Pneumocystis jirovecii pneumonia in patients with hematological diseases after hematopoietic stem cell transplantation and chemotherapy

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Background

Pneumocystis jirovecii pneumonia (PJP) is life-threatening disease in immunocompromised patients with HIV infection, after solid organ transplantations and hematopoietic stem cell transplantation (HSCT). The number of publications on epidemiology of PJP in patients with hematological diseases after HSCT and chemotherapy (CT) is limited.

Patients and methods

In R. Gorbacheva Memorial Institute of Children Oncology, Hematology and Transplantation of First Pavlov State Medical University of St. Petersburg between 2009 and 2015 yy. were performed 1008 allogeneic hematopoietic stem cell transplantation (allo-HSCT) and 433 autologous hematopoietic stem cell transplantation (auto-HSCT) in adult patients. A retrospective study includes 11 cases of PJP in 2006-2015 years in patients with hematological malignances and non-malignant hematological diseases after HSCT and CT. The median age was 25 y.o. (18-40). All patients received TMP/SMX prophylaxis. ECIL guidelines criteria was used for the diagnosis of proven PJP as well as to evaluate response to therapy. In 100% PJP was confirmed laboratory using real-time quantitative PCR, immunocytochemistry and MONOFLUO test.

Overall survival 12 weeks from diagnosis *Pneumocystis jiroveci*

Overall survival 1 year from diagnosis *Pneumocystis jiroveci*

Results

Incidence of PJP in allo-HSCT and auto-HSCT recipients was < 0,1% in time between 2009 and 2015 yy. After CT this complication developed in 2 patients. All cases of PJP developed in adults. Main underlying diseases were acute myeloid leukemia, acute lymphoblastic leukemia, Hodgkin and non-Hodgkin lymphoma, and primary myelofibrosis. The median day of onset PJP after HSCT was 154 days and after start of CT – 116 days. The main risk factors of PJP was acute or chronic graft-versus-host disease (GvHD) and immunosuppressive therapy in 45,5 %. In 73% and 45,5% of cases, PJP develops after or in combination with invasive aspergillosis and CMV infections. Febrile fever was the main clinical symptom of pneumonia (100%). Therapy with sulfamethoxazole plus trimethoprim was performed in 100% patients. 12 weeks overall survival rate from the diagnosis of PJP was 73%, 1 year – 55%.

alveolar macrophage
Immunocytochemistry
staining with antigen
P.jirovecii

Patients characteristics

N	Age	Diagnosis	Treatment	Day after	Acute-GVHD	Aspergillus	CMV	TMP/SMX
1	30	ALL	CT	-	-	+	-	+
2	25	NHL	auto-HSCT	23	-	-	-	+
3	24	AML	allo-HSCT	258	-	+	+	+
4	25	ALL	allo-HSCT	158	+	+	+	+
5	24	ALL	allo-HSCT	42	-	+	-	+
6	25	ALL	allo-HSCT	18	+	-	+	+
7	18	AML	allo-HSCT	154	+	+	+	+
8	18	AML	allo-HSCT	46	+	+	+	+
9	31	HL	allo-HSCT	336	+	+	-	+
10	40	PM	allo-HSCT	293	-	+	-	+
11*	40	HL	CT	-	-	-	-	+

ALL-acute lymphoblastic leukemia; AML-acute myeloid leukemia; HL-Hodgkin lymphoma; PM-primary myelofibrosis; HSCT-hematopoietic stem cell transplantation; CT-chemotherapy;
* -HIV-patient

Conclusions

Pneumocystis jirovecii pneumonia developed in < 0,1% patients after allo-HSCT or auto-HSCT between 2009 and 2015 yy. The main risk factors were acute and chronic GvHD and immunosuppressive therapy. Sulfamethoxazole plus trimethoprim were used in 100% cases. Overall survival rates at 12 weeks and 1 year from the diagnosis of PJP were 73% vs 55%.