J Med Microbiol. 2003 Sep;52(Pt 9):829-33.

Bacteriocin-like inhibitory substance (BLIS) production by the normal flora of the nasopharynx: potential to protect against otitis media?

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Abstract

The normal bacterial flora of the upper airways provides an important barrier to invading pathogens. This study investigated the **production** of **bacteriocin-like inhibitory** substances (**BLIS**) by streptococci isolated from the nasopharyngeal flora of children who either do or do not experience recurrent acute otitis media (AOM). Twenty children with recurrent AOM and 15 controls were tested. Swabs from the nasopharynx were evaluated for streptococci having **BLIS** activity against two representative strains of each of the AOM pathogens Streptococcus pneumoniae, Streptococcus pyogenes, Haemophilus influenzae and Moraxella catarrhalis. Streptococci displaying strong **BLIS** activity were characterized further and tested for known streptococcal **bacteriocin** structural genes. Sixty-five per cent of children had nasopharyngeal streptococcal isolates that were **inhibitory** to strains of one or more of the AOM pathogens. Six children (17 %) had streptococci that demonstrated strong **BLIS** activity against strains of at least three of the pathogenic species. Three of these **inhibitory** isolates were Streptococcus salivarius, two were S. pneumoniae and one was S. pyogenes. The **inhibitory** S. salivarius and S. pyogenes were shown to have structural genes for known streptococcal **bacteriocins**. No statistically significant difference was found between the two groups of children with respect to the presence of **inhibitory** streptococci in their nasopharyngeal floras. The finding of S. salivarius with strong **inhibitory** activity against several AOM pathogens in the nasopharyngeal flora of children is unique. Although there is no clear evidence from the present study that these organisms protect against AOM, their low pathogenicity and strong in-vitro **BLIS production** capability indicate that they should be incorporated in future trials of bacteriotherapy for recurrent AOM.

PMID: 12909662 [PubMed - indexed for MEDLINE] **Free full text**