

Highlights of the 24th European Hematology Association Congress, Amsterdam 2019

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Summary

24th Congress of European Hematology Association was held from 13th to 16th July in Amsterdam, Netherlands. Over 12000 specialists took part in the meeting and more than 360 oral and 1300 poster presentations were made, covering most of hematology fields. The main purpose of this article was to review the most important and relevant topics discussed during congress in such areas as hematopoietic stem cell transplantation, lymphomas, acute leukemia, multiple myeloma and other plasma cell disorders, myeloproliferative neoplasms and infectious complications in hematological patients.

In this review, we briefly describe results of works which, in view of the authors, are of most clinical and scientific significance for hematopoietic stem cell transplantation. Moreover, the emerging topics and trends in different fields of hematology were discussed. Other interesting studies and presentations can be accessed through the EHA online-library.

Keywords

EHA congress, hematopoietic stem cell transplantation, lymphoma, acute leukemia, multiple myeloma, myeloproliferative neoplasms, infectious complications.

Introduction

More than 12.600 hematologists had the opportunity to exchange experience during 24th European Hematology Association (EHA) Congress that took place in Amsterdam, the Netherlands, from 13 to 16 June 2019. That was the largest EHA Congress to date, with a growth of more than 1000 participants from 2018.

After opening of the Congress by the EHA President Pieter Sonneveld, its participants could choose between more than 360 presentations and more than 1300 poster reports that covered almost the entire spectrum of clinical and experimental hematology.

The aim of current report is to highlight the most important data as viewed by 12 participants from Raisa Gorbacheva Memorial Institute for Pediatric Oncology, Hematology and

Transplantation (St. Petersburg), each representing special area of hematology and transplantation.

In total, almost 50 poster and 2 oral reports were presented by colleagues from Russian centers from St. Petersburg, Moscow, Kirov, Novosibirsk in various areas of hematology, including acute leukemia, lymphoma, myeloma and other monoclonal gammopathies, chronic myeloid leukemia, myelodysplastic syndrome and others myeloproliferative diseases, chronic lymphocytic leukemia and other non-associated malignant diseases. Among the oral reports the first was presented by our colleagues from the National Research Center for Hematology on the topic of chronic myeloid leukemia in pregnant women. The second report was demonstrated by representatives of the Russian Research Institute of hematology and transfusiology of FMBA was devoted to predictors of response to therapy in patients with immune thrombocytopenia.

Hematopoietic stem cell transplantation

Several sections were devoted to hematopoietic stem cell transplantation: 4 clinical and 1 experimental session, including a presidential symposium, which included 2 reports related to this topic. Current focus is the optimization of GVHD prophylaxis for alternative donor transplantation with post-transplant cyclophosphamide, aspects of the conditioning regimens, as well as the role of intestinal microbiota in the outcomes of allo-HSCT.

Wang Y. et al. conducted a study to compare the GVHD risk in patients transplanted from haploidentical donor who received anti-thymocyte globulin (ATG) and low-dose post-transplant cyclophosphamide (PTCy) regimen to those who received ATG only. The results of this study showed that unmanipulated haploidentical transplantation with ATG-PTCy as a GVHD prevention strategy resulted into lower rates of both acute and chronic GVHD without influence on the graft-versus-leukemia (the combined treatment resulted in lower severe acute GVHD rate (Hazard Ratio 0.18; $P=0.004$), chronic GVHD (HR 0.39; $P=0.010$), and transplant-related mortality (HR 0.24; $P=0.023$) but slower myeloid and platelet recovery (HR 0.27 and 0.30; both $P<0.001$) [1].

There were other studies devoted to modifying the conditioning regimens and GVHD prevention in patients who received haploidentical transplantation. The work of El-Cheikh J. et al. demonstrated the advantage of adding ATG to thiotepa-busulfan-fludarabine with PTCy as conditioning in this patients group. The investigators have found that ATG as part of pre-transplant conditioning led to a significant reduction in acute GVHD and non-relapse mortality (NRM) at 24 months without significant effects on progression-free survival (PFS) or overall survival (OS) [2].

