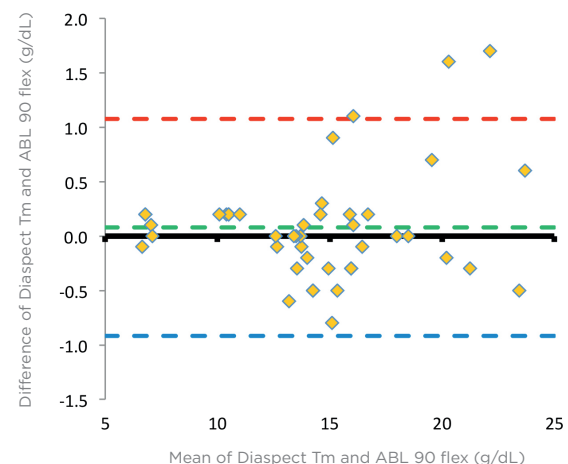
Diaspect Tm hemoglobin results were highly correlated ($R^2 > 0.98$) over the entire measurement range with a greater correlation ($R^2 > 0.99$) for values < 13 g/dL.

Correlation of hemoglobin results



A Bland-Altman plot shows a negligible BIAS and an excellent agreement of both methods, especially in the clinically most relevant range < 13 g/dL.

Bland-Altman plot of hemoglobin results



Conclusions

The Diaspect Tm analyzer enables rapid, on-site hemoglobin measurements in whole blood samples which are in good agreement with the commonly used blood gas analyzer.

The Diaspect Tm analyzer is easy to operate and can be handled by routine clinical staff.

The availability of a rapid, simple and reliable hemoglobin test should facilitate the management of patients at risk of anemia in various Point-of-Care settings.

