

In this article...

- Prevalence and burden of post-sepsis syndrome
- Physical and psychological symptoms of post-sepsis syndrome
- Role of nurses in the care of sepsis survivors

Post-sepsis syndrome: overview of a relatively new diagnosis



Nursing Times
Journal Club

Key points

Sepsis is a life-threatening condition arising from a dysregulated response to an infection

Post-sepsis syndrome is a collection of symptoms that many survivors of sepsis develop

Symptoms include fatigue, reduced muscle strength, anxiety and depression

At the point of discharge, patients need to receive clear information on the problems they may face

More research is needed on this relatively new diagnosis

Author Verity Sangan is compliance and special projects manager, LV Care Group, St Helier, Jersey.

Abstract Sepsis is a life-threatening condition arising from a dysregulated response to an infection. Many survivors experience a range of physical and psychological symptoms collectively known as post-sepsis syndrome. The effects of post-sepsis syndrome vary but can be devastating and life altering. Health professionals, particularly nurses, need to ensure that sepsis survivors are given appropriate information and that appropriate referrals are made upon discharge, so they can access help should they develop post-sepsis syndrome.

Citation Sangan V (2019) Post-sepsis syndrome: overview of a relatively new diagnosis. *Nursing Times* [online]; 115: 8, 19-21.

Sepsis is a life-threatening organ dysfunction caused by the human body's dysregulated response to an infection (Singer et al, 2016). Essentially, the body does not only attack the infection as per the normal immune response, but also begins to attack its own organs and tissues.

Sepsis, which has been deemed a global health priority by the World Health Organization (WHO, 2017), can further develop into septic shock. This is a subset condition in which circulatory and metabolic responses increase mortality rates; it is characterised by persistent hypotension and a raised lactate level (Singer et al, 2016). Box 1 gives definitions of both sepsis and septic shock.

Post-sepsis syndrome is the name given to a collection of symptoms that people may develop after sepsis, which vary in severity and have both personal and economic consequences. This article looks at the burden of post-sepsis syndrome in adults and children, explores its physical and psychological effects, and discusses nurses' responsibilities towards patients and families.

Burden

Post-sepsis syndrome is widespread; at least one in six sepsis survivors have severe and persistent impairments, which include at least one new functional limitation on their activities of daily living (Prescott and Angus, 2018). One study of sepsis survivors found that physical and cognitive decline in their health was still evident at least eight years after discharge from hospital (Iwashyna et al, 2010).

In general, the physical effects of post-sepsis syndrome are more prevalent than the psychological effects (Hofhuis et al, 2008). The areas in which sepsis survivors differ most from the general population are physical health, mental health and vitality (Hofhuis et al, 2008).

Studies have shown that up to 40% of people who are discharged from hospital after having sepsis will die within two years and at least 60% will be readmitted within one year (Prescott and Angus, 2018; Thompson et al, 2018; Shankar-Hari and Rubenfeld, 2016). Moreover, two years after discharge, survivors of sepsis had higher healthcare costs than other patients who had experienced critical illness (Thompson

Box 1. Definitions of sepsis and septic shock

Sepsis

Sepsis is defined by the concomitant presence of:

- Suspected infection
- Minimum of two points acquired through Sequential Organ Failure Assessment (SOFA) scoring

Septic shock

Septic shock is defined by the concomitant presence of:

- Mean arterial pressure of >65, requiring vasopressors to maintain
- Serum lactate level of >2mmol despite fluid resuscitation

Source: Singer et al (2016)

Box 2. Common symptoms of post-sepsis syndrome

- Lethargy/excessive tiredness
- Poor mobility/muscle weakness
- Breathlessness/chest pains
- Swollen limbs (excessive fluid in the tissues)
- Joint and muscle pains
- Anxiety/fear of sepsis recurring
- Depression
- Insomnia (due to stress or anxiety)
- Post-traumatic stress disorder

Source: UK Sepsis Trust (2019)

et al, 2018). Inpatient costs of treating sepsis account for only around 30% of the total cost of sepsis, as out-of-hospital healthcare and lost productivity cost far more than is generally acknowledged (Tiru et al, 2015).

Physical effects

The physical effects of post-sepsis syndrome can be devastating and patients may not be able to return to work as quickly as they had anticipated; this can have huge consequences for personal and family life, as well as posing a financial cost to society.

The effects vary between individuals – sometimes quite dramatically. Some will experience hidden physical effects, such as increased fatigue or lethargy. Others will develop more-obvious physical effects, such as reduced muscle strength, which could lead to muscle wasting and functional disability (Chao et al, 2014).

Hidden physical effects such as acute renal failure may be harder to spot and, therefore, more difficult to monitor. Acute renal failure and an acceleration of the progression of pre-existing conditions are common physical effects of post-sepsis syndrome; discharged patients need to be aware of this so they can monitor symptoms and know to seek help as necessary (Prescott and Angus, 2018; Elfeky et al, 2017).

