INVASIVE CANDIDIASIS IN INTENSIVE CARE SETTING

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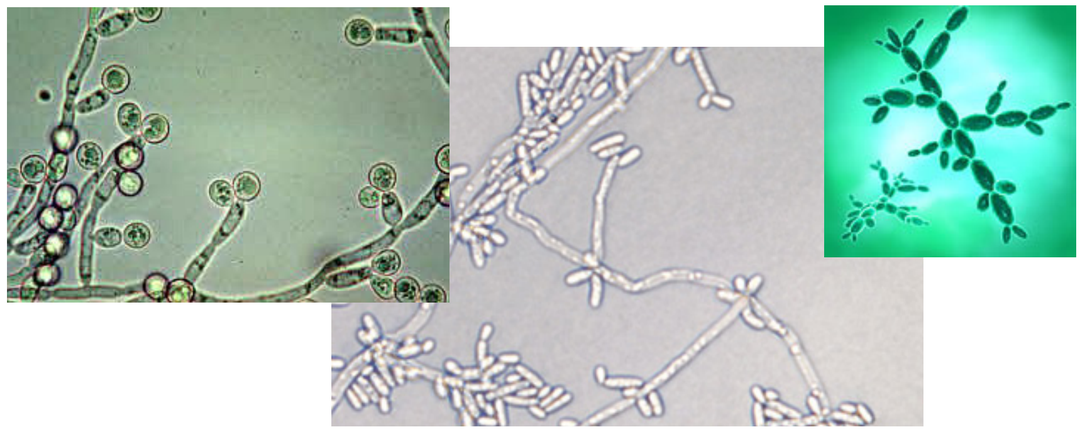


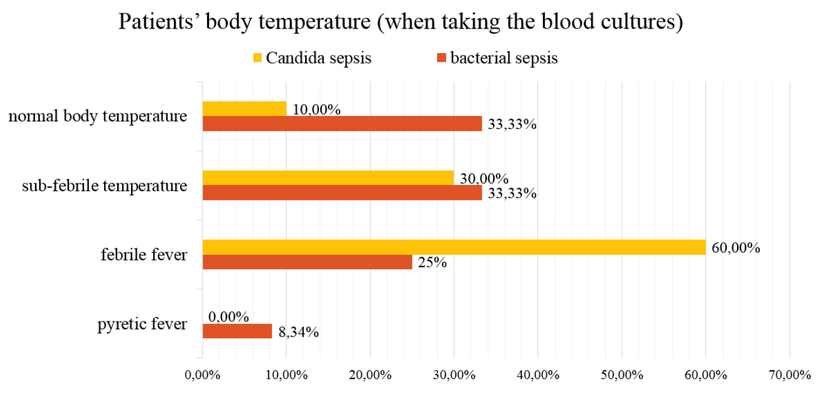
According to numerous researches a significant increase in the number of invasive infections caused by Candida spp. has been registered lately, especially in patients of intensive care units (ICU): from half to two thirds of all candidemia episodes occur in critical care setting. It is ascertained that they are third frequent out of four most important causes of bloodstream infections in clinical practice. Moreover, mortality of patients with invasive candidiasis is approximately 40%, which is higher than that associated with other sepsis causative agents.

There is known more than 200 species of Candida yeasts, but only some of them can cause diseases in pediatric patients. C albicans remains the leading cause of invasive candidiasis (37,6-55,5% of cases) in intensive care units, but an increasing trend of non-albicans Candida spp. has been found worldwide. C parapsilosisis the second leading etiology of invasive Candida infection (approximately 20% of cases). The origin of this yeast is mainly exogenous, either through horizontal transmission or adherence to foreign devices (such as catheters and other devices). Other Candida spp., most prominently C. tropicalis, C. glabrata, C. krusei, and C. lusitaniae, account for 10% to 15% of cases.

