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microscoop

Enterobacteriaceae biofilm formation on neonatal feeding tubes

Biofilms are multicellular microbial communities that can form on various surfaces. Due to decreased growth rates, differential gene expression, and reduced penetration of the biofilm, cells growing within these communities are often more tolerant to harsh microenvironments than free-living, planktonic cells. Unfortunately, this adaptation has significant diagnostic and therapeutic consequences as biofilm formation can ultimately lead to persistent infection, resistance to phagocyte killing, tissue damage, and protection against antimicrobial therapies.

In healthcare settings, biofilms have been detected on a number of long-term use medical devices including catheters, artificial valves, pacemakers, and nasogastric enteral feeding tubes5. In a recent study by Hurrell et al., nasogastric enteral feeding tubes from neonatal intensive care units were examined to determine if they could act as loci for the attachment and multiplication of bacterial pathogens within the Enterobacteriaceae family6. In this analysis, Hurrell et al. examined 129 enteral feeding tubes from neonates receiving different feeding regimes and discovered that 76% of enteral feeding tubes were colonized by microorganisms within a biofilm. The most common isolates discovered included Enterobacter cancerogenus, Serratia marcescens, Enterobacter hormaechei, Escherichia coli, and Klebsiella pneumoniae. Of these strains, a number were determined to be resistant to one or more antibiotics.

Overall, the results from this study indicate that neonatal enteral feeding tubes, regardless of the feeding regime, can be colonized by pathogenic species within the Enterobacteriaceae family that have the ability to form biofilms. Therefore, the enteral feeding tube should be considered as a potential source of infection in neonates as its prolonged placement may increase the risk of exposure to bacterial pathogens.

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A CDC microbiologist working with *Acinetobacter baumannii*. Photo courtesy of James Gathany and CDC.

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