

POTENTIALLY PATHOGENIC BACTERIA IN NASOGASTRIC FEEDING TUBES OF NEONATES – AN OBSERVATIONAL STUDY

Sandra Meinich Petersen¹, Gorm Greisen¹, Karen Angeliki Krogfelt²

¹ Neonatal Clinic, Rigshospitalet, University of Copenhagen, Denmark, ² Statens Serum Institut, Copenhagen, Denmark

Objectives

Preterm infants are vulnerable to the spontaneous colonization that occurs shortly after birth. They are at risk of developing feeding intolerance, postnatal growth restriction, sepsis or necrotizing enterocolitis. Nasogastric feeding tubes used at the neonatal department could be a particular source to the early colonization of the gut of the infant. Previous studies have focused on biofilm formation in feeding tubes. As biofilm studies investigate the stable part of the microbiology of the tube, we thought it would be clinically relevant to investigate the load of bacteria an infant is exposed to when a meal is flushed through the tube. Our main question was if the risk of finding pathogenic bacteria increases with the time the nasogastric feeding tube has been in place.

Methods

We conducted a prospective, observational study at the tertiary neonatal department at Rigshospitalet, Copenhagen, where we collected nasogastric feeding tubes in April and May 2014 from all infants, term and preterm, admitted to the department. We flushed every tube with a saline solution to mimic a meal given through the tube and this “meal” was then cultured, bacteria isolated and identified by means of the VITEK 2 system. A contaminated tube was defined as having more than 1000 CFU/mL of potentially pathogenic enteric bacteria. Statistics were performed in SPSS Statistics 20 where a Mann-Whitney U-test was performed.

The study was approved by the Danish Ethical Committee (Protocol number: H-1-2014-009), and written informed consent was sought from one of the parents according to Danish law.

Results

We collected 94 feeding tubes from 34 infants with a range of 1 to 10 tubes per infant. The infants had a birth weight of 305 g to 3555 g, and their gestational age ranged from 24+4 to 39+5 weeks. The tubes had been in place between 0 and 14 days (median = 3). Preliminary data show that 37 tubes (39 %) were contaminated with the potentially pathogenic enteric bacteria: *Klebsiella* spp., *Enterobacter* spp. and/or *Escherichia* spp. The density ranged from 1×10^3 to 2.5×10^9 CFU/mL. The species identified were *Klebsiella oxytoca* (15), *Klebsiella pneumoniae* (5), *Enterobacter cloacae* (17), *Enterobacter aerogenes* (2) and *Escherichia coli* (3). There was no association between growth of these organisms and the time the feeding tube had been in place ($p = 0.20$).

Conclusion

These preliminary data suggest that potentially pathogenic bacteria are commonly delivered from feeding tubes to the stomach of infants admitted to neonatal units. There is no significant evidence that this can be avoided by changing the tubes more frequently.

Acknowledgements:

Thanks to Susanne Schjørring, Steffen Jørgensen and Christina Tingbjerg Brandt for laboratory support.