

Lack of health insurance and low socioeconomic status increase mortality in newborns

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Higher numbers of newborns die from sepsis if their families have low income or no health insurance. These factors may be used to flag pregnant women whose infants may benefit from early intervention to protect against sepsis. Findings from the first nationwide study to evaluate socioeconomic characteristics that influence neonatal mortality from sepsis were reported at the 2016 Clinical Congress of the American College of Surgeons (ACS).

Sepsis in the early days of life is the seventh leading cause of death among infants in the U.S., according to the National Center for Health Statistics.¹ Quick treatment is critical for saving the lives of [newborns](#) with the bloodstream infection. As many as 50 percent of newborns die and 15 to 30 percent incur damage to the nervous system if the condition is not treated promptly.²

Sepsis is difficult to diagnose in newborns. Signs and symptoms are not specific and standard vital sign measurements, such as temperature and white blood cell count, are not sensitive enough to identify at-risk newborns.³

Previous studies have defined [sepsis](#) in the general surgical population, provided screening tools to identify sepsis pre- and postoperatively, and traced the effect of demographic factors, such as race.⁴ However, few studies have investigated sepsis in newborns, and none have specifically

evaluated the relationship between socioeconomic factors and death in neonates, according to principal study author, Ravi S. Radhakrishnan, MD, FACS, an associate professor of surgery and pediatrics and the John Sealy Distinguished Chair in Clinical Research at the University of Texas Medical Branch (UTMB), Galveston.

"This nationwide study was done to determine whether sociodemographic factors may help us identify patients who are at high risk for sepsis so that we can intervene and improve outcomes," Dr. Radhakrishnan explained.

The researchers analyzed information from the Kid's Inpatient Database (KID), a nationwide survey of inpatient discharge data on patients younger than 21 years of age. KID includes clinical information about primary and secondary diagnoses, discharge status, demographics, total charges, and length of stay, as well as measures of disease severity and comorbidity. The UTMB investigators analyzed data from 3 million pediatric discharges over the course of the last three years for which data were available—2006, 2009, and 2012.

From that data set, the researchers identified 160,677 infants who developed sepsis within 28 days of birth. Records of these patients were reviewed to determine whether socioeconomic factors, such as the presence and type of [health insurance](#) status and income, were associated with mortality.

Investigators also included in their analysis the severity of illness and low birth weight, which have proved to increase the likelihood of mortality from sepsis for newborns in other studies.

The researchers identified specific groups of newborns with sepsis who had a higher rate of death. As expected, those who were severely ill and had a [low birth weight](#) were at the highest risk of death. The odds ratio

was as high as 36.1 for infants who were extremely ill, and it was 4.8 for infants who weighed less than 1500 g. at the time of their birth.

Unique to this study were the associations between mortality and insurance status and income. Infants whose families were categorized as self-pay patients had almost a three times greater risk of death from sepsis than families who had private insurance. The odds ratio was 3.26 for [infants](#) whose families were self-pay patients. These families have no health insurance coverage, not even Medicaid, Dr. Radhakrishnan explained.

Infants from families whose income was in the lower two quartiles had a 20 percent higher risk of death when compared to those who were considered to be affluent. Household income was \$46,999 or below for those in the lower two quartiles and \$47,000 or more for those in the upper two quartiles.

"Sepsis in general has been a focal point of surgical quality improvement efforts for several years. The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), for example, is always trying to help surgery programs prevent sepsis and improve outcomes. Our study findings indicate that we need to focus on specific groups of patients to reduce mortality for newborns. The lack of health insurance and low socioeconomic status should raise red flags and tell us that we have to be vigilant about the increased risk of sepsis. In addition, early prenatal interventions targeting at-risk populations, could contribute to better neonatal outcomes," Dr. Radhakrishnan concluded.

More information: 1 Heron M, Deaths: Leading causes for 2014. National vital statistics reports. National Center for Health Statistics. 2016; 65(5):13.

2 Kermorvant-Duchemin E, et al. Outcome and prognostic factors in

neonates with septic shock. *Pediatr Crit Care Med*. 2008 Mar;9(2): 186-91.

3 Bohanon FJ, et al. Heart rate variability is more sensitive at identifying neonatal sepsis than conventional vital signs. *Am J Surg*. 2015 Oct; 210(4): 661-7.

4 Weston EJ, et al. The burden of invasive early-onset neonatal sepsis in the United States, 2005-2008. *Pediatr Infect Dis J*. 2011 Nov; 30(11): 937-41.

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