World Journal of Environmental Biosciences

Available Online at: **www.environmentaljournals.org**

Volume 11, Issue 1: 13-16

https://doi.org/10.51847/gde2ofOvaO

ISSN 2277- 8047

An Overview on Nasal Polyps' Diagnosis and Management Approach

Ahmed Mahmoud A Alqurashi[1], Saif Abdulaziz H Jawmin[1], Turki Abdulmuin A Althobaiti[1], Mohammad N M F A Aladwani[2], Abdullah Mohammed E Almuebid[3], Joud Fahad Abdullah Alharbi[4], Mohammed Ali Zarei[5]*, Lamia Saeed Abdulrahman Al Ghaseb[5], Waleed Khalid Nawwab[6], Nedaa Ahmed Zamzamy[6], Saeed Ali Al Khozym[7], Abdulaziz Mohammed Y Hamdi[8], Muaath Ahmed AlGhamdi[9]

[1]Faculty of Medicine, Taif University, Taif, KSA.
[2]Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan.
[3]Faculty of Medicine, Imam Abdulrahman bin Faisal University, Dammam, KSA.
[4]Faculty of Medicine, Ibn Sina National College of Medicine, Jeddah, KSA.
[5]Faculty of Medicine, King Khalid University, Abha, KSA.
[6]Faculty of Medicie, Umm Al Qura University, Makkah, KSA.
[7]Department of ENT, King Fahad Specialist Hospital, Tabukj, KSA.
[8]Faculty of Medicine, Jazan University, Jazan, KSA.
[9]Department of Family Medicine, Sulaimaniya PHC, Riyadh, KSA.

ABSTRACT

The current management is still controversial and depends upon understanding the complex pathophysiological and etiological factors. There have been several theories that proposed the initial process regarding polyps' formation. Confirming the diagnosis of nasal polyps requires endoscopic investigations or complex radiological investigations. However, currently available medications are mostly based upon clinical experience that describes these pathophysiological and etiological hypotheses. This review provides a wide view on the current evidence-based diagnosis and management abilities in Nasal polyp's conditions, to fully be able to help and aid ENT clinicians to provide good medical compliance throughout the medication process. This review was classified and collected from eligible publicized only English written extracts, articles, and advanced clinical trials. These electronic research engines were included: PubMed and Google Scholar database. Keywords were used together in combination. Treating nasal polyps is directed to relieve symptoms and upgrade therapeutic management to provide the best results of care. The role of endoscopic surgical therapy is highly effective in treating chronic rhinosinusitis if the palliative medical management is found ineffective.

Keywords: *Rhinosinusitis, Nasal polyps, Diagnosis, Management, Guidelines*

Corresponding author: Mohammed Ali Zarei
e-mail ✉ DR-mozarei@outlook.sa
Received: 19 September 2021
Accepted: 22 December 2021

INTRODUCTION

Nasal polyps present have been a characteristic form of chronic persistent inflammation that is associated with severe and chronic allergic rhinitis hypercreativity reactions, chronic sinusitis, and other chronic inflammatory indeterminate etiologies (Schleimer, 2017; Shamji *et al*., 2019). Genetical and environmental eosinophilic polyps that are also considered to be responsive and are primarily enhanced sinonasal severity (Stevens *et al*., 2015; Bochner & Stevens, 2021). Confirming the diagnosis of nasal polyps requires endoscopic investigations or complex radiological investigations (Akdis *et al*., 2015).

The current management is still controversial and depends upon understanding the complex pathophysiological and etiological factors. There have been several theories that proposed the initial process regarding polyps' formation (Cayé-Thomasen *et al*., 2004; Schleimer, 2017). However, currently available medications are mostly based upon clinical experience that describes these pathophysiological and etiological hypotheses (Ta, 2019).

This review provides a wide view on the current evidence-based diagnosis and management abilities in Nasal polyp's conditions, to fully be able to help and aid ENT clinicians to provide good medical compliance throughout the medication process.

