Summary

Title: The rheological response to a history of knee joint loading

Aim: The purpose of this work is to illustrate the possibilities of rheological interpretation of passive resistance in the knee joint during simple forced movement of the knee flexion and extension in the sagittal plane.

Methods: With the help of biorheometrical measurements, we identify the effect that a weight bearing history has on the actual rheological properties of the knee joint. The methods are based on an experiment carried out in vivo, passive momentum (resistance) of the knee joint during forced flexion and extension are measured and expressed as the specific rheological response of the knee joint. The dependence of passive momentum M on the angle of flexion φ is hereby characterized as the total rheological characteristic of passive forces on the whole knee and its surroundings. The graphical interpretation of the duration of the momentum force is named – biorheogram.

Result: Results of experimental study presented in this dissertation distinctly shows that rheologic interpretation of passive resistance in the knee joint during simple forced movement of the knee joint in the sagittal plane is possible in flexion and extension.

Conclusion: Rheologic description of hysteretic response of passive resistance {moment of force} of the knee joint was determined at least during first approximation. We managed to construct a measuring apparatus which is called biorheometr and elaborated also the methods of measurement. This equipment complexly measures rheologic properties of knee joint in vivo.

Key words: Biorheogram, Biorheometr, Knee Joint, Passive Resistance, Rheologic Response, Rheological Properties, Stress History.