

Mortality and morbidity in community-acquired sepsis in European pediatric intensive care units: a prospective cohort study from the European Childhood Life-threatening Infectious Disease Study (EUCLIDS)

Navin P. Boeddha

Erasmus MC-Sophia Children's Hospital, Netherlands

Abstract

Sepsis is one of the main reasons for non-elective admission to pediatric intensive care units (PICUs), but little is known about determinants influencing outcome. We characterized children admitted with community-acquired sepsis to European PICUs and studied risk factors for mortality and disability.

This report, embedded in the EUCLIDS study, includes 795 children admitted with community-acquired sepsis to 52 PICUs from seven European countries between July 2012-January 2016. Primary outcome measure was in-hospital death. Secondary outcome measures were PICU-free days censored at day 28, hospital length of stay, and disability. Independent predictors were identified by multivariate regression analysis.

Patients most commonly presented clinically with sepsis without a source (n=278,35%), meningitis/encephalitis (n=182,23%), or pneumonia (n=149,19%). Of 428(54%) patients with confirmed bacterial infection, *Neisseria meningitidis* (n=131,31%) and *Streptococcus pneumoniae* (n=78,18%) were the main pathogens. Mortality was 6%(51/795), increasing to 10% in the presence of septic shock (45/466). Of the survivors, 31% were discharged with disability, including 24% of previously healthy children who survived with disability. Mortality and disability were independently associated with *S. pneumoniae* infections and illness severity as measured by Pediatric Index of Mortality (PIM2) score.

Despite widespread immunization campaigns, invasive bacterial disease remains responsible for substantial morbidity and mortality in critically ill children in high-income countries. Almost one third of sepsis survivors admitted to the PICU were discharged with some disability. More research is required to delineate the long-term outcome of pediatric sepsis and to identify interventional targets.

Biography:

Navin Boeddha (1987), originally from Suriname (South America), obtained his medical degree (2011) from the Erasmus MC, Rotterdam. In 2013, he commenced his PhD on severe bacterial infections in children, focusing on several inflammatory, hemostatic, genetic, and environmental factors associated with severity of sepsis. He was member of the EUCLIDS consortium, evaluating genetic determinants of susceptibility and/or severity in life-threatening bacterial infections of childhood. He obtained his PhD thesis in 2018. From 2017 onwards, Navin has been enrolled to the pediatrics residency programme of Erasmus MC. He aspires to combine clinical activities and research activities in his further career.

References:

1. Boeddha, Navin & Schlapbach, Luregn & Driessen, Gertjan & Herberg, Jethro & Rivero-Calle, Irene & Cebey-López, Miriam & Kohlfürst, Daniela & Philipsen, Ria & Groot, Ronald & Inwald, David & Nadel, Simon & Paulus, Stephane & Pinnock, Eleanor & Secka, Fatou & Anderson, Suzanne & Agbeko, Rachel & Berger, Christoph & Fink, Colin & Carrol, Enitan & Emonts, Marieke. (2018). Mortality and morbidity in community-acquired sepsis in European pediatric intensive care units: A prospective cohort study from the European Childhood Life-threatening Infectious Disease Study (EUCLIDS). *Critical Care*. 22. 10.1186/s13054-018-2052-7.
2. Hartman, Stan & Boeddha, Navin & Ekinici, Ebru & Koch, Birgit & Donders, Rogier & Hazelzet, Jan & Driessen, Gertjan & Wildt, Saskia. (2019). Target attainment of cefotaxime in critically ill children with meningococcal septic shock as a model for cefotaxime dosing in severe pediatric sepsis. *European journal of clinical microbiology & infectious diseases* : official publication of the European Society of Clinical Microbiology. 38. 10.1007/s10096-019-03535-w.
3. Willems, Esther & Alkema, Wynand & Keizer-Garritsen, Jenneke & Suppers, Anouk & Flier, Michiel & Philipsen, Ria & Heuvel, Lambert & Volokhina, Elena & Molen, Renate & Herberg, Jethro & Levin, Michael & Wright, Victoria & Ahout, Inge & Ferwerda, Gerben & Emonts, Marieke & Boeddha, Navin & Rivero-Calle, Irene & Torres, Federico & Wessels, Hans & Jonge, Marien. (2019). Biosynthetic homeostasis and resilience of the complement system in health and infectious disease. *EBioMedicine*. 45. 10.1016/j.ebiom.2019.06.008.