803

THE INTESTINAL MICROBIAL COMMUNITY OF INFANTS WITH AND WITHOUT NECROTISING ENTEROCOLITIS

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Background and aims: Necrotising enterocolitis (NEC), a serious gastrointestinal (GI) disease of prematurity, has a prevalence of 5-10% and mortality rate of 30%. The aetiology is not clearly defined. The GI microflora is involved with immune-regulation. Abnormal GI colonisation in premature infants may adversely affect immune-function predisposing to NEC. Cultivation studies suggest an alteration in GI organisms preceeding NEC. The aim of this study was to test this hypothesis using modern molecular methods.

Methods: We performed a case-control study using faecal samples obtained prospectively (from birth - 8 weeks) from participants of a randomised controlled trial of probiotic use in premature infants (< 1500gms birthweight, < 32 weeks gestation) at a tertiary neonatal centre. The microbial profile of samples was assessed using 16S rRNA PCR and Denaturing Gradient Gel Electrophoresis. Results were compared to identify differences in biodiversity between cases and controls.

Results: Thirteen cases of NEC were identified from the RCT records. 60 samples were analysed from cases; 81 from matched-controls. Samples taken shortly after birth were sterile, however, all infants were colonised with bacterial species by the end of the week 1. Biodiversity gradually increased with time in cases and controls. A greater increase in diversity was observed in cases before and during NEC episodes.

Conclusions: This pilot study of 26 premature infants confirms GI sterility at birth and bacterial colonisation after 1 week. An increase in GI biodiversity is associated with NEC. These findings will guide further investigation of the intestinal microbial community of premature infants.