Adenoids, Friends or Foes?

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Introduction

Adenoids are a mass of lymphatic tissue located within the nasopharynx. It has been shown that adenoids play a key role in respiratory and ear infection during childhood and adenoidectomy could improves these symptoms¹. The main goal of the present study was to evaluate the role played by adenoid colonization with bacterial biofilms and the incidence of recurrent infections within a pediatric population.

Material and Methods

Nasal and pharyngeal tonsils swabs as well as biopsy of pharyngeal tonsils tissue were collected from 62 participants in a prospective observational study with ages from 1 to 12 years old, subject to adenoidectomy by either infectious or non-infectious indications. Bacteria identification was performed as previously described².

Results and Discussion

Microbiota

The microbiota isolated from patients with both infectious (Fig 1A, C and E) and non infectious surgery indications (Fig 1B, D and F) was diverse including bacteria from 33 different genera. Haemophilus, Neisseria, Streptococcus and Staphylococcus were the most frequent.

Biofilms in vivo

SEM analysis revealed the presence of biofilms in 27% of the adenoid biopsies.

Biofilm assembly in vitro

H.influenzae (24), S. aureus (12), S. pneumoniae (10), S. pyogenes (8) and M. catarrhalis (2) isolated simultaneously on adenoid surface and core were ranked for biofilm assembly according to Stepanovic and colleagues³.

No direct relation between the ability to assemble biofilms in vitro and the presence of biofilms on the adenoid (biomfilm in vivo) was found.

Antibiotic susceptibility

Table 1. Antibiotic susceptibility

The majority of bacteria were antibiotic susceptible independently of its origin (sample with or without biofilms). This result might be explained at least partially, by the nature of the sample since the adenoidectomy can only be performed in individuals without infection.

H. influenzae: virulence factors

H. influenzae, the most isolated bacterium, is an opportunistic pathogen, highly adapted to colonize the upper respiratory tract and easily progresses to infection, especially in children. For this reason, virulence factors such as the capsular type were investigated by PCR. However, all strains were characterized as non-capsulated, which might explain adenoid colonization and biofilm formation, as have also been described in the literature.

Final Remarks

The obtained results support the existence of bacterial biofilms on the adenoidal surface. This fact together with the existence of an identity between bacteria on adenoidal surface and core only in the group of patients with infectious indication for adenoidectomy supports the hypothesis that adenoids can function as reservoirs of potentially pathogenic bacteria. Nevertheless, more work must be developed to unequivocally support this thesis.

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