THE PURPOSE of our study was to characterize invasive Candida infection in ICU patients of Municipal Children's Infectious Diseases Hospital (MCIDH), Minsk, Republic of Belarus. We conducted a retrospective study of medical records of patients who underwent treatment in ICU of MCIDH in 2015-2016 and had diagnosis of Candida sepsis (n=10) and bacterial sepsis (n=12). The diagnoses were confirmed with positive blood cultures. We evaluated the duration of candidemia, clinical features of the disease, levels of RBC, HGB, WBC, PLT, neutrophils, lymphocytes, CRP and PCT. Mann-Whitney U test was used for statistical analysis, the results are presented as medians and interquartile ranges (IQR).

RESULTS. The median age of children in the group with Candida sepsis was 6 months (range 3-8 months) and in the group with bacterial sepsis – 7,5 months (range 3-39 months). 80% of the patients developed invasive candidiasis on the background of complicated postoperative period (all of them were operated for various congenital anomalies including those of abdominal cavity), 20% - on the background of bacterial sepsis. Before the development of fungal sepsis all of the children had central venous catheter (CVC) for median 19 days (range 11-28 days) and received massive combined antibiotic therapy (from 2 to 9 drugs) for more than 7 days. 80% of the children also received preventive antifungal therapy.

Among the studied cases of Candida sepsis **C.parapsilosis** was found as a causative agent in **80%**, **C.lusitaniae** – in **10%** and **C.albicans** – in **10%**. The **median duration of candidemia** (from first positive till first negative blood culture) was **12 days** (range 8-33 days). Blood sanitation was observed on 10-14 day of antifungal therapy in 60% of the patients; other 40% had repeated positive blood cultures. In **59%** of bacterial sepsis cases causative agents were **Gram-positive** (S.aureus, S.pyogenes, S.pneumoniae, S.agalactiae), in **33%** – **Gram-negative** (A.baumanii, H.influenza b, A.xylosoxidans) and in **8%** of cases both **Gram-positive and Gram-negative** microorganisms were found.



When taking the blood cultures all the patients in both groups were in critical condition due to SIRS and MOF. Pyretic fever was observed in 8,34% of children with bacterial sepsis, febrile fever – in 60% of patients with fungal sepsis and 25% of patients with bacterial sepsis, sub-febrile temperature – in 30% and 33,33% respectively. 10% of patients with invasive candidiasis and 33,33% of patients with bacterial sepsis had normal body temperature. Median **maximum temperature in patients with fungal sepsis** was **38,3°C** (range 38-38,8°C), while in patients with **bacterial sepsis** – **38,05°C** (range 37,5-38,7°C) (p>0,05). **Median duration of fever** was **6,5 days** (range 3-8 days) **in the first group** and **2,5 days** (range 1-5,5 days) **in the second group** (p>0,05).

When studying the complete blood count, **anemia, thrombocytopenia and neutrophilia on the background of normal leucocytes' level** were found **in children with invasive candidiasis** while **anemia and leukocytosis with neutrophilia** were found **in patients with bacterial sepsis.** When comparing different laboratory indicators in both groups **the significant difference** (p<0,05) was found **in the levels of erythrocytes, leukocytes, thrombocytes and PCT** with their lower levels in children with fungal sepsis.

CONCLUSIONS. The prevailing causative agent of invasive candidiasis in ICU of MCIDH, Minsk is C.parapsilosis. Clinical characteristics of Candida sepsis include febrile fever (median level 38,3°C, range 38-38,8°C) with median 6,5 days (range 3-8 days) duration when etiotropic therapy is administered; anemia, thrombocytopenia and neutrophilia on the background of normal leucocytes' level. According to our study, invasive Candida infection is characterized with lower levels of erythrocytes, leukocytes, thrombocytes and PCT comparing to bacterial sepsis. However, we couldn't define any specific markers of fungal sepsis which corresponds to literature data. Thus, we think that it's more efficient to consider not clinical and laboratory data, but the presence of risk factors, such as prolonged massive antibiotic therapy, CVC and lack of dynamics in treating of bacterial sepsis or repeated worsening of patients' state in ICU when revealing patients with invasive candidiasis.