

Effect of rouleaux formation of erythrocytes in blood of patients treated by oncothermia

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Background: Observation and explanation of rouleaux phenomenon induce permanent debate started from its discovery. The aggregation of erythrocytes is a prominent feature in humans and other species “athletic” species [1]. In vitro studies have shown that aggregation of blood increases as shear rate decreases. Aggregation also depends on hematocrit and the concentration of macromolecules in the plasma or suspending medium [2], and in the presence of high molecular weight polymers, such as plasma proteins or dextrans, aggregate to form rouleaux and rouleaux networks [3]. However, the circumstances in which aggregation occurs is not well understood. Correlations of aggregation parameters with C-reactive protein and fibrinogen was proven in unstable angina, acute myocardial infarction, and bacterial infection [4] as well.

Our aim in this paper is to describe the systemic observations of blood samples before and after oncothermia, trying to clarify the oncothermia effect on blood.

Methods: Blood samples nude mice and voluntary humans were studied before and after oncothermia treatment. Samples were carefully collected from tail’s venue of mice and from finger capillaries of humans. Samples of venous blood from humans were also collected for comparison. The individual blood-collection was made before and after oncothermia treatment, as well as systemically performed in subsequent treatments. Samples were promptly (freshly) measured by dark-field microscopy and archived by high resolution photo- or video-techniques.

Results: The rouleaux formation of blood samples characteristically was obtained from the individuals before the treatment, but this phenomena was not observable in every cases in mice. However, in the cases, when the rouleaux formation was shown, oncothermia treatment has changed the aggregation, and the samples were mostly free of erythrocyte aggregates. These phenomena were independent of the treatment localization and also from the venous or arterial origin of the blood sample, and were observed both in humans and mice. In blood specimens where the rouleaux formation of the erythrocytes were observed, oncothermia dissolved the aggregates.

Conclusions: Measurement of the oncothermia effect on rouleaux phenomena could lead us a simple control of the treatment efficacy, but our present data are not eligible for definite conclusions. Establishing a theoretical model and further experimental investigations of the phenomenon is in progress.

References:

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