Also at the alternative donor transplantation session Li C. presented results of the study showed conditioning with busulfan following cyclophosphamide improved results in alternative donor transplantation for patients with thalassemia major (9-year OS was 95.5% in matched sibling donor HSCT vs 92.7% in alternative donor HSCT). However, this approach is accompanied by a higher acute GVHD III-IV stage than sibling donor transplantation [3].

Prof. Arnon Nagler on behalf of EBMT Acute Leukemia Working Party reported the results of study: Post-transplant cyclophosphamide (PTCy) vs ATG for graft-versus-host disease (GvHD) prophylaxis in T-replete haploidentical transplantation for acute lymphoblastic leukemia. A total of 434 ALL patients were included; 336 received PTCy-based regimen and 98 received ATG with the median follow-up was 24 months. Similar outcomes were seen for engraftment (92.7% ATG vs 93.54% PTCy), as for 100 day incidence of acute GVHD both > Gr II and severe (Gr. II+, 32.7% vs 30.5%; Gr. III+, 11.6% vs 14.1%), and chronic GvHD (27.7% vs 31.7%). In both groups, infection accounted for 32% and 30% of deaths. Relapse incidence was lower in PTCy vs ATG: 2 year RI: 33.8% vs 43%; hazard ratio [HR] 0.61 [95% CI:

0.39-0.94], $p=0.03$), with a trend toward lower non-relapse mortality (NRM) as well (26.7% vs 32.9%; HR 0.68 [0.42-1.11], $p=0.12$). Both 2 year leukemia-free (LFS) and overall survival (OS) were higher for PTCy when compared with ATG (40.3% vs 24.1%; HR 0.67 [0.46-0.96], $p=0.03$, and 48.4% vs 27.4%; HR 0.60 [0.42-0.84], $p=0.003$, respectively). Active disease and lower Karnofsky performance status were associated with lower LFS, OS, while PB grafts were associated with higher incidence of both acute and chronic GvHD [4].

The influence of intestinal microbiota and the risk of GVHD as well as potential for its correction gathered increased attention in the field of HSCT research. Han et al. performed the analysis of intestinal microbiota diversity by the 16S rRNA gene sequencing from 141 patients undergoing allogeneic hematopoietic stem cell transplantation at pre-conditioning, day 0 and day 15 post-transplantation. The microbiota diversity was lower in the aGVHD group compared with non-aGVHD group at day 0 and day 15±1 ($P=0.018$ and 0.009, respectively). The skewed microbial diversity was associated with conditioning ($P=0.017$, day 0, and $P=0.045$, day 15) and usage of β -lactam antibiotics ($P=0.004$, day 15) and correlated with peripheral blood Treg/Th17 ratio. These findings suggest that intestinal microbiota diversity influences aGVHD risk by inflammatory factors and the Treg/Th17 balance [5]. The results of correction of intestinal microbial diversity in 15 patients with steroid-refractory gut aGVHD treated by fecal transplantation was reported by Van Lier et al. With this approach, 11 patients achieved CR defined as GvHD resolution in all cases, without other interventions to alleviate symptoms [6].

These reports encourage further investigation of this therapy in large cohorts and questioning the optimal conditioning and supportive treatment during allo-HSCT.

Lymphoma

The most important reports of this year were dedicated to the treatment of the resistant/refractory (r/r) lymphomas using new targeted drugs, immunotherapy, chimeric antigen receptor T-cell therapy (CAR-T) therapy and combinations of these approaches.

A lot of the attention was devoted to the use of new drugs in the treatment of aggressive B-cell lymphomas. Particularly, the results of the work of Senn L. and his colleagues demonstrated a significant increase in the overall response rate (ORR) (18 vs 45%), including the complete response (CR) (15 vs 40%), PFS (2 vs 6.7 months) and OS (4, against 11.8%) using the combination of rituximab/bendamustine therapy with polatuzumab vedotin in patients with r/r follicular lymphoma and diffuse large B-cell lymphoma (DLBCL) [7].

