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## ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY

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**Exploring the gut microbiota of Lebanese preterm infants with or without necrotizing enterocolitis****Carole Ayoub Moubareck, Tarek Itani and Dolla Karam-Sarkis**  
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**Statement of the Problem:** Necrotizing enterocolitis (NEC) is a devastating inflammatory disease which primarily affects preterm infants (PTI). Although its exact etiology remains unknown, gut bacterial colonization is recognized to play a pivotal role in its development. In this study, we hypothesized that differences in bacterial colonization exist between Lebanese PTI with and without NEC.

**Methodology & Theoretical Orientation:** A total of 11 PTI developing NEC was selected from three Lebanese neonatal intensive care units and matched with 11 controls. Three time intervals were defined: (a) before NEC; (b) most proximate to NEC; and (c) after NEC onset. Fecal samples were analyzed by q-PCR and TTGE.

**Findings:** By qPCR, all infants were colonized by *Staphylococci* and *Enterococci* with significant differences in colonization before NEC onset. Higher colonization levels by *Staphylococci* ( $p=0.034$ ) and lower colonization levels by *Enterococci* ( $p=0.039$ ) and *Lactobacilli* ( $p=0.048$ ) in the NEC group were noticed indeed. Almost all infants were colonized by *Enterobacteriaceae* at high levels with a trend to higher frequency of colonization in NEC PTI during and after NEC onset. *Bacteroides* and all *Clostridia* (except cluster I) were strongly underrepresented in both groups. Furthermore, throughout the sampling period, comparison of stool samples by TTGE revealed no particular clusterisation suggesting a high inter-individual variability.

**Conclusion & Significance:** This study did not incriminate a unique causative pathogen but suggested that NEC resulted in part from a perturbation of the intestinal microbiota. It described an abnormal gut microbiota profile in NEC PTI that included high levels of colonization by *Staphylococci* and low levels of colonization by *Enterococci* and *Lactobacilli*. This understanding in NEC etiology might be translated into better prophylactic interventions including the use of pre and/or probiotics in order to reduce the incidence and severity of NEC.

**Biography**

Carole Ayoub Moubareck is a pharmacist who is specialized in microbiology (Ph.D from the Paris Descartes University) then pursued a Post-doctoral work at the Institute Pasteur of France. She was responsible of the National Reference Center of Antibiotic Resistance in France from 2007 to 2009. She has worked at Saint Joseph University in Lebanon and since 2014 she has been in Zayed University in Dubai as Associate Professor. Her research interests are in controlling infectious diseases by monitoring the emergence and spread of resistant bacteria to antibiotics and characterizing the related resistance mechanisms. She is also interested in food safety by assessing the innocuity of food strains and studying gene transfers from animal to human bacteria in the digestive ecosystem and evaluating the influence of environmental factors. An essential part of her research is about the determination of the intestinal microbiota of preterm infants and the relationship with the establishment of necrotizing enterocolitis.

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