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# The difference in the nasal bacterial microbiome diversity of chronic rhinosinusitis patients with polyps and a control population

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**Statement of the Problem:** Little is known regarding the role of the microbiome of the paranasal sinuses and its contribution to sinus mucosal health and disease. Consequently, we examined the microbiome of chronic rhinosinusitis patients with polyps (CRSwNP) and a control population to provide new insights into the microbiota associated with the pathogenesis of CRSwNP.

**Methodology & Theoretical Orientation:** Fifty-two CRSwNP patients and 17 controls were enrolled in the study. The bacterial communities of the middle meatus were detected using 16S ribosomal RNA (rRNA)-targeted Illumina MiSeq sequencing after microbial DNA was extracted from swabs.

**Findings:** Although there was no difference in diversity between the two groups, richness was lower in the CRSwNP group compared with the controls ( $p=0.02$ ). At the phylum level, *Firmicutes*, *Proteobacteria*, *Actinobacteria*, and *Bacteroidetes* were predominant in both groups; however, the relative abundance was different, with the proportions of *Proteobacteria* (mostly *Moraxella*), *Actinobacteria* (predominantly *Corynebacterium*, *Propionibacterium*), *Acidobacteria* and *Dolosigranulum* significantly higher in the control group than in the CRSwNP group.

**Conclusion & Significance:** These results supported the theory of microbial dysbiosis as the pathogenesis of CRSwNP. The reduction in the proportions of potentially protective bacteria may decrease the overall stability of the sinonasal bacterial community.

Student's t-test for estimator

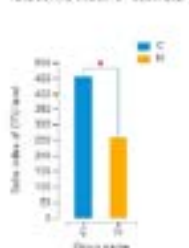


Figure 1: Difference in the Sobs index at the OTU level between the two groups



Figure 2: The dominant bacterial genera in both groups, shown on a bar chart (B)

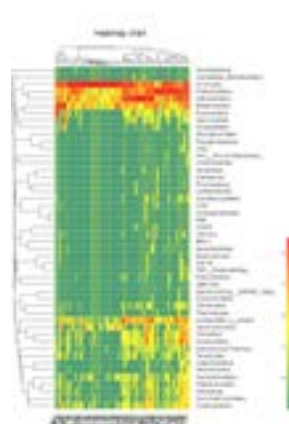


Figure 3: Heat map illustrating the beta diversity values for richness and distances of subjects at the phylum level



Figure 4: Correlation heat map reflecting the relationship between microbial taxa and environmental variables at the genus level

**Recent Publications**

1. Gan W, Xiang Y(2018) Extranasal glial heterotopia in a female infant: A case report. *Medicine*. Accepted(Jul 24)
2. Gan W, Meng J(2018) The diversity of nasal bacterial microbiome between chronic rhinosinusitis patients with polyps and control population. *International Forum of Allergy and Rhinology.(IFAR) Major Revision (Jul 09)*
3. Gan W. Microvascular density and clinical significance of CD34 and CD105 in laryngopharyngeal squamous cell carcinoma, *Chinese journal of otorhinolaryngological skull base surgery*, 2015,2 (21) 116-118+123
4. Gan W, Xiang Y. Expression and clinical significance of integrin 1 in hypopharyngeal squamous cell carcinoma, *Chinese journal of otolaryngology and laryngopharyngeal base surgery*, 2014,20 (3) : 199-203
5. Gan W, Hung Y. Expression and significance of VEGF and MVD in hypopharyngeal squamous cell carcinoma, *Journal of north sichuan medical university*, 2013, 28(3): 222-228

**Biography**

Weigang Gan has his expertise in basic research of allergic rhinitis and rhinosinusitis in improving the health and wellbeing. He also devoted to clinical research of therapeutic method of allergic rhinitis and rhinosinusitis, especially patients with nasal polyps. He is not only good at endoscopy surgery, but also at medicine therapy. He took part in Chinese Union of Otorhinolaryngology, and kept membership for several years.

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