The results of targeted therapy and immunotherapy in r/r DLBCL with the akalabrutinib/pembrolizumab regimen were presented. The latter approach showed high frequency of severe adverse events, including treatment-related mortality (6 out of 61 patients died, 17 patients stopped therapy due to adverse events), and only modest efficacy (ORR- 23%, CR- 8%) [8]. Therefore, one can conclude that the optimal treatment of r/r DLBCL is yet to be defined in further studies.

There was also promising data on a first-in-class macrophage immune checkpoint inhibitor targeting the “do-not-eat-me” CD47 (5F9) signal in patients with r/r non-Hodgkin lymphoma (NHL) presented by Roschewski M. The ORR was demonstrated in 36%, and CR in 15% patients with DLBCL, and OR in 61% with CR in 24% patients with indolent lymphoma. These results are especially promising, with regard of high potential for combination of CD47 inhibitors with other types of immunotherapy and chemotherapy [9].

The evidence gathered after introduction of CAR-T cell therapy leaves no doubt in the efficiency of this treatment in some of the r/r B-cell malignancies. Current studies are focused on the optimization of this treatment using conditional targeted and immunotherapy. The results of introduction of BTK-inhibitor ibrutinib in combination with anti-CD19 CAR-T cells for r/r mantle cell lymphoma were presented as a poster by Ruella M. et al. This preclinical model demonstrated that ibrutinib could be combined with CAR-T against the B-cell specific CD19 antigen in a rational manner to augment the anti-tumor effect and enhanced survival [10].

There were no significant findings in the treatment of Hodgkin's lymphoma (HL). The main trend is the introduction of brentuximab vedotin (BV) and immune checkpoint inhibitors (ICI) into the earlier stages of the classical HL treatment. Importantly, the efficacy and safety of nivolumab (N) and BV combination were demonstrated for pediatric population. Leblanc T. et al. presented results of study of N-BV as second-line therapy in adult and pediatric patients with primary r/r classical HL (ORR was 82% with CR in 59% of cases; in pediatric group ORR was 81% with CR of 58%) [11].

Nevertheless, the effectiveness of the first-line therapy, radiation therapy and the early use of the response-adapted approach through the use of PET-CT, remains relevant. Fuchs M. in his report brings up the question on the role of PET after 2 cycles of ABVD in patients with early-stage favorable HL treated within the phase 3 GHSG HD16 study. This study included standard treatment arm with 2xABVD following 20 Gy involved-field radiotherapy (FR), and an arm with IF after 2xABVD only after positive PET (Deauville 3-4). Author concluded that in PET-negative patients, omission of FR resulted in poorer tumor control compared to combined-modality treatment. Also it was reported that in early-stage favorable HL, a positive PET after 2xABVD was associated with a larger tumor volume and represented a risk factor for PFS among patients treated with standard chemotherapy. PET-guided treatment intensification in this high-risk subgroup might help to reduce the incidence of relapse [12].

The results of 3-year follow-up of the ECHELON-1 study were presented. It showed more solid improvement of 3-year PFS in the arm of BV in combination with AVD protocol compared to ABVD regimen (83 vs 76%), proving the modest but significant improvement of treatment efficacy, with introduction of BV in the first line of cHL treatment, and may change the standard for the particular population of the patients [13].

Some works presented during poster session deserve special attention, particularly, the poster report by Italian research-

ers who presented their data on the use of ICI before haploidentical transplantation in patients with r/r Hodgkin's lymphoma. This study included a group of patients with (n=28) or without (n=26) ICI before transplantation. The results showed that ICI as a bridge to haploidentical stem cell transplantation significantly improved the PFS in r/r Hodgkin's lymphoma, reduced the relapse rate, however at the cost of increased rate of acute GVHD [14].

The team of researchers from Raisa Gorbacheva Memorial Institute presented their data during poster session. The study presented by Lepik K. et al. demonstrated the 2-year follow up of 101 r/r cHL patients treated with nivolumab. With 2-year OS of 96% and PFS 40.6% (median 17.9) the dramatic improvement of quality of life was demonstrated by this report [15]. The question of possibility of CPI retreatment in patients with r/r HL is currently remains relevant. The results of analysis presented by Fedorova L. et al. demonstrate that patients with relapse of the disease after nivolumab discontinuation sustained sensitivity to nivolumab and achieved a response during retreatment with nivolumab monotherapy or in combination with chemotherapy. These results create the prerequisites for further study of this issue, as well as determining the place of allogeneic transplantation in this cohort of patients [16].

