DETERMINATION OF CHANGES IN RBC PARAMETERS OF MRI SAMPLES STORED AT ROOM TEMPERATURE

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Thalassaemia is the most common inherited genetic haemoglobin disorder in the world. The prevalence of β-Thalassaemia carrier state in Sri Lanka is estimated at 2-4%. Department of Haematology at the Medical Research Institute (MRI) serves as a national thalassaemia screening centre under the "National thalassaemia prevention programme" conducted by the Ministry of Health. Full Blood Count (FBC) is done as the first step in thalassaemia screening of fresh EDTA specimens. The samples with low haemoglobin (Hb) or low red cell indices (MCV<80fl/ MCH<27pg) are subjected to the HPLC (High Performance Liquid Chromatography) test which is performed as the confirmatory test. Blood specimens are frequently delivered to the Department of Haematology at MRI after a significant post collection interval at room temperature (RT). As the diagnostic procedure completely relies on laboratory test parameters of RBC and HPLC, precise and accurate test results are very important for correct interpretation.

The objective of the study is to see clinically significant changes in RBC parameters in the FBC test during 24 hrs when samples are kept at RT.

A Sysmex XN-1000 fully automated FBC analyzer was used to perform FBC on specimens. In this study 2 cc EDTA (K_2EDTA) blood was collected from ten volunteer participants. The first FBC testing on the ten samples was done within 10 min of bleeding, and subsequent three testing cycles were done during 24 hrs on samples kept in RT (22 °C). For each FBC estimate, five (05) repetitive tests were done initially and mean values were considered to be the target value for each parameter. Deviations from the target value for each test parameter through 24 hrs were calculated. CV (coefficient variant) for each parameter within the runs and between runs for 24 hrs was calculated.

Clinically acceptable best performance laboratory CV range for parameters of RBC, Hb, MCV and MCH are 2%, 1.5%, 2% and 1.2% respectively. CV values of RBC, Hb, MCV and MCH for each sample in scheduled time interval and overall values did not exceed more than the values mentioned above. Mean RBC, Hb, MCV and MCH values of each sample in each interval fluctuated within (+/- 4%) of the initial mean value of its parameter. This study reveals that the mean values of each sample of RBC, Hb, MCV and MCH during the study period fluctuated within the clinically acceptable limit of the target value. This study indicates that the accuracy and the precision are within the accepted limits. Thalassaemia screening parameters in FBC tests done on Sysmex XN-1000

analyzer could be taken as clinically reliable for 24hrs on samples stored at RT. However, the present study that was done with a small number of samples and needs to be further expanded with a large number of samples.

Keywords: RBC parameters, room temperature, Sysmex XN-1000 analyzer, time (24 hrs)

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