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EFFECT OF EXCESSIVE CONCENTRATION OF ANTICOAGULANT DIPOTASSIUM ETHYLENE DIAMINE TETRAACETIC ACID ON COMPLETE BLOOD COUNT

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The Complete Blood Count (CBC) is a laboratory test routinely carried out as one of the first steps in diagnosis. Proper specimen collection is the first step in ensuring accurate and reliable results from a clinical laboratory. Incorrect procedures in mixing blood with the anticoagulant EDTA result in incorrect blood: anticoagulant ratio. This study analyzed the effect of excessive amount of dipotassiumethylenediaminetetraacetic acid (K_2EDTA) anticoagulant on CBC. This was a descriptive cross-sectional study, using 100 healthy volunteers. A total volume of 4 mL of blood was drawn from each subject. Different volumes of blood, *i.e*. 2.0 mL, 1.0 mL and 0.5 mL, were dispensed into separate blood collection tubes containing 3 mg of K_2EDTA in each tube. Tube containing 2 mL of blood in 3 mg anticoagulant was considered as standard. Then CBC test was carried out for 300 blood samples using Haematology Analyzer within 4 hours. Statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS). The tested CBC parameters of the tubes containing 0.5 mL and 1.0 mL blood volumes showed significant difference ($p < 0.05$) compared to the CBC parameters of the standard blood sample. Some parameters were significantly increased and some were significantly decreased compared to the standard sample. Decreased parameters were Total White Blood Cell (WBC), percentage of Eosinophil, Monocyte, Haemoglobin concentration, Total Red Blood Cell (RBC), Haematocrit (HCT), Mean Corpuscular Haemoglobin (MCH), Mean Corpuscular Haemoglobin Concentration (MCHC), Platelet, and Plateletcrit (PCT) while the increased parameter was Mean Corpuscular Volume (MCV). However, percentage of Lymphocytes, Neutrophils, Basophils, Red Cell Disrtibution Width-Coefficient Variation (RDW-CV), Red Cell Distribution Width-Standard Deviation (RDW-SD), and Platelet Distribution Width (PDW) showed no significant variance of the CBC parameters. It is preferable to perform total WBC, Haemoglobin, total RBC, HCT, MCV, MCH, MCHC, Platelet, PCT, percentage of Eosinophil and Monocyte on blood specimen with correct blood volume and anticoagulant (1.5 ± 0.25 mg of K_2EDTA/mL of blood). When analyzing Percentage of Lymphocytes, Neutrophils, Basophils, RDW-CV, RDW-SD and PDW parameters 0.5 mL (0.5 mL blood in 3 mg K_2EDTA) can also be used. Medical laboratory technologist should have good knowledge on which parameters of CBC should be analyzed with which blood and anticoagulant ratio.

Keywords: Blood anticoagulant ratio, Complete Blood Count, Under filling vacutainers