RESEARCH HIGHLIGHTS

PAEDIATRICS

Gut microbiota dysbiosis precedes NEC

Infants weighing <1,500 g at birth who go on to develop necrotizing enterocolitis (NEC) are more likely to have preceding gut microbiota dysbiosis than infants who do not develop the disease, reports a new prospective casecontrol study published in *The Lancet*. Stool samples from infants who later developed NEC had an increased prevalence of Gammaproteobacteria, and a lower prevalence of Clostridia and Negativicutes, compared with controls.

Gut microbiota have long been suspected to play a part in the development of NEC, which is most commonly seen in infants weighing <1,500 g, who are often also premature. "NEC does not occur in utero, increased antibiotic exposure in the first week of life has been shown to be a risk factor, probiotics have demonstrated some benefit in many trials, and feeding with human milk appears to be beneficial," explains author Phillip Tarr. "However, the microbial risk was not well defined — studies had varying conclusions, and less extensive sample sizes (of both infants and stools), each of which presented challenges."

In the largest prospective casecontrol study to date on dysbiosis and NEC, the investigators enrolled 972 infants weighing <1,500 g at birth at three centres in the USA, and collected and froze all of the stools they produced. Of these infants, 58 (6%) developed NEC. Using 16S ribosomal RNA sequencing, the researchers characterized the bacterial composition of stool samples from cases (infants who later developed NEC, n = 46) and matched controls (infants who did not develop NEC, n = 120). "Modern sequencing technology enabled the Gut microbiota have long been suspected to play a part in the development of NEC... enumeration of microbial populations to an unprecedented depth, and avoided culture-dependent limitations," says Tarr.

In infants born at <27 weeks gestation, those who went on to develop NEC had markedly altered microbial content at 31-45 and 46-60 days of age compared with those infants who did not later develop NEC. "We have identified a microbial risk signature (increased Gammaproteobacteria prevalence) and a microbial protective signature (increased prevalence of anaerobes, in particular Negativicutes and possibly also Clostridia) in stools produced before NEC occurs," states author Barbara Warner. "This bacterial signature offers, at the very least, a biomarker for soon-to-develop NEC."

Hugh Thomas

ORIGINAL ARTICLE Warner, B. B. et al. Gut bacteria dysbiosis and necrotising enterocolitis in very low birthweight infants: a prospective casecontrol study. Lancet http://dx.doi.org/10.1016/ S0140-6736(16)00081-7 (2016) FURTHER READING [ain, N. et al. Diet and host-

microbial crosstalk in postnatal intestinal immune homeostasis. Nat. Rev. Gastroenterol. Hepatol. **12**, 14–25 (2015)