MATERIALS AND METHODS

This review was classified and collected from eligible publicized only English written extracts, articles, and advanced clinical trials. These electronic research engines were included: PubMed and Google Scholar database. The keywords "Nasal"

and 'Polyps 'including words used in MeSH(((('Diagnosis' [Mesh])) ,(('Management' [Mesh])) , ((' Guidelines' [Mesh])) , (('Treatment' [Mesh])) ,(("Biologics" [Mesh])) were used together in integral combinations. This review discussed the first step for diagnosing and treating nasal polyps. All details involving this topic including medical definitions, pathological and physiological classifications, and guidance for treatment were included in this review.

Review

Nasal polyps formation

The different patterns of inflammations in the nasal mucosa have a great impact on the development of nasal polyps in patients with chronic rhinosinusitis issues. Chronic rhinosinusitis is characterized by recurrent nasal congestions, posterior or anterior rhinorrhea, hyposomia, facial pain for 12 weeks or more (Orlandi *et al*., 2016; Fokkens *et al*., 2019; Takabayashi & Schleimer, 2020). Nasal polyps are jelly-cyst-like lesions that originate from the surrounding paranasal sinus cavity and the middle nasal meatus. More intense histological features are found to be edematous pseudo cystic stroma that contains plasma proteins such as albumin and low amounts of collagen production and clear features of fibrosis (Takabayashi *et al*., 2013; Takabayashi & Schleimer, 2020).

Etiology of nasal polyps

In treating nasal polyps, understanding the causes of these polyps is crucial for achieving effective and appropriate management. Nasal polyps alone are never considered an ultimate diagnosis. The causes of nasal polyps are not fully known or explained and are usually described in endoscopic pathological associations. However, Nasals polyps etiological hypotheses are clarified into several classifications **(Table 1)** (Ta, 2019).

Table 1. Categorical classifications for nasal polyps for explaining nasal polyps' pathological associations: (Ta, 2019)

Anatomical sites of the lesions	Type of polyps	Pathological and physiological etiologies
Localized	Reactive hyperplastic polyps	Inflammatory Neoplastic
Diffused	Host	Anatomical abnormalities Atopic
	Interactive external factors	Staphylococcus superantigen
	Combination of host and external factors interactions	Allergic fungal hypersensitivity rhinosinusitis, eosinophilic fungal rhinosinusitis, and eosinophilic mucin rhinosinusitis.
Systemic	Cystic fibrosis, Churg- Strauss syndrome	

Examination findings and clinical investigations

Since nasal polyps are associated with chronic rhinosinusitis, patients are suspected to present with chronic nasal congestion, decreased or gradual loss of smell, and rhinorrhea (cardinal symptoms of chronic rhinosinusitis). Positive findings are detected using anterior rhinoscopy or other radiological CT scans [American Academy of Otolaryngology-Head and Neck diagnostic criteria for chronic rhinosinusitis] **(Table 2)** (Rosenfeld *et al*., 2015). The presence of other comorbid conditions such as asthma and allergic rhinitis may promote the existence of nasal polyps (Feng *et al*., 2012).

Table 2. Chronic Rhinosinusitis Diagnostic Criteria of the American Academy of Otolaryngology (Rosenfeld *et al*., 2015).

Symptoms and Signs	Clinical Findings
Nasal Hindrance Nasal effluence Facial discomfort Sleeping disturbances	Physical examination [mucopurulent drainage, polyps, and edema], radiological findings are also preferable.

The investigation for localized nasal polyps must also include microbiological samples, biopsies for further histopathological assessment, particularly for elderly individuals and patients with a high risk of sinonasal malignancies (Feng *et al*., 2012). Intracranial complications in chronic rhinosinusitis are also suspected and require urgent workup for diagnostic and therapeutic assessment. It is important to refer patients to an otolaryngologist soon after revealing neoplasms, to prevent further complications (Rosenfeld *et al*., 2015; Sedaghat, 2017).

