Mercodia

Technical Note, No: 34-0138, v.3.0

Choosing sample type when measuring MPO

An important consideration in pre-analytical handling conditions is the prevention of artificial release of MPO from neutrophils in the samples, which may lead to falsely increased results. This technical note describes results generated to show the difference in sample types when analyzed in the Mercodia MPO ELISA.

Sample pre-handling to avoid neutrophil release of MPO is especially important as MPO has shown potential as a marker for cardiovascular disease. Reports have linked increased concentrations of circulating MPO with increased risk for coronary disease, increased risk in patients with acute coronary syndrome and clinical utility in identification and prognosis of heart failure patients[2].

Method

For comparison, 40 matched sets of samples of EDTA-plasma, heparin-plasma, citrate-plasma and serum from apparently healthy blood donors, male and female in the ages 19-64 were analyzed in the Mercodia MPO ELISA, 10-1176-01. The results are shown in table 1 and figure 1

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Table 1: Mean, max and min measured concentration in µg/L of 40 matched sets of samples with different sample types, EDTA-plasma, heparin-plasma, citrate-plasma and serum, analyzed in Mercodia MPO ELISA.

	EDTA-plasma	Heparin-plasma	Citrate-plasma	Serum
Mean (µg/L)	80	135	70	186
Max (µg/L)	146	307	131	346
Min (µg/L)	43	61	37	80

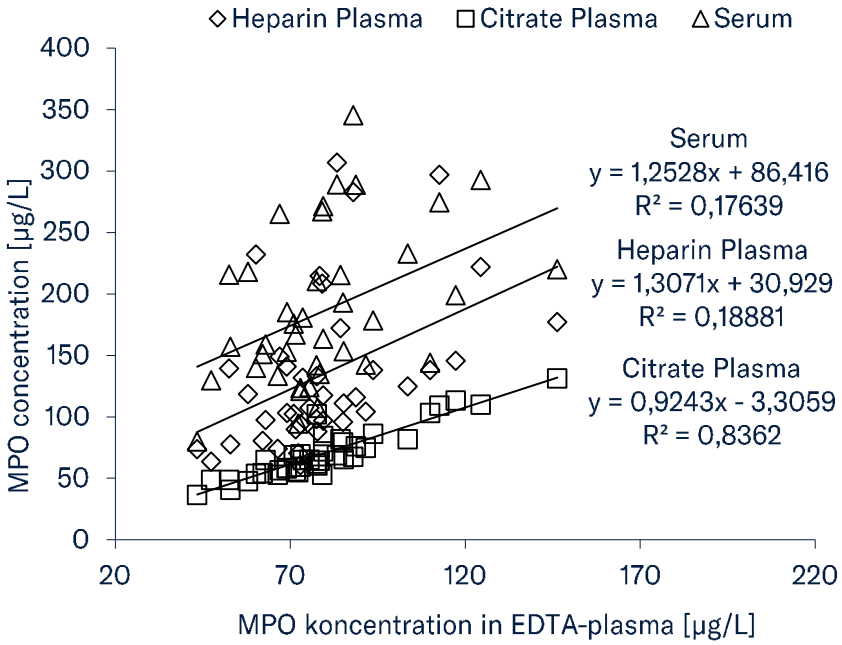

Figure 1: Scatter plots of MPO concentrations measured in EDTA-plasma versus concentration measured in serum, heparin-plasma and citrate-plasma.

Results

The results of the study show that there is an increased level of MPO in both serum and heparin-plasma compared to EDTA-plasma. The highest values were obtained with serum samples. The correlation is also low between serum and EDTA-plasma and between heparin-plasma and EDTA-plasma. This is in agreement with published results from Sheffer PG *et al.* (2009)

Citrate plasma shows a relatively good correlation to EDTA-plasma in this study. It has however been shown by Shih *et al.* (2008) that citrate plasma also can give increased MPO values if kept at room temperature before centrifugation and separation of the plasma fraction.

Higher MPO concentrations in heparin-plasma, citrate-plasma and serum can be explained by in vitro release of MPO from neutrophils, and that the increase is time dependent in room temperature after collection[1,2].

Conclusion

EDTA-plasma is recommended for MPO measurement because values are not confounded by poorly controlled ex vivo release of MPO from neutrophils and can therefore more accurately reflect the concentration of MPO in circulation[1].

Serum, heparin-plasma and citrate-plasma may be used in the Mercodia MPO ELISA. Serum or the presence of heparin or citrate anticoagulant will not affect the measurement of the analyte itself. However, when evaluating the results possible effects from preanalytical handling must be considered.

References

1. Scheffer PG. *et al.* (2009) Myleoperoxidase concentrations in EDTA-plasma of healthy subjects are discordant with concentration in heparin-plasma and serum. *Clin Biochem* 42:149-1492
2. Shih J. *et al.* (2008) Effect of Collection Tube Type and Preanalytical Handling on Myleoperoxidase Concentrations. *Clin Chem* 54:6 1076-1079