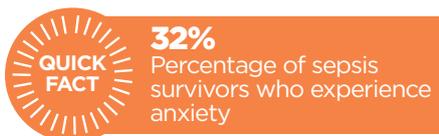
Survivors of sepsis are also at risk from developing complications such as diabetes and cardiovascular diseases (Shankar-Hari and Rubinfeld, 2016).

It is impractical to equip survivors with detailed knowledge of every physical symptom they may or may not develop after surviving sepsis; however, patients, relatives and carers should be made aware of who to contact if the survivor starts experiencing symptoms about which they are concerned. Box 2 lists common symptoms of post-sepsis syndrome.

Psychological effects

The psychological effects of post-sepsis syndrome often go unseen, but they have the potential to be incredibly debilitating. Survivors of sepsis have been found to be at increased risk of:

- Developing anxiety and depression;
- Experiencing fatigue and problems with sleep (Huang et al, 2018).



In one study, anxiety was present in as many as 32% of sepsis survivors, while depression was present in 29%; those who developed mental health complications often found these to be a persistent problem in everyday life one year after discharge. Furthermore, the study found that 44% of sepsis survivors are likely to develop post-traumatic stress disorder (Prescott and Angus, 2018).

Female hospital inpatients have been found to be more likely to die as a result of sepsis than their male counterparts (Elfeky et al, 2017); this suggests there may be a greater proportion of male survivors of sepsis than female. It is generally acknowledged that men are less likely than women to seek support for mental health problems, so it may be even more relevant to ensure that men who survive sepsis are given information on the mental health issues they may develop in the months and years after discharge.

Post-sepsis syndrome in children

Sepsis is one of the top 10 killers of children and adolescents globally. Children under one year of age and those with conditions such as cancer are more susceptible to developing sepsis than their peers (WHO, 2018). Those who survive can also develop post-sepsis syndrome.

In infants, symptoms of post-sepsis syndrome may not be spotted until they reach school age and find themselves academically behind their peers, or until it appears that they are not developing normally (Als et al, 2013). Als et al (2013) also found that children with post-sepsis syndrome were more likely to have shorter attention spans, poorer memory and, consequently, lower IQs.

A small study that followed children for up to four years after sepsis found that:

- Their cognitive function was lower than average;
- They were slightly more likely to attend special education schools instead of entering mainstream education (Bronner et al, 2009).

Implications for practice

Research has found significant gaps in knowledge about sepsis among paramedics, nurses and doctors; however, that gap is reducing (Matthaeus-Kraemer et al, 2016; Yealy et al, 2015). Research has also demonstrated that large portions of the general public have an awareness of sepsis, but do not know about its potential after-effects (Huang et al, 2018).

A 10-year Taiwanese study found improved survival rates among those people who received rehabilitation therapies after a stay in the intensive care unit (ICU) for sepsis compared with those who did not receive such therapies (Chao et al, 2014). This clearly demonstrates that patients have not necessarily 'recovered' just because they are considered medically fit for discharge.

It is not obvious which patients will go on to develop post-sepsis syndrome; therefore, upon discharge, nurses should consider referring sepsis survivors to rehabilitation therapies such as physiotherapy and occupational therapy, for relevant follow-up. The outcomes for patients leaving

Clinical Practice Review



Referral to physiotherapist should be considered for survivors of sepsis

critical care is, after all, determined as much by follow-up care as by that delivered in the critical care setting (Bion, 2012).

Sepsis is the most common non-cardiac reason for ICU admission (Holland and Moss, 2017) so ICU nurses in particular have a responsibility to ensure that relevant and accessible information, and advice are provided to patients and their families upon discharge. Patients need to be given:

- Realistic expectations about whether, and how quickly, they can expect to return to their previous level of functioning;
- Information about support services and relevant therapies.

As some patients will be discharged from non-ICU settings, appropriate discharge advice must be available in all areas (Johns et al, 2010).

When the patient is a child, nurses need to be attentive to the support needs of

parents, as they – particularly mothers – can experience emotional strain as a result of their child having sepsis and/or being hospitalised in intensive care (Buysse et al, 2008).

After discharge, a multidisciplinary approach is needed to support patients who may be experiencing symptoms of post-sepsis syndrome. The role of nurses in community and primary care could include ensuring patients have access to the services that are relevant to their needs. This may include the involvement of their GP, allied health professionals or mental health services.

“It is not obvious which patients will go on to develop post-sepsis syndrome”

Conclusion

There is limited research on post-sepsis syndrome, its prevalence, signs and symptoms, treatment and care. Further research is required to gain more statistical information on the prevalence of the syndrome in different patient demographics, draw a more definitive list of symptoms experienced by sepsis survivors, and determine how best to educate health professionals on post-sepsis syndrome information delivery and management. Furthermore, there is scope for further research to investigate the risk factors that may indicate which patients are more likely to develop post-sepsis syndrome and to what severity.

