SUMMARY

7.1. INTRODUCTION

Cell membrane microparticles are spherical, small structures released from biological membranes of many types of cells under the influence of physiological and pathological factors. The microparticles are about 0.1-1.0 μm in size and are composed of fragments of stem cells containing membrane proteins and part of the cytoplasmic and nuclear content. Microparticles do not have a cell nucleus, but on their surface they have antigens characteristic of the cells of origin. Due to the different activity of cell membrane microparticles and their increased concentration in the course of many diseases, it seems that microparticles may have a significant diagnostic potential, and the examination of their number may be used to monitor the patient's condition. The aim of the study was to determine the number of microparticles derived from blood and endothelial cells and their correlation with selected markers of the haemostatic system in patients with selected haematopoietic malignancies before treatment.

7.2. MATERIAL AND METHODS

The material for the research was venous blood collected on the day of admission of patients to the Department of Hematology of the Medical University in Białystok. Peripheral blood counts, analysis of hemostatic system parameters (PT, APTT, concentration of fibrinogen, D-dimers, PAP, TAT and F1+2) and determination of the number of microparticles from blood cells and endothelium were performed. Five groups of respondents were distinguished. Fifty-six (56) patients were classified according to disease diagnosis: patients with PV (n = 12), ET (n = 10), CLL (n = 17), AML (n = 11), MM (n = 6). Blood morphology was measured using an automatic hematology analyzer. PT, APTT, concentration of fibrinogen and D-dimers were determined using automatic analyzers. Determination of the TAT, PAP and F1+2 complexes was determined using ELISA tests. The number of MPs of platelet, leukocyte, erythrocyte and endothelial origin was measured by direct fluorescence using a flow cytometer using specific monoclonal antibodies characteristic for individual types of microparticles: anti-CD42b for PMP, anti-CD45 for LMP, anti-CD235 for ErMP and anti-CD144 for EndMP.

7.3. RESULTS

There was a statistically significant increase in PT in the course of ET and AML, as well as in APTT in the course of PV and AML. The concentration of fibrinogen was statistically

significantly higher in patients with PV and CLL. A statistically significant increase in the concentration of D-dimers was observed in the groups of subjects with PV, CLL, AML and MM. The concentration of TAT complexes was higher in patients diagnosed with PV and ET, the concentration of PAP was increased in patients with PV, CLL, MM, and the concentration of F1+2 was lower than in the control group in the course of ET and AML. In all investigated diseases, a statistically significant increase in the amount of all investigated types of microparticles in relation to the control group was demonstrated. In the case of PV, a significantly increased amount of ErMP was observed, while in ET, a dominant increase in PMP was found in relation to the remaining populations of microparticles. In CLL, AML and MM groups, an increase in microparticles from all tested cells was observed, with ErMP constituting the highest percentage. Correlation analysis showed that in the course of PV, an increase in the total number of microparticles correlates with an increase in APTT and a decrease in fibrinogen concentration. In the case of ET, along with the increase in the number of MPs, a shortening of APTT and an increase in D-dimer concentration were noticeable. There was a strong positive correlation between the number of microparticles and PT elongation in the course of CLL. A positive correlation between the number of EndMP and PT was observed, and a negative correlation between EndMP and the concentration of fibrinogen. A positive correlation was observed between the number of PMP and PCT. Statistically significant positive correlations between PMP and PLT were observed in patients diagnosed with PV and ET. In the case of the relationship between LMP and WBC, there is a positive correlation in PV and a negative correlation in the course of MM. There is a positive correlation between PLT and PMP ($r = 0.59$, $p < 0.05$). There is a positive correlation between the number of MPs and the total number of all blood cells ($r = 0.88$, $p < 0.05$).

7.4. CONCLUSIONS

Haematological malignances stimulate the release of microparticles from blood cells and endothelium. The number of microparticles released in proliferative diseases may depend on the number of blood cells in the plasma. In haematological malignances, most microparticles are released from cells affected by neoplastic growth. Haematological malignances induce disturbances in the hemostatic system.