

Editorial

Sepsis and Septic shock: A Global Challenge for the Physicians

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Sepsis is a medical emergency that describes the systemic immunological response to an infectious process, that ultimately leading to multi-organ failure. Now a days it has become a global burden. Despite significant improvement in the understanding of its pathophysiology and clinical syndrome, advancement in the management of sepsis and septic shock remain one of the major causes of morbidity and mortality in critically ill patient.¹

The global burden of sepsis is difficult to ascertain, although some recent scientific papers admitted that about 40 million cases of sepsis occur globally each year and 20% of all deaths are resulting from sepsis including children under five. There are significant discrepancies in sepsis incidence and death regionally. About 85% of sepsis incidence and death occurs in low- and middle-income countries worldwide.² Accurate data for sepsis incidence and death in Bangladesh is yet not available. Respiratory tract infections, UTI, abdominal infections, immunocompromised host infection are the major causes of Sepsis in Bangladesh.³

About 80% of the hospital treated sepsis cases arise in the community, 20% is hospital acquired. Routine screening targeting early diagnosis and commencing early treatment can reduce the number of deaths. A study shows relative death risk increased by 4-8% for every hour delay in starting appropriate antibiotic.⁵

Sepsis survivors who can able to return home or work may require ongoing nursing care. Cognitive impairment and functional disability are the major consequences.⁴ Sepsis is the principal cause of readmission after discharge up to 26% cases.⁶

The upregulation of pro and anti-inflammatory pathway leads to systemic wide release of cytokines like IL-2, IL-6 and TNF, mediators and pathogens like molecules, resulting in activation of coagulation cascades via tissue factor, factor-VII, reduced protein C & S and complement system. Both macro and micro vascular events occur leading to organ damage like cardiomyopathy, ARDS, acute kidney failure, and neurological complications. Additional manifestation occurs like paralytic ileus, elevated ALT, altered glycemic control, thrombocytopenia and DIC, adrenal insufficiency and sick euthyroid syndrome.

The major pathogens are bacteria specially group B streptococci, MRSA and E.Coli. Viral and Fungal infection also cause sepsis, that are clinically indistinguishable from bacterial one. In the recent years SARS COV-2 virus causing COVID-19 infection is characterized by MOF resulting from secondary host response considered as full-fledged sepsis. COVID-19 is responsible for about 6 million deaths worldwide and cause of significant morbidity. Noninfectious process such as acute pancreatitis, burn, trauma, major surgery, drug reaction can produce alarmins and can initiate the process of inflammation with host immune response mimicking sepsis.

Early diagnosis and recognition of sepsis helps in reducing mortality and morbidity. CBC, CRP, Blood culture, and culture of other body fluids, Serum lactate and imaging remain the key investigation. Serum procalcitonin became an important biomarker for sepsis for last two decades though its physiological role yet not been established.⁸ Newer diagnostic biomarkers like presepsin, proadrenomodulin, Galactomannan and beta-D-glucan, Cytokines such as interleukins (eg, IL-6, IL-8, IL-10) are under trial as these molecules rise during bloodstream infection may help in early diagnosis of sepsis.⁹

Treatment of sepsis is a daunting task. Fluid resuscitation, prompt use of judicious broad-spectrum antibiotics,

restoration of blood pressure by using vasopressor, corticosteroids are the cornerstone of sepsis management. Treating sepsis with vitamin C, vitamin D, Zinc, probiotics are showing great interest currently.¹⁴ Immunomodulating drugs like anti cytokine antibody, tocilizumab, sarilumab and anakinra shown promising results during COVID-19. Personalized medication for sepsis management is a new era.¹ Extracorporeal blood perfusion therapy is another new concept, to remove both inflammatory mediators and bacterial toxins from blood, still there is lack of evidence for their efficacy in the treatment of sepsis.¹²

As an ancient threat to human health, management of sepsis and septic shock remain as a challenge. Countries like Bangladesh where health care system is low resource setting, the challenge is more. Several factors including the lack of facility for early diagnosis as well as management, injudicious use of antibiotics and antimicrobial resistance, rampageous use of corticosteroids, environmental factors like warm moist weather, overcrowded population, unhygienic behavior of people, make the task more difficult.

For the last few decades there are significant improvement in the diagnosis and management of sepsis, still there are areas for research due to the diversity of the disease. Newer concepts are under trial for early diagnosis and effective management of sepsis, to reduce the mortality and morbidity, it remains the global threat for the physicians.

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