In the meantime, it remains the responsibility of all health professionals, particularly nurses and those working in primary care, to increase their knowledge of post-sepsis syndrome so they can better support sepsis survivors and their families. Nurse educators and providers of sepsis education and training should seek to include information about post-sepsis syndrome in their training programmes to raise the profile of the condition. Support for survivors and information leaflets are available through organisations such as the UK Sepsis Trust (sepsistrust.org), which healthcare organisations could use while further work is carried out on this relatively new diagnosis. **NT**

References

- Als LC et al (2013) Neuropsychologic function three to six months following admission to the PICU with meningoencephalitis, sepsis, and other disorders: a prospective study of school-aged children. *Critical Care Medicine*; 41: 4, 1094-1103.
- Bion J (2012) Surviving sepsis: a systems issue. *The Lancet Infectious Diseases*; 12: 12, 898-899.
- Bronner MB et al (2009) An explorative study on

- quality of life and psychological and cognitive function in pediatric survivors of septic shock. *Pediatric Critical Care Medicine*; 10: 6, 636-642.
- Buysse CM et al (2008) Surviving meningococcal septic shock: health consequences and quality of life in children and their parents up to 2 years after pediatric intensive care unit discharge. *Critical Care Medicine*; 36: 2, 596-602.
- Chao PW et al (2014) Association of postdischarge rehabilitation with mortality in intensive care unit survivors of sepsis. *American Journal of Respiratory and Critical Care Medicine*; 190: 9, 1003-1011.
- Elfeky S et al (2017) The epidemiologic characteristics, temporal trends, predictors of death, and discharge disposition in patients with a diagnosis of sepsis: a cross-sectional retrospective cohort study. *Journal of Critical Care*; 39: 48-55.
- Hofhuis JG et al (2008) The impact of severe sepsis on health-related quality of life: a long-term follow-up study. *Anesthesia and Analgesia*; 107: 6, 1957-1964.
- Holland EM, Moss TJ (2017) Acute noncardiovascular illness in the cardiac intensive care unit. *Journal of the American College of Cardiology*; 69: 16, 1999-2007.
- Huang CY et al (2018) Life after sepsis: an international survey of survivors to understand the post-sepsis syndrome. *International Journal for Quality in Health Care*; 31: 3, 191-198.
- Iwashyna TJ et al (2010) Long-term cognitive impairment and functional disability among survivors of severe sepsis. *Journal of the American Medical Association*; 304: 16, 1787-1794.
- Johns RH et al (2010) Considerations and proposals for the management of patients after prolonged intensive care unit admission. *Postgraduate Medical Journal*; 86: 1019, 541-551.
- Matthaeus-Kraemer CT et al (2016) Crossing the handover chasm: clinicians' perceptions of barriers to the early detection and timely management of severe sepsis and septic shock. *Journal of Critical Care*; 36: 85-91.
- Prescott HC, Angus DC (2018) Enhancing recovery from sepsis: a review. *Journal of the American Medical Association*; 319: 1, 62-75.
- Shankar-Hari M, Rubenfeld GD (2016) Understanding long-term outcomes following sepsis: implications and challenges. *Current Infectious Disease Reports*; 18: 11, 37.
- Singer M et al (2016) The third international consensus definitions for sepsis and septic shock (Sepsis-3). *Journal of the American Medical Association*; 315: 8, 801-810.
- Thompson K et al (2018) Health-related outcomes of critically ill patients with and without sepsis. *Intensive Care Medicine*; 44: 8, 1249-1257.
- Tiru B et al (2015) The economic and humanistic burden of severe sepsis. *Pharmacoeconomics*; 33: 9, 925-937.
- UK Sepsis Trust (2019) *Post Sepsis Syndrome*. Bit.ly/UKSTPost-Sepsis
- World Health Organization (2018) *Sepsis*. Bit.ly/WHOsepsisFacts
- World Health Organization (2017) *Improving the Prevention, Diagnosis and Clinical Management of Sepsis*. Bit.ly/WHOsepsis
- Yealy DM et al (2015) Recognizing and managing sepsis: what needs to be done? *BMC Medicine*; 13: 98.



Nursing Times
Journal Club
online

To use this article for a journal club discussion with colleagues, go to nursingtimes.net/NTJCpostsepsis and download the discussion handout. Your journal club activity counts as participatory CPD hours or can be used as the basis for reflective accounts in your revalidation activities.

For more Nursing Times Journal Club articles and tips on how to set up and run your own group, go to: nursingtimes.net/NTJournalClub



For more on this topic online

- Ensuring early recognition and treatment of sepsis and septic shock Bit.ly/NTSepsis