Correlation between microbiological profiles of adenoid tissue and nasal discharge in children with co-existent chronic adenoiditis and chronic rhinosinusitis.

Dr Rohit Singh, Associate Professor ENT-HNS,Kasturba Medical College,Manipal,Manipal Academy of Higher education

Introduction:
Chronic adenoiditis leading to adenoid hypertrophy is common in children. Many of those affected children would also have co-existing chronic rhinosinusitis(CRS). Infact, long lasting bacterial infection of the adenoids has been hypothesized to be the one of the causes for CRS in these children. There are reports of improved signs and symptoms of CRS after the removal of the hypertrophied adenoids in the same children. Though, bacteria isolated from the adenoids have been implicated in the pathogenesis of CRS, not many authors have studied the bacteriological profiles of both the adenoids and the adenoiditis together.

Objectives:
• To study the association between the microbiological profiles of the adenoiditis and the CRS in children diagnosed to have these co-existing conditions.
• The purpose is to identify the etio-pathological similarities between these conditions, if any.

Materials and Methods:
A cross sectional study was conducted at KMC,Manipal India, between September 2016 and February 2017 . The criteria for inclusion into the study was co-existing chronic rhinosinusitis in children who were undergoing adenoidectomy for chronic adenoiditis. After parents consents, the nasal swabs were taken from the study participants under general anesthesia, during the adenoidectomy procedure. The nasal swabs were collected from middle meatus under endoscopic guidance just before the adenoid resection by cold instruments. The nasal swabs and then the curetted adenoid tissue were collected into a sterile container and sent for bacterial as well as fungal culture and sensitivity studies. For anaerobic culture, adenoid tissues were inoculated directly into Robertson's cooked meat broth bottles were incubated for 48 hours and then were cultured on Blood agar, Neomycin blood agar & Phenyl ethyl alcohol, and then the plates were incubated anaerobically in anaerobic work station . Both the nasal swab and the tissue were inoculated onto Sabouraud's dextrose agar for fungal culture. The period of incubation in culture conditions varied ranging from 48 hours to 3 weeks. However, for the growth to be considered as negative for any organism, the minimum incubation period considered was 48 hours in case of aerobic culture, 5 days for anaerobic culture and 5 days for fungal culture. The organism cultured from these specimens were tabulated, and the correlation between the nasal specimens and the adenoid tissue specimens was analyzed.

Results:
After incubation the plates were observed up to 7 days for presence of growth. Gram staining was done from each colony prototypes and identification was done by bio-chemical reaction. For Anaerobic culture of the adenoid tissue specimen, the inoculated specimen in Robertson's cooked meat broth bottles were incubated for 48 hours and then were cultured on Blood agar, Neomycin blood agar & Phenyl ethyl alcohol, and then the plates were incubated anaerobically in anaerobic work station. Both the nasal swab and the tissue were inoculated onto Sabouraud's dextrose agar for fungal culture. The period of incubation in culture conditions varied ranging from 48 hours to 3 weeks. However, for the growth to be considered as negative for any organism, the minimum incubation period considered was 48 hours in case of aerobic culture, 5 days for anaerobic culture and 5 days for fungal culture. The organism cultured from these specimens were tabulated, and the correlation between the nasal specimens and the adenoid tissue specimens was analyzed.

Discussion: Our results do not support the bacteriological association between the adenoiditis and CRS. Kim et al(2018) study on 12,000 children followed up for up to 9 years, downplayed the beneficial effect of adenoidectomy on sinusitis. An den Aardweg et al (2010) Cochrane review itself has concluded that the evidence regarding the beneficial effect of adenoidectomy on CRS symptoms to be insufficient and inconclusive. Even if there is any symptomatic benefit in CRS children after adenoidectomy, it is unlikely to be due to the removal of reservoir of pathogenic bacteria. This symptomatic relief could be attributed to the relief of mechanical obstruction otherwise caused by hypertrophied adenoids and to the improved mucociliary characteristics. Adenoidectomy has been shown to improve the nasal mucociliary clearance time and the mucociliary clearance velocity along with subjective relief of nasal obstruction.

Our results were similar to Elwany et al (2011) study in terms of anaerobic bacterial isolation from adenoid core tissue.

Conclusions:
The is no significant bacteriological association between adenoiditis and chronic rhinosinusitis in pediatric age groups. Adenoidectomy relieves mechanical obstruction and not necessarily the reservoir of pathogenic bacteria. Though we were not able to establish any bacteriological association with the CRS in our cohorts, the significant growth of the anaerobes from the core of the inflamed adenoids has prompted us to suggest the inclusion of the antibiotics against the anaerobes in the medical management of these children, whenever feasible.

Table 1: The culture reports of the study cohort. Sl no- serial number of patient, M – male, F – female, CNS - Coagulase negative Staphylococcus sp, MSSA – Methicillin Sensitive Staphylococcus aureus, MRSA - Methicillin Resistant Staphylococcus aureus, BHS - Beta haemolytic streptococcus sp, FS - Fusobacterium sp, VP - Veillonella parvula, PS - Prevotella sp. The age is in years and the numbers in paracentesis denote days of incubation. Whenever feasible.