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Analysis of Comorbidity of the Patients Affected by Staphylococcal Bacteremia/Sepsis in the Last Ten Years

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SUMMARY

Introduction: Staphylococcal bacteremia/sepsis is one of the most serious bacterial infections around the world. In individuals with pre-existing diseases, there is always an increased risk of infections occurring due to impaired immune system, a variety of drug therapy, exposure to a diagnostic and therapeutic procedure and frequent hospitalizations. **Objectives:** To analyze the prevalence of comorbidity in a patient with the staphylococcal bacteremia/sepsis according to the diagnosis, the site of infection and according to the isolated agent. **Patients and methods:** We analyzed the patients affected by the staphylococcal bacteremia/sepsis and treated in the Clinic for Infectious Diseases during a ten-year period. **Results:** 87 patients were included, out of whom 20 (23%) with clinical signs of the bacteremia and 67 (77%) of sepsis. In the analyzed sample, in 36 (41.4%) were not registered comorbidity. Hospital infections are represented by the previous antibiotic, corticosteroid and chemo therapy, pressure ulcers, and different implants. In all comorbidity, the most common isolated bacteria was *S. aureus* primarily strain MSSA followed by MRSA strain which is more frequent in patients who were surgically treated (comorbidity-various implants). **Conclusion:** The results suggest the importance of being mindful of the staphylococcal etiology of the bacteremia/sepsis in patients with comorbidities due to the selection of an adequate initial empirical therapy and reducing the risks of the septic shock.

Key words: staphylococcal bacteremia/sepsis, comorbidity.

1. INTRODUCTION

Epidemiology, clinical spectrum and outcome of the staphylococcal bacteremia/sepsis has been modified for years by different factors. In the era of antibiotic clinical course and outcome of this disease is significantly changed. Various studies have proven that the percentage of mortality is still up to 35% in some countries and it is associated with the acute renal failure, respiratory distress, shock and endocarditis (1, 2). Considering the fact that the *Staphylococcus aureus* bacteremia/sepsis is one of the most serious bacterial infection around the world, its importance is well recognized in developed countries and during the past years much effort was made in monitoring and prevention, especially infections caused by meticillin resistant strains (3, 4).

2. PATIENTS AND METHODS

The study included 87 patients, out of whom 57,5% (50) were men and 42.5% (37) women, age less than one to eighty years. All patients were hospitalized in the Clinic for Infectious Diseases of the Clinical Center of the Uni-

versity of Sarajevo during the period from 01.01.2000. to 01.10.2011.

3. RESULTS

In a community acquired sepsis without comorbidity were 22 patients, with one were 19, and with two 4 patients. In the study group of patients with hospital originated sepsis without comorbidity were 8 patients, with one comorbidity 5, with two 4 and per 1 patients with four and five pre-existing diseases.

The results of the analyzed group of patients with bacteremia showed that the group with outpatient originated infection have a slightly larger number of patients (6) with one comorbidity compared to patients without comorbidity (4), while in the hospital occurred bacteremia the largest number of patients (4) had two comorbidity and (2) patients one and three, while (2) patients had no comorbidity.

Comorbidity related to disease and conditions specified in the table, which existed together with infection *S. aureus/S. epidermidis* or it is preceded, was registered

Comorbidity	Total	Sepsis	Bacteremia	Hospital inf.	Outpatient inf.	MSSA	MSSE	MRSA	MRSE
Diabetes mellitus	16	5	11	7	9	8	1	5	2
Skin diseases	2	0	2	1	1	2	0	0	0
Systemic diseases	2	1	1	1	1	1	0	1	0
Neurological diseases	12	4	8	5	7	7	1	3	1
Malignant diseases	3	1	2	1	2	2	0	1	0
Antibiotic, Corticosteroid, chemo therapy	16	6	10	13	3	7	2	5	2
Trauma	9	1	8	4	5	5	1	3	0
Pressure ulcers	8	1	7	5	3	4	0	2	2
Damage to the natural heart valves	2	0	2	1	1	1	1	0	0
Artificial heart valves	1	0	1	1	0	1	0	0	0
Various implants	9	3	6	8	1	2	1	5	1

Table 1. Types of diagnosed disease in comorbidity in patients with a diagnosis of bacteremia/sepsis, patients with hospital and outpatient place of infection, to the isolated strain of *S.aureus/S.epidermidis* from blood culture