Treatment of r/r T-cell lymphoma remains an unresolved medical problem. Lepik E. reported the analysis of R. Gorbacheva Institute experience in the treatment of r/r TCL. In 34 patients with r/r TCL the 2-years OS were 82%. Patients that had undergone salvage SCT showed significantly better disease status at the moment of last follow up: 12/16 (75%) were in CR, *versus* 3/18 (17%) in patients who did not undergo SCT. The results of this study had again underlined the key role of SCT in the treatment of r/r TCL [17].

Myeloma and other monoclonal gammopathies

A large number of both oral and poster presentations were devoted to multiple myeloma (MM). Dr. Irene Ghobrial in her educational report tried to determine the role of genetic abnormalities, while assessing the role of the microenvironment. Also Dr. Michele Cavo discussed how to implement biological parameters of the disease in the choice of treatment.

In the report of Tacchetti P. about the role of autologous stem cell transplantation (ASCT) in the era of novel therapies, this method is still proved to be a gold standard of frontline intensification therapy of MM, even in MRD-negative patients, with the benefits of double ASCT in patients with high-risk cytogenetic abnormalities.

The issue of improving the outcome in patients with inadequate pre-ASCT response remains unresolved. Preclinical and clinical evidence suggests that the immune checkpoint programmed death-1 (PD-1) receptor/PD-1 ligand axis plays an important role in suppressing immune surveillance against MM, but monotherapy with anti-PD-1 antibody was not effective in patients with MM. The results of phase 1-2, single-arm study of nivolumab with ASCT in MM patients

(NCT03292263) were presented by Pirogova O. et al. [18]. Sixteen patients who had not achieved a complete response (CR), or a very good partial response (VGPR) pre-ASCT were enrolled in the study with the median age 55 years (range, 45-62). The median follow-up was 12 months (range, 7-19). The study showed the encouraging results: at day+100 after ASCT ORR was 56% with CR in 31% pts with relative favorable therapy safety profile [18].

Prof. Philippe Moreau reviewed possible changes in future ESMO guidelines in his presentation about new treatment strategies in MM. Particularly, the combination of daratumumab with standard frontline therapy non-transplant candidates. In the case of r/r MM after immunomodulatory drug based induction the use of PomVD/Kd-Isa or Kd-Dara regimen was proposed. Therapy with Pom-Dexa-Isa regimen was suggested instead of Pom-Dexa and daratumumab monotherapy in cases of second or subsequent relapse.

The question of the efficacy of CAR-T and bispecific T-cell engagers (BiTE) therapy is being actively investigated [19]. The study by Li C. et al. demonstrated an improved efficacy with dual-target CAR-T therapy targeting BCMA and CD38 for r/r MM with a high ORR, especially a higher rate and a longer duration of stringent complete response (sCR) (ORR was 83.3%, including 5 sCR, two very good partial response (PR) and three PR; 12-week PFS is 0.77) [20].

In conclusion, it is worth to note a growing interest in the issues of monoclonal gammopathy of renal significance and MGUS with clinical significance other than renal. Emphasis was placed on the need for clone-targeted therapy, including cytotoxic therapy, as well as anti-plasma cell therapy (rituximab-based therapy, bortezomib-based therapy including ASCT) [21].

The results of treatment performed in 151 patients with monoclonal gammopathy of clinical significance (MGCS) at Raisa Gorbacheva Memorial Institute were also presented by Kudyasheva et al. [22]. Kidney, heart, liver, nervous system and gastrointestinal tract were the most commonly involved organs here. The treatment included chemotherapy in 73% and ASCT in 12.5% patients. Renal involvement and depth of the response to therapy showed a predictive value for overall survival and renal survival of patients with MGCS. The renal response was assessed in 61 patients. The overall survival in patients with CR was 100%; VGPR, 88.4%; PR, 95%; the patients that did not achieve renal response comprised 58.3% (p=0.0031). The 5-year renal PFS in the patients who achieved renal response was 70.9% [22].

