Children Who Survive Sepsis Often Experience Lingering Effects

Study at 2017 Pediatric Academic Societies Meeting in San Francisco suggests need for additional support after hospital discharge

SAN FRANCISCO – Survival rates have risen dramatically in recent years among children who develop sepsis, a severe, life-threatening immune reaction to an infection somewhere in the body. But new research being presented at the 2017 Pediatric Academic Societies Meeting shows that recovery remains a long haul for patients, with many still feeling effects on their physical, social, emotional and school functioning for months after they are discharged from the hospital.

Researchers will present the abstract, “Illness Severity Associated with Deterioration of Health-Related Quality of Life Following Pediatric Sepsis” on Monday, May 8, at the Moscone West Convention Center.

Lead author Elizabeth Killien, a pediatric critical care medicine fellow at the University of Washington School of Medicine, said that while it is increasingly rare for children to die from severe infections in the United States, the number of children experiencing sepsis actually is increasing.

“Although the number of children surviving sepsis is rising dramatically,” Killien said, “we know very little about what happens to these children after they’re released from the hospital.”

Reviewing electronic health records, the researchers identified 778 children admitted to Seattle Children’s Hospital between 2012 and 2015 who met the criteria for sepsis within four hours of arrival. They compared the patients’ reported, baseline health-related quality of life, a collection of factors that describe a child’s overall level of functional well-being, with similar measurements taken 2 weeks and 5 months after hospital discharge.
“What we found was that more than 23 percent, or nearly a quarter, of the patients hospitalized with sepsis have a significant decline in quality of life after hospitalization that can last several months after discharge,” Killien said.

Among factors that most strongly predicted failure to recover to baseline health-related quality of life, Dr. Killien said, was the severity of a patient’s sepsis. For example, fully 50 percent of patients who developed septic shock, in which blood pressure plunges and organ damage can occur, were still below their baseline functional health status nearly five months after discharge. An even higher amount (56 percent) of patients who had sepsis that involved infections in their blood also had failed to fully recover, as did 53 percent of those who had central nervous system infections.

Identifying which factors predict declines in quality of life, Dr. Killien said, can help the medical community recognize which children are most at risk for prolonged recovery.

“We’ve always focused on reducing deaths from pediatric sepsis, but it’s becoming increasingly clear that children who are surviving sepsis experience many lasting effects on their health and quality of life,” she said. “Knowing that sepsis can have such a significant impact on children’s long-term well-being can help us better support them during and after a hospitalization to help improve outcomes among survivors.”

Dr. Killien will present the abstract at 1:45 p.m.

Please note: only the abstract is being presented at the meeting. In some cases, the researcher may have more data available to share with media, or may be preparing a longer article for submission to a journal. Contact the researcher for more information.

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The Pediatric Academic Societies (PAS) Meeting brings together thousands of individuals united by a common mission: to improve child health and wellbeing worldwide. This international gathering includes pediatric researchers, leaders in academic pediatrics, experts in child health, and practitioners. The PAS Meeting is produced through a partnership of four organizations leading the advancement of pediatric research and child advocacy: Academic Pediatric Association, American Academy of Pediatrics, American Pediatric Society, and Society for Pediatric Research. For more information, visit the PAS Meeting online at www.pas-meeting.org, follow us on Twitter @PASMeeting and #pasm17, or like us on Facebook.

ABSTRACT
TITLE: Illness Severity Associated with Deterioration of Health-Related Quality of Life Following Pediatric Sepsis
Background: As mortality from pediatric sepsis has declined, the number of children surviving sepsis is rising dramatically. Little is known, however, about long-term morbidity among survivors. This investigation aimed to measure the incidence of and risk factors for deterioration of health-related quality of life (HRQL) following pediatric sepsis, hypothesizing that sepsis severity would be associated with a decline in HRQL.

Design/Methods: We conducted a retrospective cohort study of children admitted to Seattle Children's Hospital with community-acquired sepsis from 2012-2015 using electronic health records to identify patients meeting 2005 consensus sepsis criteria within 4 hours of presentation. We assessed HRQL with the PedsQL™ for pre-admission baseline and 0.5-5 month post-discharge status, and identified patients who failed to recover within 4.5 PedsQL™ points of their baseline (the minimally clinically significant difference). We determined associations between patient and illness characteristics and failure to recover (FR) from baseline to follow-up in univariate analyses and a multivariable generalized linear model, and determined mean difference in PedsQL™ using linear regression modeling.

Results: Failure to recover occurred in 23.4% of 778 included patients and persisted for up to 140 days post-discharge. Factors associated with FR included sepsis category (septic shock 50%, severe sepsis 30.3%, sepsis 21.9%, p=0.001), ICU admission (36.7%, p=0.003), site of infection (blood 55.6%, CNS 52.9%, p<0.001), immune compromise (39.6%, p<0.001), Pediatric Medical Complexity Algorithm category (complex chronic 30.3%, p=0.01), longer length of stay (LOS) (p<0.001, Fig1), and shorter time to follow-up (p=0.02, Fig2). In multivariable regression, FR was associated with septic shock (RR 1.64 [1.04-2.58]), CNS infection (RR 1.92 [1.13-3.24]), and immune compromise (RR 1.80 [1.35-2.41]). LOS was associated with FR among non-ICU patients only (RR 1.04/day [1.01-1.07]). Lower severity of illness as measured by MPEWS score 4-6 for non-ICU patients (RR 0.69 [0.50-0.95]) and PRISM <5 for ICU patients on linear regression (+1.09pts [0.002-2.17]) was protective.

Conclusion(s): Nearly one-quarter of children surviving community-acquired sepsis experience a clinically significant decline in HRQL persisting up to 4.5 months following hospital discharge. Identification of the potentially modifiable factors associated with HRQL deterioration is essential to guide interventions to improve long-term outcomes.