

Study finds infants with low-risk deliveries should not need antibiotics at birth

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Infants born via uncomplicated cesarean delivery, without labor or membrane rupture before delivery and no concern for infection, should not need antibiotics at birth, according to a study by researchers at

Children's Hospital of Philadelphia (CHOP). The findings, which were published today in *Pediatrics*, could help clinicians tailor the use of early antibiotics in newborns. Only those deemed at risk for infection should receive antibiotics, thereby reducing unnecessary use.

"Given the risks associated with early-onset sepsis in infants, it isn't surprising that newborns are often administered [antibiotics](#) immediately after [birth](#)," said first author Dustin D. Flannery, DO, MSCE, an attending neonatologist and clinical researcher at Children's Hospital of Philadelphia. "However, our study shows that it is safe to withhold antibiotics in infants, including those born preterm, with [low-risk delivery](#) characteristics. Such infants are unlikely to be infected at birth, and can be spared the potential complications of systemic antibiotic exposure."

Newborn infants are at risk for early-onset sepsis (EOS), a life-threatening [infection](#) that can occur within 72 hours after birth, due to exposure to bacteria during the birthing process. Predicting which infants will develop EOS, however, is challenging. This has led to an order of magnitude higher rate of antibiotic use compared to the rate of infants with confirmed infection. Prolonged antibiotic use among newborns is associated with serious adverse outcomes among preterm infants and potential longstanding complications among full term infants, underscoring the need for a better way to assess infection risk.

Since the primary way a newborn is exposed to bacteria is through the delivery process, the researchers decided to analyze delivery characteristics to see if they could help providers identify infants at lowest risk of EOS. In a retrospective study, they assessed all infants born between 2009 and 2014 at two Philadelphia birth hospitals who had a blood or cerebrospinal fluid culture obtained within 72 hours after birth. They examined medical record data for confirmed infection and for delivery characteristics, defining a "low-risk" delivery as a [cesarean](#)

[section](#), without rupture of amniotic membranes prior to delivery; an absence of labor or attempts to induce labor; and an absence of suspected or confirmed maternal intraamniotic infection or fetal distress.

The researchers also included infants born across the gestational age spectrum. Prior studies have assessed EOS risk in both extremely preterm (less than 28 weeks' gestation) and full term (37 weeks or more) infants, but few have analyzed the risk among late and moderately preterm infants (28-36 weeks' gestation), despite the fact that these infants make up the bulk of neonatal intensive care unit (NICU) admissions.

Overall, 7,549 infants had a culture drawn and were included in the study. Of these, 1,121 (14.8%) were born in a low-risk delivery setting and 6,428 (85.2%) were not. A total of 41 infants had confirmed cases of EOS; none of the infected patients were born in the setting of a low-risk delivery.

Even though no infants born in a low-risk delivery setting developed EOS, 80% of them were empirically treated with antibiotics. There was no difference between the low risk and non-low risk groups in the proportion of infants who received prolonged antibiotics, suggesting that clinicians did not appreciate or account for the lower risk of infection and stop antibiotics in the absence of confirmed infection.

"In the United States, an estimated 400,000 uninfected term infants receive empirical antibiotics at birth every year, and upwards of 90% of extremely [preterm infants](#) receive antibiotics," Dr. Flannery said. "Our study shows that a well-defined subset of these [infants](#) should not need antibiotics, and clinicians can use delivery characteristics as a guide to prevent unnecessary antibiotic use and avoid potential complications of treatment."

More information: Dustin D. Flannery et al, Delivery Characteristics and the Risk of Early-Onset Neonatal Sepsis, *Pediatrics* (2022). [DOI: 10.1542/peds.2021-052900](https://doi.org/10.1542/peds.2021-052900)

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