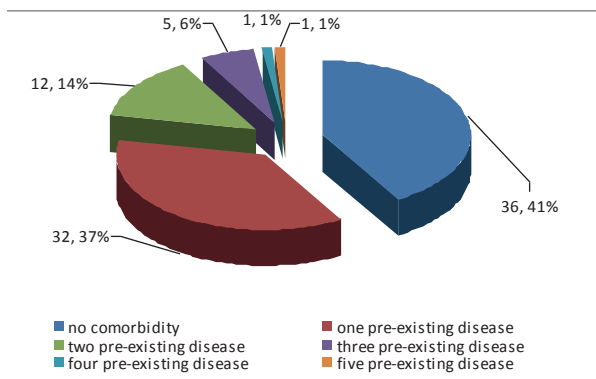


Figure 1. Percentage of comorbidity in patients with the staphylococcal bacteremia/ sepsis

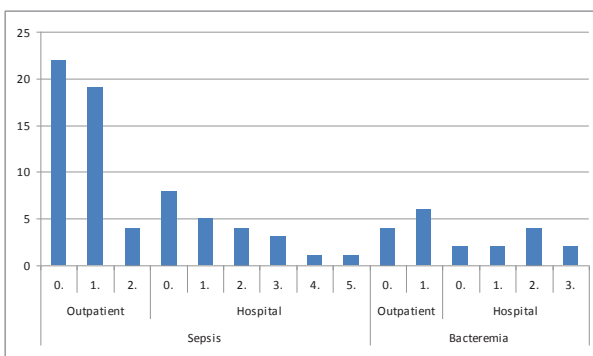


Figure 2. Histogram of frequency associated diseases (comorbidity) in relation to the place of origin (hospital/outpatient) and diagnosis (sepsis/bacteremia) (0-no comorbidity, 1-one disease ...)

in 51 of 87 patients, provided that for some patients at the same time noted two or more diseases/conditions. From the data in the table can be seen that the different diseases or conditions are variously associated with the investigated subcategories (bacteremia/sepsis, hospital/outpatient infection, different strains of *S.aureus/S.epidermidis*). So for all the investigated comorbidities more frequent was staphylococcal bacteremia rather than staphylococcal sepsis. Outpatient staphylococcal infections are more common in diabetes mellitus, neurological diseases malignant disease, and hospital infection are

represented by the previous antibiotic, corticosteroid and chemo therapy, pressure ulcers, and different implants, while the number of patients for the other comorbidities more or less equally distributed between subcategories of hospital and outpatient infections. In all comorbidity most commonly was isolated *S. aureus* primarily strain MSSA followed by MRSA strain which is more frequent in patients who were surgically treated (comorbidity-various implants).

4. DISCUSSION

Staphylococci primarily the *S. aureus* and *S. epidermidis*, are one of the most virulent human pathogens with the possibility of colonization and infection in hospitalized patients with compromised defense capabilities or without, as well as healthy immunocompetent persons in the outpatient setting. In individuals with pre-existing diseases is always an increased risk for occurrence of infections because of damaged immune system, different drug therapies, exposure to diagnostic and therapeutic procedure and more frequent hospitalizations (5,6). Studies Yamada and colleagues (7) and Kempkera and colleagues (8) show that the most common comorbidity associated with staphylococcal infections are malignant diseases, cardiovascular diseases, diabetes mellitus, immunosuppression and in recent years HIV infection. In a study Laupland and colleagues (9) the greatest risk of developing staphylococcal infections were registered in patients on hemodialysis, with transplanted organs, HIV infection, cancer and diabetes. In our study, 58,6% patients have a comorbidity, which corresponds with data from the literature where the staphylococcal infection is usually expected in patients with comorbidity. In the majority of patients 36,8% was found one pre-existing disease. The most common comorbidity registered in our study are consistent with those from the literature. Following methicillin sensitivity was noted that methicillin sensitive strains were represented in the higher percentage compared to methicillin resistant strains which does not mean that the methicillin-sensitive strains are more pathogen but because in our study was greater representation of this strain in the total number of tested samples.

5. CONCLUSION

The results show that patients with comorbidity have a higher prevalence to become sick with the bacteremia/sepsis, especially in hospital settings which suggests the importance of being mindful of the staphylococcal etiology of the bacteremia/sepsis in patients with comorbidities due to the selection of an adequate initial empirical therapy and reducing the risks of the septic shock.

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