

OLFACTORY EVALUATION IN POSTOPERATIVE PATIENTS OF CHRONIC RHINOSINUSITIS WITH NASAL POLYPOSIS: LITERATURE REVIEW

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Abstract: Chronic Rhinosinusitis with Nasal Polyposis (CRSwNP) is a chronic inflammatory disease of the nasal mucosa and paranasal sinuses with the formation of multiple, bilateral, benign polyps. Thus, CRSwNP can contribute to hyposmia or even anosmia. It must be noted that the objective of the study is to perform a literature review to evaluate the olfactory pattern after endoscopic nasal surgery in patients with Chronic Rhinosinusitis with Nasal Polyposis. Since this disease directly entails high costs to public health. In addition, there are indirect costs involved, such as decreased productivity and absenteeism. The results showed that surgical predominance in the olfactory evaluation of the clinical condition of CRSwNP is controversial and the management of this pathology is essential to adopt a multifaceted approach. However, studies have revealed that patients undergoing surgical treatment presented better indices in quality of life questionnaires in relation to hyposmia when compared to clinical treatment. The discussion corroborates that defining the surgical plan for CRSwNP together with the patient is of great value, since it is necessary to clarify the surgical options according to the extent of the surgery and the pathology and cause of hyposmia. Thus, evaluating surgical practices with the aim of establishing an improvement in the olfactory pattern resulting from CRSwNP through the restructuring of nasal properties is a necessity in the medical practices of Otorhinolaryngology and, for this reason, new studies must be implemented to establish better confirmatory biases for intervention in quality of life, as well as olfactory.

Keywords: chronic rhinosinusitis with nasal polyposis; olfactory pattern; Connecticut Chemosensory Clinical Research Center test.

INTRODUCTION

The sense of smell has a chemosensory function performed by the olfactory system^(5,12), this sense enables humans to connect and interact with the universe, as well as its role in the process of safety, nutrition and establishing a good quality of life and survival of living beings. The formation of this sense occurs during the embryonic period, and it is considered a visceral sense due to its close relationship with taste and the digestive system, as it is well established that the sense of smell contributes strongly to taste perception.⁽²⁸⁾

This sensory sense, despite all its usefulness in social interactions, is greatly underestimated in its importance in human beings.⁽¹⁵⁾ The observation of hyposmia, which is a sensory limitation, has a severe impact on quality of life. And the impact on quality of life indirectly translates into depression, weight loss and compromised psychosocial well-being. However, smell disorders have gained great importance in recent years. In this context, there are some pathologies that contribute to this sensory alteration, one of which is Chronic Rhinosinusitis with Nasal Polyposis (CRSwNP).

CRSwNP is a chronic inflammatory disease of the nasal mucosa and paranasal sinuses that manifests itself through the appearance of benign, multiple and generally bilateral polypoid formations.^(6,10), originating as pedunculated, edematous protuberances attached to a base in the middle turbinate, ethmoidal bulla, or ostia of the maxillary or ethmoid sinuses.

Polypoid formations are generally soft, shiny, mobile, with a slightly grayish or pinkish coloration, with a smooth surface, painless to palpation and a translucent appearance.⁽²⁶⁾ Histologically, NP shows frequent epithelial damage, thickened basement membrane, edematous and sometimes fibrotic stroma, with reduced number of vessels and glands.

There is an inflammatory infiltrate with a predominance of eosinophils.

Clinically, CRSwNP manifests with nasal obstruction, anterior and/or posterior rhinorrhea, anosmia and/or hyposmia resulting, due to these sensory alterations, in a negative impact on quality of life.⁽³⁰⁾ Among all the symptoms that chronic rhinosinusitis with nasal polyps can present, olfactory disturbance occurs in approximately 80% of cases and is considered one of the most important symptoms by patients in routine consultations, this occurs because the polyps obstruct the passage of odorous substances dissolved in the air to the regions of the olfactory epithelium.

Therefore, the detection of sensory manifestations will be done through, among the different existing olfactory tests, the Connecticut Chemosensory Clinical Research Center (CCCRC) test adapted for the Brazilian population, which evaluates olfactory performance and values of normosmia and hyposmia. However, these tests are not used to diagnose CRSwNP, but rather to determine the olfactory function itself and monitor its response to the treatments instituted.

There is currently a tendency in the literature to consider CRSwNP as an inflammatory disease with a multifactorial cause⁽⁹⁾, and manifested in different diseases, and therefore there are variations in the formation, composition and evolution of chronic and recurrent inflammation and infection. Marked as a pathology present in the practice of otorhinolaryngology with an estimated incidence of 1% to 4% of the general population^(6,26) and is not related to sex, but increases in certain groups of patients.

