A Point of Care FBC and Whole Blood CRP Comparison Study

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Synergy Health Laboratory Services has over 20 years experience in the provision of fully accredited analytical services to all industry sectors.

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Aims

The aim of the study was to establish if the FBC and whole blood CRP results obtained for Horiba Medical's Microsemi correlated with those results from the depts routine analysers, the Pentra 120 (Horiba Medical) and the Cobas 6000 (Roche Diagnostics).

Introduction

CRP is secreted by the liver in response to a variety of inflammatory cytokines but predominantly IL-6. Levels of CRP increase very rapidly (peaking at 48 hrs) in response to trauma, inflammation and infection, and decrease with the resolution of the condition[1].

The plasma half-life of CRP is approximately 19 hours and has been seen to be constant under all conditions of health and disease, therefore the major driver of CRP concentrations is its rate of synthesis, which is directly related to the intensity of the pathological process.

CRP, although a non-specific marker, is often used for the diagnosis and monitoring of different acute inflammatory processes[2], it is particularly good when combined with other clinical and pathological data such as the WBC, it has been shown to be especially useful in reducing antibiotic usage when available in the near patient setting[3].

CRP and WBC has also been shown to be independent risk factors for those of increased risk of heart failure[4].

Methods

The Microsemi CRP (HORIBA Medical) takes 4 minutes and required only 18 µL of whole blood to produce a 3 part FBC differential and a whole blood CRP. Which makes it suitable for paediatric use.

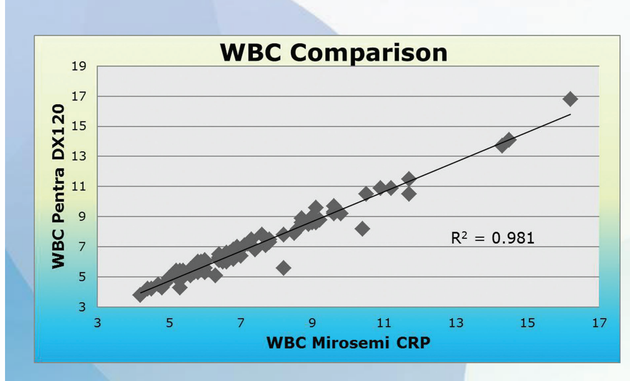
This study used 86 matched EDTA whole blood and SST serum samples (Becton Dickenson) which were initially processed on the ABX Pentra 120 (HORIBA Medical), while the SST serum samples were tested for CRP on the Cobas 6000 platform (Roche Diagnostics).

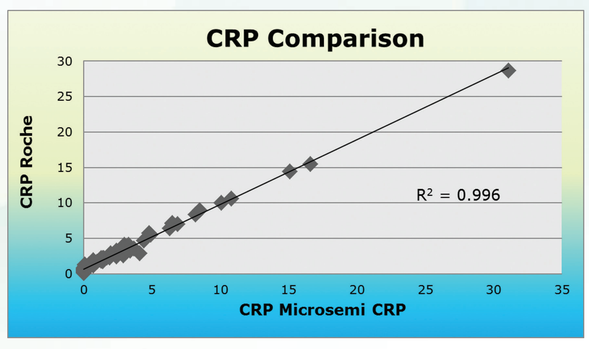
Repeatability tests were conducted over 5 days using the manufacturers controls (Normal) while patient testing was done on both sets of analysers within 4 hours of each other over the same period.

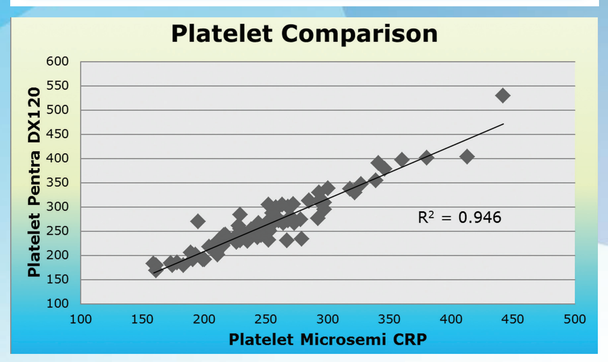
Results

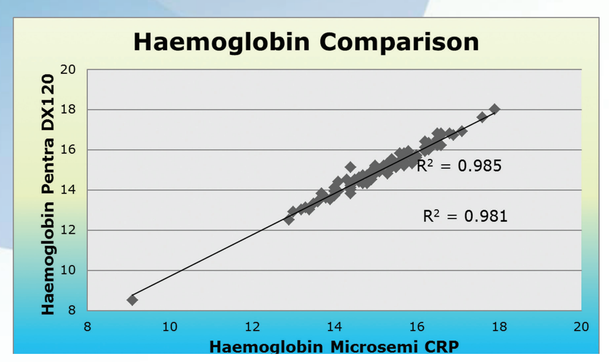
The instrument demonstrated excellent correlation for FBC, differential and CRP when compared to routine methods with the exception of the monocytes. This could be explained by the low numbers involved (0.2-1.2 x 109 /L). The CRP correlation was exceptional at 0.996

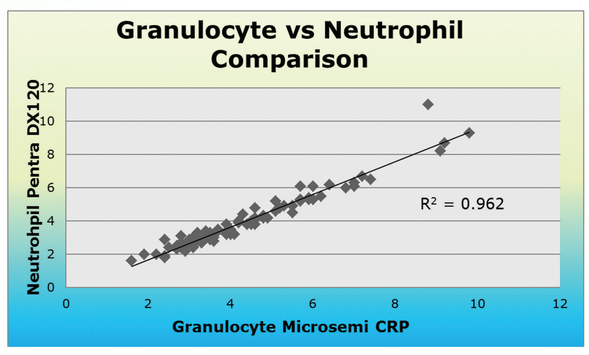
Parameter	Correlation
WBC	0.9814
RBC	0.9662
Hb	0.9850
Hct	0.9448
Platelets	0.9460
CRP	0.9962
Neutrophil/granulocytes	0.8656
Monocytes	0.3369
Lymphocytes	0.9698











Conclusion

The Microsemi CRP is the latest generation of the Micros CRP family that can rapidly and reliably measure 3-differential WBC and CRP. It uses 18 µL of whole blood providing a FBC and CRP in only 4 minutes. It has a wide detection range for CRP, going from 0 to 200 mg/L in whole blood samples and up to 150 mg/L in plasma samples. The 3 part WBC diff has shown good correlation to the ABX Pentra 120 and in a previous poster the Micros granulocyte result was shown to accurately correspond to the Neutrophil count from the ABX Pentra platform.

The three level whole blood control integrates the CRP avoiding the need of two separate controls. Previous studies found no carry over and confirmed the manufacturer's specifications[5].

This comparison again showed good comparison data between Horiba Medical platforms (Microsemi CRP v Pentra 120) and in this poster between the Microsemi and the Roche Cobas 6000 CRP assay, adding further weight to a valuable role in both the Primary Care and Secondary Care settings where its use could reduce antibiotic usage[3], provide accurate and rapid results in the paediatric setting[6] and improving the rapid detection of increased risk of major co-morbidities in COPD patients[7].

References

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