Acute lymphoblastic leukemia

Development and use of targeted drugs (mono- and bispecific antibodies, CAR-T) resulted in advances in treatment of the patients with refractory ALL and has become the mainstream approach.

Analysis of 5-year follow-up outcomes in a multinational "BLAST" study of adults with B-cell precursor ALL in complete hematological remission with MRD has demonstrated median OS of 36.5 months after blinatumomab treatment. The median OS was not reached among patients with a

complete MRD-negative remission after first cycle of blinatumomab treatment [23].

The data presented by Markova I. have also shown the results of blinatumomab-based therapy in both children and adults with r/r B-ALL. This retrospective analysis included 120 patients with high risk B-ALL (45% patients were children; 55%, adults). The frequency of responses to blinatumomab was higher in MRD+ patients in comparison to r/r ALL cases (85% vs 62% p=0.007). The therapy also was generally well tolerated in children and adult patients with febrile fever being the most frequent adverse event (76%) [24].

Preliminary results of the GIMEMA LAL2116 D-ALBA trial were presented by Italian group (Chiaretti S. et al.). A dasatinib-blinatumomab combination for the frontline treatment of adult Ph+ ALL patients was the first chemo-free induction-consolidation protocol which demonstrated highly promising rates of molecular responses and survival (1-year OS and PFS values were 96.2% and 91.6%, respectively) [25].

Close attention is currently paid to the study of CAR-T therapy effects in the patients with refractory ALL. According to a retrospective analysis of ELIANA and ENSIGN studies by Grupp S. et al., Tisagenlecleucel appeared effective, with high rates of durable responses, prolonged survival, and a manageable safety profile in patients with high-risk cytogenetic abnormalities with historically poor prognosis (median OS was not reached, 12-year and 24-year survival probability was 74.9% and 66.6%, respectively vs 70.7% and 58.8% in patients without high-risk cytogenetic abnormalities) [26].

The results of phase IV study "CAMPUS-ALL", which evaluated the effectiveness of nelarabine salvage therapy as a bridge to allogeneic stem cells transplantation in patients with r/r T-acute lymphoblastic leukemia/lymphoma, were presented by Candoni A. This study demonstrated the ORR and CR rate of 50 and 36% respectively. In addition, 40% of patients who received nelarabine salvage therapy underwent allogeneic stem cell transplantation with an expected OS at 2 and 5 years of 46% and 38%, respectively. Taking into account the poor prognosis of this population, nelarabine can be considered an effective option for this patient's cohort [27].

Myeloproliferative neoplasms and acute myeloid leukemia

The question of approach to the choice of treatment in patients with resistant myeloproliferative diseases remains unresolved. A separate section was devoted to high-risk myelodysplastic syndromes (MDS) resistant to hypomethylating agents (HMA). The main diagnostic task in these patients is to reveal specific mutations for targeted therapy.

For this group of patients, allogeneic transplantation remains the standard with the "7+3" regimen as a "bridge" therapy pre-transplant. In case of non-transplant candidates, it is necessary to include them into clinical trials (IDH2 inhibitors, venethoclax, immune checkpoint inhibitors).

Search for a new drugs in the treatment of patients with r/r MDS/acute myeloid leukemia (AML) remains quite relevant. One of studies included patients with r/r MDS/AML

who were treated with a first-in-class macrophage immune checkpoint inhibitor targeting CD47 with or without azacitidine. Along with good tolerability of this combination, encouraging efficacy was observed (ORR 100% for MDS, 64% for AML) [28].

The updated results from the phase I study of safety and efficacy of AMV564, a CD33/CD3 T-cell engager in patients with r/r AML demonstrated acceptable safety profile and monotherapy activity: bone marrow blast reductions were observed in 17 (63%) of 27 efficacy-evaluable patients; at the doses of 100 mcg or higher, ORR were observed in 3 of 9 evaluable patients [29].