Studies indicate that CRSwNP is found in 36% of patients with salicylate intolerance, 7% of adult asthmatics, 0.1% of children, and 20-60% of patients with cystic fibrosis. Other clinical conditions are associated with

NP, such as Churg-Strauss syndrome, allergic fungal sinusitis, Kartagener syndrome, and Young syndrome.^(25,31)

| Frequency of association of systemic diseases with polyposis: | |
|---|---------|
| Aspirin intolerance | 36% |
| Intrinsic asthma | 13% |
| Extrinsic asthma | 5% |
| Cystic fibrosis | 60% |
| Chronic sinusitis | 5% |
| Allergic rhinosinusitis | 1% |
| Others: allergic fungal sinusitis, Young, Churg-Strauss, Kartagener | 66-100% |

Source: Textbook of Otorhinolaryngology, third edition. Rio de Janeiro: Elsevier, 2018.

In the context of the clinical evaluation of the patient with Chronic Rhinosinusitis with Nasal Polyposis who seeks otorhinolaryngological medical treatment, a thorough anamnesis must be performed taking into consideration, the importance of the etiological diagnosis in the patient's prognosis. Since, already in the ENT physical examination, enlargement of the nasal pyramid can be observed, indicative of extensive polyposis.

The evaluation of nasal polyps is performed through an endoscopic study and complemented by Computed Tomography (CT) of the paranasal sinuses, which helps in the confirmation and extension of the disease. Anterior rhinoscopy and nasal endoscopy are examinations performed with a rigid or flexible endoscope that show the polyps, the state of the mucosa in the nasal cavities, the presence of secretion and the extension of the process, ensuring the diagnosis of minor nasal polyposis.⁽²⁰⁾

The literature corroborates that the differential diagnosis of nasal polyposis also includes an evaluation of nasal tumors. In fact, most of these lesions are unilateral, immobile, painful or bleed when manipulated. However, these lesions do not have the same character as the pathology in question. NP is typically

bilateral, non-sensitive and non-bleeding upon examination.

Therefore, the treatment for Chronic Rhinosinusitis with Nasal Polyposis can be divided into clinical and surgical treatment. The main objectives of the treatments are to eliminate the symptoms due to polyps and rhinosinusitis, to establish nasal breathing and smell, and to prevent the recurrence of polyps.

In surgical treatment, the main objective of surgery is to restore the physiological properties of the nose, removing polyps and reestablishing drainage of the paranasal sinuses, with the aim of improving sinonasal symptoms - nasal obstruction, congestion, hyposmia, anosmia and hypersecretion; as well as reducing the number of infections and recurrences. Intranasal surgical techniques have the advantage of direct visualization, favoring the selectivity and precision of the surgical procedure^(22, 27).

Thus, it is justified that the incorporation of evaluation practices in the implementation of surgical practices with the aim of establishing improvements in the olfactory pattern resulting from NP through the restructuring of nasal properties is a necessity that appears in medical practices, since evaluating the performance of the olfactory function in the post-surgical period is a relevant initiative for ENT professionals and for the general population who undergo the surgical procedure.

Thus, the aim of this study is to review the literature on the evaluation of the olfactory pattern after endoscopic nasal surgery in patients with Chronic Rhinosinusitis with Nasal Polyposis. Since this disease directly entails high costs to public health, there are also indirect costs involved, such as decreased productivity and increased absenteeism⁽²⁾.

METHODOLOGY

The research interest was based on a literature review of sources from the Otorhinolaryngology specialty on olfactory evaluation in the postoperative period of chronic rhinosinusitis with nasal polyposis. The Medline databases were used - via Pubmed, SCIELO and the Virtual Health Library (BVS). The strategy of Decs and MeSH terms and keywords related to nasal polyposis, Connecticut Chemosensory Clinical Research Center test and olfactory pattern was applied to expand the scope and relevance of the studies found. Original articles, systematic reviews and meta-analyses published in recent years were considered, ensuring the current information. The selected studies were subjected to a detailed analysis, with extraction of relevant data, such as authors, year of publication, evaluation of the olfactory pattern in the postoperative period of chronic rhinosinusitis with nasal polyposis reported. Relevant indexed terms for the search include “nasal polyposis”, “chronic rhinosinusitis”, “surgical treatment”, “olfactory pattern”.

The inclusion and exclusion criteria were strictly applied during the selection of articles and studies. Research that specifically addressed the evaluation of the olfactory pattern in the postoperative period of chronic rhinosinusitis with nasal polyposis in patients of all ages was included. Studies that were not available in full, categorized by duplication of the main subject, and those that did not directly address the proposed theme or that were not written in English or Portuguese were excluded.

RESULTS

According to Drummond *et. al.* (2020)⁽¹⁴⁾, the management of Chronic Rhinosinusitis with Nasal Polyposis requires a multifaceted approach, integrating pharmacological and non-pharmacological methods. Since treatment methods vary according to the severity of the condition, until the surgical procedure is indicated.

In most cases, the predominant approach is clinical, involving the use of topical or systemic medications.^(14,30) It is known that, to date, corticosteroids administered topically in the nose or systemically are the most effective drugs known for the treatment of nasal polyposis.

