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The study on blood glucose level at different combination of anti-glycolytic agents

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Measurement of blood glucose level is essential in the diagnosis of diabetes mellitus. The concentrations of blood glucose will continue to decrease over a period of time after collection of blood, due to the glycolysis in the red cells, leucocytes and platelets. This loss of glucose may be prevented by adding anti-glycolytic agent into the sample collection tube. This study was carried out to find out the changes of blood glucose level during collection period and to evaluate a suitable combination of anti-glycolytic agents in order to preserve the glucose levels in blood samples. Venous blood samples were taken from 30 subjects into 5 types of blood collection tubes, each containing EDTA, NaF+EDTA, NaF+ K.Ox, NaF + EDTA+Citrate Buffer, and NaF + Citrate buffer respectively and labeled as A,B,C, D and E. Plasma was separated at different time intervals of ½, 1, 2, 6 and 24 hours after collection and glucose levels of the samples were measured colorimetrically by glucose oxidase method at 30-32°C. Rate of glucose loss was calculated in comparison to glucose concentration at half an hour. The rate of glucose loss was increased with time since collection for all the tubes. After 2 hours, the average rate of glucose loss was 19.7, 13, 11.3, 12.8 and 10.6% in tubes A,B,C,D and E, respectively. After 6 hours, rate of glucose loss was 42.7, 17.7, 16.8, 19.2, and 18.3% in tubes A, B, C, D and E, respectively. After 24 hours, the average rate of glucose loss was 84.6, 41.3, 25.2, 45.3 and 64.9% in tubes A, B, C, D and E, respectively.

After 2 hours, the rate of glucose loss was less in the tube E compared to the other tubes. But after 6 and 24 hours, the rate of glucose loss was less in tube C. Average blood glucose level was low and also rate of glucose loss was high in tube A all the time. Thus, the chemical in tube A was not a suitable anti-glycolytic agent. Anti-glycolytic agent in tube E stabilized the blood glucose level up to 2 hours with minimal glucose loss when compared to rest. Further, the rate of glucose loss was 5.9% after 1 hour and 10.6% after 2 hours. In tube C, the rate of glucose loss was less after 2 hours (16.8% at 6 hours and 25.2% at 24 hours). Based on these findings, chemicals in tube E would be suitable for analyzing blood glucose within 2 hours and chemicals in tube C would be suitable for analyzing after 2 hours.

Keywords: Blood glucose, plasma, glucose concentration, anti-glycolytic agent