

# Nasal Polyposis: A Review

Sushna Maharjan<sup>1\*</sup>, Puja Neopane<sup>2</sup>, Mamata Tiwari<sup>1</sup> and Ramesh Parajuli<sup>3</sup>

<sup>1</sup>Department of Pathology, Chitwan Medical College Teaching Hospital, Nepal

<sup>2</sup>Department of Oral Medicine and Pathology, Health Sciences University of Hokkaido, Japan

<sup>3</sup>Department of Department of Otorhinolaryngology, Chitwan Medical College Teaching Hospital, Nepal

**Submission:** May 07, 2017; **Published:** May 30, 2017

\***Corresponding author:** Sushna Maharjan, Department of Pathology, Chitwan Medical College Teaching Hospital (CMC-TH), P.O. Box 42, Bharatpur, Chitwan, Nepal, Email: [sushnamaharjan74@gmail.com](mailto:sushnamaharjan74@gmail.com)

## Abstract

Nasal polyp is a benign lesion that arises from the mucosa of the nasal sinuses or from the mucosa of the nasal cavity as a macroscopic edematous mass. The exact etiology is still unknown and controversial, but it is assumed that main causes are inflammatory conditions and allergy. It is more common in allergic patients with asthma. Interleukin-5 has found to be significantly raised in nasal polyps. The patients usually present with nasal obstruction, rhinorrhea and postnasal drip. Magnetic resonance imaging is suggested, particularly to rule out serious conditions such as neoplasia. Histopathological examination is also suggested to rule out malignancy and for definite diagnosis.

**Keywords:** Allergy; Interleukin-5; Nasal polyp; Neoplasia

**Abbreviations:** M:F- Male: Female; IgE: Immunoglobulin E; IL: Interleukin; CRS: Chronic Rhinosinusitis; HLA: Human Leucocyte Antigen; CT: Computerized Tomography; MRI: Magnetic Resonance Imaging

## Introduction

Nasal polyps are characterized by benign lesions that arise from the mucosa of the nasal sinuses, most often from the anterior ethmoid complex [1] or from the mucosa of the nasal cavity. They are common chronic inflammatory diseases of the nasal mucosa. These polyps can descend between the middle turbinate and the lateral nasal wall into the nasal cavity causing symptoms such as nasal congestion, rhinorrhea, hyposmia and facial pressure [2]. It is challenging for the otorhinolaryngologist to treat as they have an uncertain etiology and a tendency to recur. It is even more important for the respiratory physician to be aware of effects of the treatment of nasal polyps which can cause bad impact on chronic obstructive pulmonary disease, particularly in asthma. The incidence of nasal polyps is around 4% in the general population [3]. Laren et al. [4] has shown higher incidence about 40% in cadaveric studies. Adults are predominantly affected, usually patients older than 20, and are uncommon in children under 10. Male are commonly affected with M: F ratio of 2:1. Up to a third of patients with nasal polyps have asthma, but polyps are detected only in 7% of asthmatics [5].

## Discussion

### Etiology of nasal polyp

Many proposed theories consider that nasal polyps are a consequence of conditions which cause chronic inflammation in

the nose and nasal sinuses characterized by stromal edema and variable cellular infiltrate [6]. While in many cases the initiating cause may be different. However, the etiology of nasal polyps is clearly not known [7].

It was previously assumed that allergy as the predisposing factor for nasal polyps because the symptoms of watery rhinorrhea and mucosal swelling were present in both conditions, associated with an abundance of eosinophils in the nasal secretions. However, a little evidence was found to support their relationship with each other constituting only 1%-2% of patients having positive skin prick tests in epidemiological studies [8]. In the study conducted by Jamal et al. [9], it has shown that nasal polyps are no more common in atopic individuals. However, Bachert et al. [10] had shown that total and specific IgE as well as other allergic-type histologic features of polyps are unrelated to positive skin prick tests but correlated with the levels of eosinophils. Therefore, the possibility of the local allergic mechanisms in the absence of systemic features could play a role in the pathogenesis of polyps.

Some studies have focused on eosinophilic mediators in nasal polyp tissue and demonstrated that different cell types generate these mediators. Interleukin-5 (IL-5) has found to be significantly raised in nasal polyps compared with healthy controls and the concentration of IL-5 was independent of

the atopic status of the patient [10]. The association between nasal polyps with fungus has been established for many years with fungal culture positivity [11]. Some authors have linked this finding with allergic bronchopulmonary aspergillosis [12]. Although some hypotheses have shown the possible involvement of micro-organisms in the etiology of nasal polyps, a successful treatment alternative has not yet developed. Chronic rhinosinusitis (CRS) almost always coexists with nasal polyps, whereas the converse is not true, only about 20% of the patients with CRS develop nasal polyps [5]. Evidence suggests that CRS with nasal polyps and CRS without nasal polyps actually are two different disease entities [13,14]. A genetic link has also been demonstrated, involving HLA-A74 and nasal polyps [15] but there is still a limited knowledge in this matter. There are some medical conditions commonly associated with polyps which include asthma, bronchiectasis, and cystic fibrosis [5]. Patients with Samter's Triad have polyposis, asthma, and aspirin hypersensitivity.

## Clinical presentation

The frequent presenting symptom of nasal polyps is nasal obstruction but can vary depending on the site and size of the polyps. Others symptoms are watery rhinorrhea and postnasal drip. They are insensitive to palpation and rarely can bleed. The characteristic symptoms are anosmia or hyposmia with an alteration in taste [16]. They are mostly bilateral and when found unilateral require histological examination to exclude malignancy or other pathology like inverted papilloma [17]. Single or multiple pale, grey polypoid macroscopic masses arising most frequently from the middle meatus and prolapsing into the nasal cavity are found on rhinoscopy. Histological examination reveals polypoidal tissue composed of loose connective tissue, edema, inflammatory cells, and some capillaries and glands [18]. The surface of nasal polyps is covered with different types of epithelium, most commonly pseudostratified respiratory epithelium with goblet cells and ciliated cells. The most common inflammatory cell infiltrates in nasal polyps are eosinophils. Nasal polyps are histochemically differentiated from rhinosinusitis by detecting IL-5 due to the presence of eosinophils [19]. About 85% of nasal polyps contain eosinophils and the remaining consists of mostly neutrophils [20].

## Investigations

History of the patients associated with the endoscopic findings can make the diagnosis of nasal polyps. Plain X-rays are insensitive but may show opacification of the affected sinuses [21]. A CT scan is essential if surgical treatment is required. However, it should not be considered as the primary investigation in the diagnosis of the condition, except where there are unilateral signs and symptoms or other sinister features, but rather corroborates history and endoscopic findings after failure of medical therapy. CT scan will show the extent of nasal polyps and anatomical variations. In unilateral cases of nasal polyps, a magnetic resonance imaging (MRI) may aid diagnosis, particularly to rule out serious conditions such as

neoplasia. Histopathological examination is also suggested to rule out malignant conditions and for definite diagnosis.

## Conclusion

The conditions leading to inflammation and allergy usually cause the nasal polyps but the exact etiology is still unknown.

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DOI: [10.19080/GJO.2017.08.555731](https://doi.org/10.19080/GJO.2017.08.555731)

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