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STUDY OF VARIOUS RISK FACTORS AND SYSTEMS INVOLVED IN SEPTICEMIA

General Medicine

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ABSTRACT

Sepsis is body's response to an infection. Sepsis cause danger to life. Sepsis occurs due to dysregulated immune response toward infection which leads to septic shock and through this multiple organ failure and leads to death. In most case of sepsis, medical professional recognises sepsis somehow delay which cause increase morbidity and mortality. In this study, we include various risk factors and various systems of body involved in septicemia which could be useful to early identification of septicemia lead to early treatment and by this decrease morbidity and mortality.

KEYWORDS

Sepsis, co morbidity diabetes mellites, chronic kidney disease, malignancy, various system of body

BACKGROUND

Sepsis is a dysregulated immune response to infection affecting millions of individuals per year and carries high morbidity and mortality rates even if appropriate care is provided.

Sepsis is a serious condition in which the body responds improperly to an infection. This type of immune response may lead to multiple organ failure.

Sepsis may complicate to septic shock in which decrease in blood pressure that can damage the lungs, kidneys, liver and other organs. When the damage is severe, it can lead to death.

Early treatment of sepsis improves chances for survival.

Aetiology

Sepsis can arise from both community-acquired and hospital-acquired infections. Of these infections, pneumonia is the most common source, next most common are intraabdominal and genitourinary infections. Blood cultures are typically positive in only one-third of cases, while many cases are culture negative at all sites. According to Extended Prevalence of Infection in Intensive care (EPIC II) Study, Staphylococcus aureus and Streptococcus pneumoniae are the most common gram-positive isolates, while Escherichia coli, Klebsiella species, and Pseudomonas aeruginosa are the most common gram-negative isolates. In recent years, gram-positive infections have been reported more often than gram-negative infections, yet a 75-country point-prevalence study of 14,000 patients on intensive care units (ICUs) found that 62% of positive isolates were gram-negative bacteria, 47% were gram-positive bacteria, and 19% were fungi.

Common risk factors for increased risk of infection include chronic diseases (e.g., HIV infection, chronic obstructive pulmonary disease, cancers, Diabetes Mellitus) and immunosuppression, extremes of age.

Pathogenesis

The early phase of sepsis characterized by excessive inflammation may be followed by a prolonged period of decrease functioning of immune system.

Microbial Factors

Bacterial virulence factors, named as glycocalyx and various adhesins, responsible for colonization, immune evasion, and establishment of disease in the host. Sepsis caused by gram-negative bacteria is thought to be largely due to a response by the host to the lipid A component of lipopolysaccharide, also called endotoxin. Sepsis caused by gram-positive bacteria may result from an immunological response to cell wall lipoteichoic acid. Bacterial exotoxins that act as superantigens also may cause sepsis. Sepsis cause by virus and fungi and even parasites.

Host Factors

Upon detection of microbial, the host systemic immune system is activated. Immune cells not only recognise pathogen-associated molecular patterns but also damage-associated molecular patterns from damaged tissues. An uncontrolled immune response is then activated because leukocytes are not recruited to the specific site of infection, but instead they are recruited all over the body. Then, an immunosuppression state ensues when the proinflammatory T helper cell 1 (TH1) is shifted to TH2, mediated by interleukin 10, which is known as "compensatory anti-inflammatory response syndrome". The apoptosis (cell death) of lymphocytes further worsens immunosuppression. Neutrophils, monocytes, macrophages, dendritic cells, CD4+ T cells, and B cells all undergo apoptosis, whereas regulatory T cells are more apoptosis resistant. Subsequently, multiple organ failure ensues because tissues are unable to use oxygen efficiently due to inhibition of cytochrome c oxidase.

Inclusion Criteria

Age >=to 15 years
Leucocytosis
Leukopenia
Culture positive case for bacteria

Exclusion Criteria

Age below 15 years
Culture Negative case
Fungal KOH positive case

Method

From 1st June 2023 to 31st August, 50 cases of septicemia patients have been admitted in civil hospital Rajkot.

In this study we have taken 50 septic patients and examined them and looked for various risk factors and which system involved in them.

Associated Risk Factors In Septicemia Patients

Co morbid condition	Number of patients
diabetes mellitus	37
chronic kidney disease	07
PLHA (Patient Leaving with HIV AIDS)	06
Hypertension	02
Malignancy	04
without comorbidity	05

In this study, patient who has comorbid condition like DM, CKD, HTN, Malignancy had more developed septicemia. Even older age patient had developed septicemia.

Association Between Age And Number Of Patients

Age group (In years)	Number of patients
15 to 35	2
36 to 55	11
56 to 75	31
above 75	6

Associated System Involved In Septicemia Patients

System involved	Number of patients
LRTI (Respiratory system)	30
UTI (genitourinary system)	12
CVS (cardiovascular system)	02
CNS (Central Nervous System)	03
Local wound	04

CONCLUSION

From this study, we can conclude that there are more chances to develop septicemia in patients with co morbidity like diabetes, CKD, PLHA than patients without co morbidity. From this conclusion we should give more attention and early treatment to these patients to prevent complication of septicemia.

According to study, patient with diabetes has more chances to get infection and develop septicemia.

From 50 patients, 37 patients were diabetic.
From 50 patients,7 patients suffered from chronic kidney disease.
From 50 patients,6 patients leaving with HIV AIDS.
From 50 patient,4 patients have malignancy.
From 50 patient,2 patients have hypertension.
From 50 patient,5 patients were without any co morbidity.

In this study, with comorbidity we find older age patient had developed septicemia more.

There were four age groups. From 50 patients,31 patient came under 56 years to 75 years,11 patient came under 36 years to 55 years,02 patient came under 15 years to 35 years and 6 patients were above 75 years.

In this study most common system involved in septicemia patient is Respiratory system and then Genito-urinary system.

From 50 patients,30 patients had symptom of Lower Respiratory Tract Infection.
From 50 patients,12 patients had symptom of urinary tract infection.
From 50 patients,04 patients develop local site infection.
From 50 patients,03 patients has central nervous system infection and 02 patients had CVS infection.