Candidemia in large tertiary pediatric hematology/oncology center in Russia: etiology and treatment outcomes - results of five years analysis.

MD, PhD Solopova G.G., MD Pirumova R.P., Prof. Maschan A.A., Prof. Novichkova G.A.

D. Rogachev National Research Center of Pediatric Hematology, Oncology and Immunology, Moscow, Russia

OBJECTIVES

Invasive infections due to *Candida spp.* are among the leading causes of morbidity and mortality in immunocompromised pediatric patients. Candidemia incidence still remains high, despite continuous efforts in prophylaxis and improvements of diagnostics and treatment tools. It impacts negatively not only outcomes of cancer treatment, but also raises the incurrent treatment costs. As for now, there are no data available on the epidemiology of invasive candida infections in pediatric hematology/oncology patients in Russia.

METHODS

All blood cultures drawn from 01.01.2013 to 01.01.2018 and all first patient-episode pairs were included. Spectrum of *Candida* species, patient's characteristics, treatment strategies and outcomes were analyzed.

RESULTS

During study period, 54 episodes of candidemia occurred with identification of 56 isolates of *Candida spp.* Total number of patients was 52 (34 boys/18 girls), 2 patients experienced 2 separate candidemia episodes and in 2 cases more than one *Candida spp.* was cultured. The median of age was 5,6 years (7 months – 21,8 years). The majority of patients had hematological malignancy (n=22, 42%), 18 patients - primary immunodeficiency (35%) and 12 patients - solid tumors (24%). Seventeen (32%) patients were recipients of HSCT with a median 3 months (7 days – 32 months) after transplant. Interestingly, half of the episodes (27) occurred at a granulocytes level above 1500/mm³, while the others with granulocytes less than 500/mm³. 25% of cases were classified as CLABSI. Associated risk factors were: enterocolitis 36%, systemic corticosteroids use 27%, multiple organ failure 25%, TPN 18%, hemodialysis 7%. Septic shock occurred in 25% of cases and dissemination to different organs was noted in 20%. Clear predominance of *Candida* non-albicans was noted and *C. parapsilosis* was responsible for the majority of episodes (52%) (Picture 1). As a first line therapy 33 patients (63%) received echinocandins, 9 – lipid amphotericin B, 8 – fluconazole and 4 – voriconazole. In all cases antifungals were started promptly after isolation of *Candida spp.* 7 patients required second line therapy (4 – echinocandins, 3 - lipid amphotericin B) due to toxicity effects. Central line was removed in 41 (76%) cases with a median of 2 days (0 – 12 days) after (+)-ve blood culture.

Outcomes: In 35 episodes (65%) favorable outcome was noted (33 patients), whereas 19 patients died. Mortality directly attributed to candidemia was 11% (6 cases) with the median interval of 18 day (3 – 37 days) after 1-st (+)-ve culture. Thirteen patients died from progression of onco-hematological disorder and multiple organ failure. Importantly, was noted that failure to remove central line was associated with significantly higher mortality rate (84,6 vs 19,5%, p<0,0001).

CONCLUSIONS

Invasive candidiasis is a common complication in pediatric hematology/oncology patients. In our hospital during 2013-2017 candidemia accounted 36 patients per 10000 hospitalizations and 6,5% of all bloodstream infections. *C. parapsilosis* was responsible for the majority of cases. Echinocandins have proven to be an effective treatment, even in *C. parapsilosis* cases. The attributive mortality was 11%. For success treatment prompt initiation of antifungal therapy and central line removal are essential.

Picture 1