Hemorheological profile change after chemotherapy: insight into the microrheological change mechanisms

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The subject of this study was to estimate the effect of neoadjuvant chemotherapy (NACT) on the basis of platinum (cisplatin) inpatients (n = 34) with solid tumors on parameters of hemorheological profile. Before and 21 days after each cycle NACT (1 to 3 cycles) the hemorheological profile included blood and plasma viscosity; hematocrit (Hct), RBC aggregation (RBCA) and deformability (RBCD) was recorded. Blood viscosities (BV) were decreased significantly after each cycle of treatment (from 10 to 20%). These viscosity changes were accompanied by Hct lowering by 18%. Plasma viscosity (PV) was reduced by 9% under these circumstances. The results obtained herein demonstrate that two change mechanisms of the hemorheological profile there are under cisplatin chemotherapy. The first mechanism is connected with a decrease of Hct, in a number of cases, up to anemic values (Hct>30%) and PV alteration. Therefore blood viscosity was decreased because both main factors influencing on it were statistically significant lowered. There were positive correlations between BV and Hct (r=0.480) and PV (r=0.680). The second mechanism is connected with positive changes of RBC microrheological properties after cisplatin treatment. Taken together these positive alterations of hemorheological profile can result in an improvement of blood transport potential for oxygen and drug delivery into the tumor tissue.

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