The results of the phase III randomized study "ASTRAL" were also presented, which did not show statistically significant difference between guadecitabine and investigators choice therapy in the primary efficacy endpoints of CR and OS in treatment-naïve AML patients who were not eligible for intensive chemotherapy [30].

New agents appear in the treatment of myelofibrosis resistant to ruxolitinib (e.g. sotatercept). A multi-center phase II study of luspaterecept in myelofibrosis was initiated (NCT03194542). This agent has already shown its efficacy in the treatment of anemia and low risk MDA in the previous "MEDALIST" trial [31].

The search for epigenetic mutations in all patients with CML also becomes the most important issue. Based on the data of NGS analysis in this group of patients, it is possible to use a combination therapy with tyrosine kinase inhibitors and new targeted drugs as the first-line therapy [32].

Approaches to the treatment of patients with unfavorable mutations in CML were actively discussed. A team from R.Gorbacheva Institute presented the data on retrospective analysis of 79 BCR-ABL^{T315I}-positive CML patients. It was shown that only CML phase at the time of mutation detection could significantly affect survival in the whole group (all patients in blast crisis died within first year after T315I identification, median survival time was 1.3 month). Allo-HSCT is an effective method of treatment for this group of patients in case of good selection, with regard to transplant risk, especially for patients in chronic phase (CP) ≥ 2 (5-year OS after allo-HSCT was 37% with median survival time of 5 month; seven patients were alive for more than 2 years after allo-HSCT; two, for >6 years). At the same time, administration of pharmacotherapy in the first CP is an effective method of treatment, which allows to control the disease for a long time [33].

The highly debatable topic reported by Chelysheva E. et al. was the issue of pregnancy in female patients with CML. The analysis of 305 cases of the European LeukemiaNet Registry described CML patients in terms of pregnancy/conceptions management and outcome, as well as demographics, clinical features of CML, and characteristics of children. The results of this study demonstrated that the most pregnancies in females with CML resulted in normal childbirth, with no increase of birth abnormalities, in spite of TKI use at conception, even if this treatment was mostly stopped at the implant stage. The study has also shown the opportunity for differ-

ent therapies during pregnancy, if required. These promising data will allow to create a unified approach to the treatment of this cohort in the future [34].

Infectious diseases in hematology patients

The issue of prevention, diagnosis and treatment of infectious complications in hematologic patients remains at central problem. A prospective multicenter study of the SEIF-EM group was presented. It demonstrated improved clinical outcome in hematologic malignancies patients with lung infiltrates if BAL-driven antimicrobial treatment was implemented (120-d OS was 78% vs 64%; $P=0.046$, and 120-d attributable mortality comprised 11% vs 25%; $P=0.018$) [35].

The issue of fluoroquinolone prophylaxis during neutropenia was voiced again. According to the study of García A. B. et al. the withdrawal of quinolone prophylaxis in prolonged neutropenia associated with hematological malignancies treatment is a safe strategy with no impact on mortality [36].

The issue of infection control in patients after CAR-T therapy remains largely unstudied. French colleagues in their work call for further research of timely and accurate diagnosis of infectious complications in this group of patients, as well as the development of an algorithm for differential diagnosis between infection fever and cytokine release syndrome [37].

Infectious complications remain an actual problem in immunocompromised patients including patients using new agents in therapy. Participants from Raisa Gorbacheva Memorial Institute presented a series of reports regarding this issue. Despite many reports about benefit of anti PD-1 antibody therapy for the treatment of Hodgkin's lymphoma (HL), risk of infection among patients receiving nivolumab is still unknown. In this respect, 112 patients with r/r HL that were observed and treated with nivolumab (3 mg/kg) in at the R. Gorbacheva Institute between 2016 and 2018. Incidence of infectious complications in r/r HL treated with nivolumab was 10%, with onset at the median time of 98 days. Etiology of infectious complications presented by bacterial infections was 37.5%, invasive fungal diseases, 25%, and viruses, 37.5%. Primary chemoresistance was a risk factor for infection complications. Where with infections could be managed successfully and carry favorable prognosis [38].

