Immunological features of invasive aspergillosis in hematological patients after allogeneic hematopoietic stem cells transplantation

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Abstract

Invasive aspergillosis (IA) is a major complication in patients after allogeneic hematopoietic stem cells transplantation (allo-HSCT). The immunological features in these patients are not well understood.

Objectives

Investigation of the immunological features of invasive aspergillosis in hematological patients after allo-HSCT.

Methods

We studied immunological parameters in 16 hematological patients with IA developed after allo-HSCT. For the diagnosis of IA criteria EORTS/MSG, 2008 was used.

Lymphocyte subsets were determined by immunocytochemical method with using monoclonal antibody («DAKO»).

Levels of immunoglobulins in the serum were estimated by nephelometric method for protein analyzer «Turbox plus».

Blood cell supernatants were tested for IFN-g and IL-10 by using an ELISA test («Cytokine», Russia).

Immunological parameters were evaluated in the first 2-4 weeks of IA diagnosis. Patients were followed for 3-6 months.

Results

IA was diagnosed between 18 and 270 days after HSCT (median – 33 days). At the time of diagnosis of IA in 18% of patients viral infection were detected. 12 weeks overall survival was 81%.

Underlying diseases were: acute myeloid leukemia - 36%, acute lymphoblastic leukemia - 25%, chronic myeloid leukemia - 13%, lymphoma - 12%, chronic lymphocytic leukemia - 6% and myelodysplastic syndrome - 6% (Fig. 1).

56% of patients after allo-HSCT have unrelated donors, HLA-matched donors - 31% and HLA-mismatched donors – 13% (Fig. 2).

All patients received immunosuppressive therapy (cyclophosphamide, tacrolimus, methotrexate). Graft versus host disease was observed in 94%.

56% of patients had probable IA (EORTS/MSG, 2008 ). Lung involvement was observed in 94% of cases, central nervous system - 6%. In 25% of cases IA was confirmed by culture. Aetiologic agents were: A. fumigatus, A. niger, A. nidulans.

Humoral immune response was decreased: IgG, IgM expressed as percentage of healthy peoples levels.

Conclusions

Hematological patients after allo-HSCT with invasive aspergillosis have significant disorders of the immune response.