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Studying the associations between myeloperoxidase levels in neutrophils and mean cell haemoglobin concentration in varying haemoglobin concentrations of patients attending haematology clinic, Colombo North teaching hospital, Ragama, Sri Lanka

M. U. A. Peiris^{*1}, P. W. W. M. S. D. Wickramasinghe¹, R. Tudugala.², Y. Costa³ and D. U. Kottahachchi¹

¹Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences. Sir John Kotelawala Defence University, Rathmalana, Sri Lanka

²Department of Radiography and Radiotherapy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Rathmalana, Sri Lanka

³Department of Haematology, Colombo North Teaching Hospital, Ragama, Sri Lanka
unethryakarsha@gmail.com*

Myeloperoxidase (MPO), a heme-containing peroxidase mostly found in the lysosomal azurophilic granules in neutrophils. Since the MPO directly associates with the neutrophil phagocytic system, diseases that associate with bacterial infection or inflammation may directly link with its levels in neutrophils. Since serum iron levels regulate the levels of MPO in neutrophils, it may directly or indirectly be correlated with the plasma hemoglobin (HB) and intra-red cell HB concentration; MCHC, especially in anemic conditions. In such a situation, finding associations between MCHC, HB with MPO would facilitate MPO to be used as a new diagnostic tool for anemia. Present study was focused on understanding the correlations between MPO in peripheral blood neutrophils and Mean Cell Hemoglobin Concentration (MCHC) in varying hemoglobin concentrations. Total of 180 patients with varying hemoglobin concentrations who attended Haematology Clinic at Colombo North Teaching Hospital, Ragama, Sri Lanka were selected and peripheral blood smears of them were stained and quantified according to Mahjoub et al. (2015) with a few modifications. Mean Cell Hemoglobin Concentration (MCHC) was measured using a Hematology analyzer (Mindray BC-6800). Results were further categorized according to the subgroups of HB; Group1: 8.0 g/dL<HB; Group2: 8.0 g/dL=<HB<10.0 g/dL, Group3: 10.0 g/dL=<HB<12.0 g/dL, Group4: Hb>= 12.0 g/dL. The statistical analysis was performed using IBM SPSS_V26. First, the data was tested for normalization, followed by the Mann-Whitney Test. The total study population was 180 that included females (70%) and males (30%). The mean values of HB, Total MPO score, MCHC are 9.77 ±3.21, 50.85±30.29, 32.98±3.59 g/dL respectively. None of the parameters followed a normal distribution. In the Spearman's correlation bivariate analysis, the MCHC showed significant weak negative correlation (p=0.025; r=.167) with the MPO. However, there was no reliable correlation between MPO and HB. MPO did not show any significant differences between HB subgroups. However, MPO and MCHC separately showed a significant (p<0.01) increase in their mean difference among all the HB subgroups. Our results revealed that the MCHC possesses a moderate to weak correlation with MPO in neutrophils. Further, the MPO did not provide reliable correlations with HB in the whole group or in subgroups. However, MCHC values tend to decrease with the increasing levels of MPO in the mild anemic group (10.0 g/dL=<HB<12.0g/dL). The initial results provoked to study the behavior of MCHC and MPO in neutrophils in varying HB concentrations. By performing future research with a larger sample size, the initial findings could be validated.

Key Words: Iron deficiency, Iron deficiency anemia, Haemoglobin, Myeloperoxidase, Mean Cell hemoglobin concentration.