Treatment and management

The treatment of nasal polyps depends on the different phenotypes and endotypes analyzed to determine the preferable management [Chronic rhinosinusitis pathophysiology is believed to be associated with T-helper 2 eosinophils, Immunoglobulin E, and high presence of interleukin IL-5, with the dominant presence of cationic eosinophilic protein concentration at the nasal polyp.] **(Table 3)** (Van Zele *et al*., 2006; Akdis *et al*., 2015; Ta, 2019). Treating nasal polyps is directed to relieve symptoms and upgrade therapeutic management to provide the best results of care. Since nasal polyps are associated with chronic rhinosinusitis, non-surgical treatment is dedicated to receiving intranasal corticosteroids, performing nasal saline irrigations, receive short- and long-term oral antibiotics to prevent further infections (Rosenfeld *et al*., 2015).

The main goal of non-surgical treatment is to enhance sinus drainage and improve mucociliary clearance, eliminate local

infections and provide a suitable pathway for topical medications. Otolaryngologists should be informed if patients were not responding to medical treatment and other patients with common comorbidities such as patients who are suffering from asthma or other systemic comorbidities (e.g., Granulomatous diseases, cystic fibrosis, vasculitis, and immunodeficiency) that is involved in the formation of chronic rhinosinusitis (Rosenfeld *et al*., 2015; Ta, 2019).

Table 3. Phenotypes and endotypes of Nasal polyps in chronic rhinosinusitis: (Ta, 2019)

Phenotypes	Nasal polyps' Mucosal eosinophilia	Nasal polyps and Mucosal neutrophilia	Allergic fungal hypersensitivity rhinosinusitis (AFRS)
Endotypes	Increased eosinophil counts Highly intensive edematous nasal polyps Increased IL-4,13,5 are present Increased macrophages count T-helper 2 (Th2) cells are dominant	High neutrophils count and no eosinophils. Presence of high INF-γ and Negative presence f IL-5 High IL-17 Th1 and Th17 are found dominant	Eosinophil's count is high. the fungal culture is positive Ig-E total is high
Recommended proposed treatment and dosing	Intranasal corticosteroids or oral corticosteroids high doses. leukotriene modifiers Desensitization therapy with Aspirin or salicylate Preferable sinus surgery Biologics: Mepoluziman, Reslizumab, Omalizumab	Intranasal corticosteroid high dose. Sinus surgery Antibiotics; Macrolides	Intranasal or oral corticosteroids Preferable use of antifungals, omalizumab.

The role of endoscopic surgical therapy is highly effective in treating chronic rhinosinusitis if palliative medical management is found ineffective. Endoscopic surgery is done to enhance ventilation and paranasal sinuses drainage, yet enlarge the paranasal pathways for outstanding access for topical medications. However, endoscopic sinuses surgeries are known to improve recurrent symptoms but it doesn't provide a definite cure for the condition, and patients are bound to undergo postoperative medical therapy to maintain recent surgical modifications (Sedaghat, 2017).

CONCLUSION

Nasal polyps present have been a characteristic form of chronic persistent inflammation that is associated with severe and chronic allergic rhinitis hypercreativity reactions, chronic sinusitis, and other chronic inflammatory indeterminate etiologies. Treating nasal polyps is directed to relieve symptoms and upgrade therapeutic management to provide the best results of care. The role of endoscopic surgical therapy is highly effective in treating chronic rhinosinusitis if palliative medical management is found ineffective. The surgical treatment of chronic rhinosinusitis involves endoscopic engagement. However, endoscopic sinuses surgeries are known to improve recurrent symptoms but it doesn't provide a definite cure for the condition, and patients are bound to undergo postoperative medical therapy to maintain recent surgical modifications.

ACKNOWLEDGMENTS: None

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: None

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