Background. The expression of adhesion molecules and other cell-surface molecules is substantial in the communication between plasma cells and bone marrow microenvironment. Many of the cytokines involved in multiple myeloma (MM) pathogenesis, e.g. thrombopoietin (TPO) and interleukin-6 play a pivotal role in different developmental stages of megakaryocytosis and thrombopoiesis. The principal aim of our study was to explore the relationship between thrombopoietic cytokines, megakaryocytes (MKs) and soluble P-selectin (sP-selectin) levels in MM patients before and after anti-angiogenic treatment.

Material and methods. Forty-four patients (20 female and 24 male) with a newly diagnosed MM were examined in three groups, following a division based on the International Staging System, ISS. Plasma levels of TPO, IL-6 and sP-selectin were measured by means of ELISA. Bone marrow specimens were studied to determine the number of MKs and the so-called “naked nuclei” (NN), as well as the expression of platelet-derived growth factor (PDGF).

Results. The comparison revealed a significantly higher concentration of cytokines and sP-selectin in newly diagnosed MM patients compared to healthy volunteers: for TPO, p = 0.01, IL-6, p = 0.0005 and sP-selectin, p = 0.00008, respectively. Marked differences were observed in the concentration of sP-selectin, expression of PDGF and MKs counts between patients with MM stage I and MM stage III. Statistically meaningful correspondences were also found between MKs vs TPO, NN vs TPO, as well as MKs vs MPV, p = 0.009, p = 0.004 and p = 0.0005, respectively. Furthermore, the analysis exhibited some statistically meaningful divergences between initial concentrations of sP-selectin in subgroups with different response after chemotherapy. We found a correlation between sP-selectin and IL-6 (r = 0.57, p = 0.0004), TPO and IL-6 (r = 0.46, p = 0.001) as well as sP-selectin and TPO (r = 0.36, p = 0.043), and sP-selectin and PDGF (r = 0.36, p = 0.03).

Conclusions. Our study has eventually demonstrated that sP-selectin, as a marker of platelet activation, could be a useful marker of maximum response to therapy. Its strong association with another marker like PDGF-AB could further lead to the development of the new combinational therapeutic strategies of anti-angiogenic treatment in MM patients.