Influence of temperature incubation and CoCl$_2$ concentration on blood hemorheological properties and erythrocyte morphological parameters

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Abstract

Alternation of red blood cells (RBC) morphology and viscoelasticity are some of the basic indicators for human health, disease diagnosis and treatment. It is known that blood viscosity is strongly influenced by temperature changes. Cobalt chloride (CoCl$_2$) is a water soluble agent shown to improve hematological parameters by increasing red blood cell count, hematocrit, hemoglobin content in case of anemia or severe blood loss. We examined blood samples of RBC suspensions, which were incubated in vitro at different temperatures for one hour (4°C, 22°C and 37°C) and treated with different concentrations of CoCl$_2$ - 50 μM and 500 μM.

The apparent RBC viscosity was measured at 37°C of all samples and erythrocyte morphological characteristics were evaluated as well. The preliminary results showed that the rheological blood properties were changed as a consequence of incubation at different temperatures. Red blood cell morphological alterations were detected when different CoCl$_2$ concentrations were added.

Keywords: RBC suspensions rheology, erythrocyte morphology, cobalt chloride (CoCl$_2$)