Despite significant success of novel agents, HSCT still takes a special place in treatment of Hodgkin's lymphoma (HL) patients. A prospective observational study by M. Popova et al. included 86 patients with classical r/r HL who underwent allo-HSCT from 2002 to 2018. reported the analysis of IFD in this cohort of patients. Incidence of pre-existing IFD in children and adults with r/r Hodgkin's lymphoma allo-HSCT recipients was 12.8%. Incidence of IFD after allo-HSCT in naïve patients with Hodgkin's lymphoma was 17.6%. The major etiology agent both before and after allo-HSCT were *Aspergillus spp.* Development of IFD after allo-HSCT was not associated with decrease of the 2-year OS rate (69.2% vs 74%, $p=0.77$) [39].

However, mold infections are the most frequent pathogen, but yeast infections are associated with high risk of mortality.

The aim of our study was to estimate epidemiology of invasive yeast infections in large HSCT recipients' cohort over the 10-year period of transplant activity in CIC725. Incidence of invasive yeast infections for the 10 years of observation was 1.2%: 1.4% in allo-HSCT recipients; 0.9%, in auto-HSCT setting. *Candida spp.* was the main etiological pathogen (87%). Overall survival at 30 days from the diagnosis of invasive yeast infections was 60%. Central venous catheter removal was the only factor which significantly improved OS at 30 days after invasive yeast infection diagnosis (91% vs 17%, $p=0.001$) [40].

Together with colleagues from I. I. Mechnikov North-Western State Medical University, we have analyzed clinical data from 780 patients with invasive aspergillosis [41]. *Aspergillus spp.* were isolated from 227 patients. The patients with "rare" pathogens accounted for 8% of patients with isolated *Aspergillus spp.* cultures. IA caused by "rare" pathogens, more often occurred in children (22%). The features of IA caused by "rare" pathogens are as follows: long-term lymphocytopenia (67%, median, 21 days), combination of two or more pathogens (44%), high relapse rate (33%). Survival of patients with "rare" pathogens did not differ from the total cohort of patients (82%) [41].

Conclusion

In the era of new drugs, as well as the development of immune and cellular therapy, the main task is to find the optimal approach to patients with r/r hematological malignancy, as well as in patients with a high risk of an aggressive course of the disease.

Despite the emergence of a huge variety of new drugs and technologies, for most diseases, this question remains far from resolution. At the same time, hematopoietic stem cell transplantation retains its position as the curative method of treatment for a wide range of patients.

Conflict of interest

The authors report no conflicts of interest.

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Актуальные материалы 24-го конгресса Европейской Ассоциации Гематологов, Амстердам 2019

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Резюме

С 13 по 16 июля 2019 года в Амстердаме, Нидерланды, состоялся 24-й конгресс Европейской Ассоциации Гематологов (ЕНА). Объединив более 12 тысяч специалистов, он стал самым крупным конгрессом за всю историю ЕНА. На площадках конгресса были представлены более 360 устных и 1300 постерных докладов, которые затронули практически весь спектр вопросов клинической и экспериментальной гематологии.

Основной задачей данного обзора стало освещение наиболее актуальных вопросов, затронутых на конгрессе, в таких областях, как трансплантация гемопоэтических стволовых клеток (ТГСК), лимфомы, острые лейкозы, множественная миелома и другие плазмоклеточные дискразии, миелопролиферативные заболевания, а также инфекционные осложнения у гематологических пациентов.

В обзоре были отражены данные порядка 40 работ, которые, по мнению авторов данного сообщения, имеют наибольшую практическую и научную значимость для ТГСК. Также были выделены основные тенденции различных гематологических направлений. С данными других интересных исследований и докладов, представленных на конгрессе, можно ознакомиться, используя материалы онлайн-библиотеки ЕНА.

Ключевые слова

Конгресс ЕНА, аллогенная трансплантация гемопоэтических стволовых клеток, лимфома, множественная миелома, миелопролиферативные заболевания, острые лейкозы, инфекционные осложнения.