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Strategies for the detection, treatment and management of sepsis

Maannashon Prabaharan
King's College London, UK

Sepsis is caused by the host's over-response to an infection, which leads to organ failure. This affects many areas of the body, including the cardiovascular, renal, GI and pulmonary systems. Sepsis has high mortality rates, with survivors being affected by complications, including cognitive decline and increased cardiovascular events.

Current methods for diagnosing sepsis include the use of physical biomarkers such as heart rate (HR), and serological biomarkers such as C-Reactive Protein (CRP) and Procalcitonin (PCT). Clinical trials were found through literature searches using the PubMed and Ovid databases. The cumulative evidence suggests that other serological biomarkers such as presepsin, Pentraxin-3 (PTX3) and micro-RNA have potential for future clinical use. Heart rate variability (HRV) is a newer physical biomarker that has good evidence for diagnosing sepsis patients.

The Surviving Sepsis Campaign has annual updates on guidelines for clinicians in treating sepsis. The latest guidelines have included the empirical use of broad-spectrum antimicrobials to be given immediately, as part of a '1-hour bundle', which does have disadvantages. The growing evidence suggests of a trend in increasing antimicrobial resistance, therefore, new alternatives should be found. This text has evidence for alternative methods, such as the use of antimicrobial stewardship (responsible use of antibiotics) and bacteriophages (viruses which infect and destroy bacteria).

Recent innovations in technology over the past decade have been integrated into clinical practice, and there is great hope for the near future with new research into predictive algorithms and consumer technology in treating patients.

This review aims to summarise the current developments that have occurred in the diagnosis, treatment and management of septic patients. This review also aims to show the reader what future developments hold for improving the quality of sepsis management.

Recent Publications:

1. Koch, A., Nilsen, R., Eriksen, H., Cox, R. and Harthug, S. (2015). Mortality related to hospital-associated infections in a tertiary hospital; repeated cross-sectional studies between 2004-2011. Antimicrobial Resistance and Infection Control, 4(57).
2. Jurač, K., Nabergoj, D. and Podgornik, A. (2018). Bacteriophage production processes. Applied Microbiology and Biotechnology. In press.
3. Wu, X., Yang, J., Yu, L. and Long, D. (2018). Plasma miRNA-223 correlates with risk, inflammatory markers as well as prognosis in sepsis patients. Medicine, 97(27), p.e11352
4. Liu, Y., Yu, M., Shou, S. and Chai, Y. (2017). Sepsis-Induced Cardiomyopathy: Mechanisms and Treatments. Frontiers in Immunology, 8, pp.1-8.

Biography

Maannashon Prabaharan is an intercalating student who has interests in Pharmacology, and its uses in clinical practice. This paper vocalizes his opinions about the current clinical scenario regarding sepsis (Levy et al. 2018), and potential future changes that could be implemented in all aspects of clinical care.