

Prediction of Sepsis in Burn Disease

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Abstract The main complications of burn injuries include burn sepsis: this complication develops in 10-43% of severely burned patients and is considered the main cause of death (mortality is 70% or higher). The problem of sepsis is difficult to overestimate. Unfortunately, over the past few decades, there has been only a moderate improvement in the survival rate of patients suffering from sepsis. The currently existing prognostic systems for the development of a septic condition in burn disease are very difficult to use and insufficiently reliable. In the conditions of strict economic control over the issues of providing medical care to patients, there is a need for a system of reliable prediction of severe complications.

Keywords Burn disease, Sepsis, Shock, Multiple organ failure

1. Introduction

Burn disease is accompanied by multiple complications, such as respiratory distress syndrome, acute cardiovascular insufficiency, hypermetabolic syndrome with pronounced catabolism, ulcerative lesions of the stomach and intestines, DIC syndrome, etc., contributing to microbial translocation in the intestine and in the foci of infection. But the most serious complication is sepsis, which can lead to the development of multiple organ failure [1,2]. Sepsis is defined as “a life-threatening organ dysfunction caused by a violation of the regulation of the body's response to infection.” Sepsis and multiple organ failure are the main causes of death in patients with burns, but most clinical studies of sepsis exclude burns. The reason for the exclusion is that sepsis found in patients with burns differs from the clinical course of sepsis of a different etiology. Severe burn injury results in substantial damage to the skin, inhibiting its ability to perform as the primary barrier to infection. Additionally, severe burn injury can lead to critical illness and extensive time in the intensive care unit. These two factors work to increase the risk of sepsis in the burn patient compared with other hospitalized patients. The increased risk of sepsis is compounded by the difficulty of diagnosing sepsis in severely burned patients because the pathophysiology of large burns mimics sepsis, leading to possible delay in diagnosis and initiation of treatment. [3,4]. Measures have been taken to determine sepsis, septic shock and infection in patients with burns, but there is a constant need for revision.

The available sepsis prognostic systems (SOFA, SAPS, ISS, etc.) are cumbersome and difficult to use, so in practice,

simple and abbreviated prediction formulas from 4-5 criteria are most often used [5].

2. The Purpose of the Research

Obtaining quantitative criteria for the risk of developing multiple organ failure in patients with burn sepsis.

3. Materials and Methods of the Research

An open prospective and retrospective study of clinical material was examined using statistical and analytical methods of examination and treatment of 130 patients with burn sepsis and at risk of developing burn sepsis hospitalized in the Republican Scientific Center of Emergency Medical Care of the Samarkand branch in the period from 2017 to 2020. Burn sepsis was diagnosed in 80 (61.5%) patients due to the presence of systemic inflammatory reaction syndrome, and 90% of them developed severe sepsis with multiple organ failure. Multiple organ failure also occurred in 19% of patients who did not have a diagnosis of sepsis, since the number of signs of systemic inflammatory reaction syndrome in them exceeded 1 all the time of the disease, all of them were over 60 years old. Multiple organ failure was accompanied by a 45% mortality rate. As an additional indicator, the serum albumin concentration was used, the value of which demonstrates a negative correlation with the number of signs of systemic inflammatory reaction syndrome in patients.

4. Research Results

The study showed that the risk of developing multiple organ failure does not show a significant dependence on the gender of patients and depends on their age, the severity of the systemic inflammatory reaction syndrome and the degree of decrease in serum albumin. In addition, the elderly and senile age is characterized by a lower degree of severity of signs of systemic inflammatory reaction syndrome, despite more severe sepsis and, at the same time, lower albumin concentrations. Cases of multiple organ failure were characterized by an inadequate decrease in albumin even with a small number of signs of systemic inflammatory reaction syndrome. According to the probability of developing multiple organ failure, 3 risk categories were identified.

1st category - there is no risk of developing multiple organ failure in patients with burn sepsis (0%), only if there are no signs of systemic inflammatory reaction syndrome throughout the disease.

2nd category – there is an average risk of developing multiple organ failure if 1-2 signs of systemic inflammatory reaction syndrome are registered during the disease and the albumin concentration exceeds 20 g / l.

3rd category – there is an absolute (100%) risk of developing multiple organ failure if 3-4 signs of a systemic inflammatory reaction syndrome are registered, as well as if, in the presence of 1-2 signs of a systemic inflammatory reaction syndrome, an albumin concentration below 20 g / l occurs.

5. Conclusions

Sepsis in patients with burns has many differences from that in people without burns. All burn patients need careful monitoring as long as the wound remains open. Children with burns may have deeper effects, but aggressive therapy is justified. The obtained criteria can be used for timely selection of adequate treatment tactics for patients with burn sepsis.

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