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**Clinical and immunological features of invasive aspergillosis in patients with multiple myeloma**

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**Background:** Invasive aspergillosis (IA) often occurs in hematological patients with immunodeficiency after cytostatic therapy or allo-HSCT. Immunological features of IA in patients with multiple myeloma are not well understood.

**Material/methods:** Prospective study in 1998-2015 yy. We used criteria EORTS/MSG, 2008 for the diagnosis of IA. We observed 46 adult patients with proven (4%) and probable (96%) IA. Group I included 22 patients with multiple myeloma (MM), median age was 56 years (range – 41- 65), females - 64%. Group II: 24 patients with acute lymphoblastic leukemia (ALL), median age – 43 years (range 21 -68), median 43, females – 44%.

**Results:** We found that common risk factors before IA development were detected less frequently in patients with MM as compared to ALL, including prolonged neutropenia 45% vs 92% ( $p = 0,01$ ), and lymphocytopenia 27% vs 67% ( $p = 0,02$ ).

In both groups, the primary sites of infection were lungs 100 vs 96%. Probable IA was diagnosed in 96% patients, proven – 4%. The main pathogens were *A. niger* (64% vs 29%), *A. fumigatus* (18% vs 57%) and *A. flavus* (9% vs 14%). We identified significant differences of immunological parameters in MM patients compared to ALL. MM patients were less likely to have decrease in the absolute number of CD4 + ( $0,51 (0,40 \div 0,73) * 10^9/l$  vs  $0,31 (0,07 \div 0,72) * 10^9/l$ ),  $p = 0,04$ ; B-cells CD20 + number ( $0,20 (0,10 \div 0,25) * 10^9/l$  vs  $0,05 (0,02 \div 0,16) * 10^9/l$ ),  $p = 0,04$ ; decrease of the induced production of cytokines TNF- $\alpha$  (380 (356  $\div$  497) pg/ml vs 164 (95  $\div$  440) pg/ml),  $p = 0,02$ ; IFN- $\gamma$  (755 (615  $\div$  1067) pg/ml vs 128 (70  $\div$  795) PG/ml),  $p = 0,01$ ; IL-6 (696 (669  $\div$  720) pg/ml vs 374 (242  $\div$  635) pg/ml),  $p = 0,01$ . The immunoglobulin A production and neutrophils killer activity were significantly higher in MM patients compared with ALL ( $p=0,08$  and  $p=0,001$ , respectively). Overall survival rate in twelve weeks was 100% vs 83%, ( $p = 0,04$ ). Positive prognostic factor of 12-weeks survival was voriconazole use as initial therapy ( $p = 0,02$ ).

**Conclusions:** Significant differences in multiple myeloma patients with invasive aspergillosis were less expressed immunological changes, including prolonged neutropenia, lymphocytopenia, decrease in the absolute number of CD4 +, B-cells, and decrease of the induced production of cytokines compared to ALL-patients. Twelve week overall survival was 100%. Positive prognostic factor of 12th week survival was initial treatment with voriconazole.