Systemic corticosteroids act to improve the olfactory pattern, are effective in reducing polyps, but cause serious and well-known side effects if used for a long time.⁽⁷⁾ Topical corticosteroids have been widely studied, as they reduce the size of polyps and improve nasal breathing, but are not effective in improving the sense of smell or sinusitis. Therefore, due to their safety, topical steroids for long periods can be used successfully in cases of less extensive polyposis.⁽²³⁾

However, knowing that long-term clinical treatment is effective but can have significant side effects, the time to indicate nasal polyposis surgery must be well defined together with the patient. In general, clinical treatment must be administered for at least three months and, when there is no improvement in symptoms, characterizing therapeutic failure, in the presence of adverse effects and low adherence to clinical treatment by the patient, surgery must be indicated (BACHERT *et.al.*, 2006).⁽³⁾

In this context, surgical predominance over olfactory evaluation of the clinical condition of CRSwNP is a matter of controversy. According to the studies pointed out by Blomqvist *et. al.* (2004)⁽⁴⁾ did not show any change in the sensory condition of smell between the nasal

cavities of patients undergoing the surgical procedure and clinical treatment. And the study by Damm *et. al.* (2002)⁽¹¹⁾ demonstrated an 85% improvement in quality of life, with clinical improvement occurring in 76.4%, and hyposmia was the symptom that persisted after surgery.

However, studies by Alobid *et. al.* (2005)⁽¹⁾ revealed that patients who underwent surgical treatment presented better scores in quality of life questionnaires in relation to hyposmia when compared to the group that underwent only clinical treatment in analysis of this sensory indicator.

In addition, several studies confirm the general improvement in quality of life in patients with CRSwNP who underwent endoscopic surgery, with follow-up of up to 3 years.

Thus, the efficacy of sinonasal surgery for improving nasal polyposis has been shown to be effective in all studies that compared it with clinical treatment and, therefore, surgery must be considered one of the therapeutic options for treating nasal polyposis, since the efficacy of radical ethmoidectomy in controlling the recurrence of complaints, improving function and reducing the need for revision surgery is effectively demonstrated. However, for many authors, the radical option also means amputation of at least an important part of the olfactory apparatus.^(18,24)

DISCUSSION

To define the surgical plan for Chronic Rhinosinusitis with Nasal Polyposis together with the patient is of great value, since it is necessary to clarify the surgical options according to the extent of the surgery and the pathology and cause of hyposmia. Nasal endoscopic surgery (FESS) is currently considered the gold standard in the treatment of chronic rhinosinusitis (CRNS), associated or not with nasal polyposis, refractory to

optimized clinical treatment. This surgery is based on the principles of improving the function and patency of the osteomeatal complexes (OM), through interventions on the lateral wall of the nose.⁽²⁵⁾

Firstly, it is known that a less radical surgery has a lower probability of effectiveness and a higher rate of recurrence with formation of nasal polyps and a case series of surgical reintervention. However, a more radical intervention, undergoing complete ethmoidectomy, implies a potential risk of persistent hyposmia, or even postoperative anosmia, and such a decision regarding the extent of surgery must be shared with the patient regarding the expectations of disease control and resolution of hyposmia. Since, if the patient's concern is exclusively the restoration of smell, he or she may understandably choose to refuse radical surgical treatment.

And to clarify the hyposmia factor, this symptom has two causes: the mechanical obliteration of the olfactory epithelium by the polyps, which prevents the passage of air through the olfactory receptors; and the alteration of the mucosa due to chronic inflammation that reduces its sensory function.⁽¹⁹⁾

CONCLUSION

Overall, the impact of chronic rhinosinusitis with nasal polyposis on the context of quality of life is gigantic when compared to the quality of life of chronic heart failure.⁽¹⁷⁾ And it is equally known that this impact presents a significant improvement with the surgical procedure, even when each symptom is analyzed separately.⁽⁸⁾ However, hyposmia is a symptom that improves positively with surgery, and is also very common, occurring in approximately 65% to 80% of CRSwNP⁽²¹⁾. This being confirmed with the application of the CCCRC Test adapted for Brazil, the studies aim to observe the olfactory threshold and the pattern of pre and post-surgical anosmia and hyposmia.

As a rule, Chronic Rhinosinusitis with Nasal Polyposis has a surgical indication when maximum drug therapy has failed; it is an option to alleviate symptoms and the negative impact on quality of life, but its extent is subject to controversy, with a more radical surgery controlling the disease better with fewer relapses, but has a greater potential for compromising the sense of smell.⁽¹⁶⁾

Furthermore, in CRSwNP, the sense of smell is often significantly affected, with hyposmia being one of the most reported complaints, as we saw above, and, naturally, the patient wants this symptomatology to be resolved along with the others. Therefore, evaluating surgical practices with the aim of establishing an improvement in the olfactory pattern resulting from CRSwNP through the restructuring of nasal properties is a necessity that appears in medical practices and these new studies must be implemented to establish better confirmatory biases for intervention in quality of life, as well as olfactory.

REFERENCES

1. Alobid I, Benítez P, Bernal-Sprekelsen M, et al. **Nasal polyposis and its impact on quality of life: comparison between the effects of medical and surgical treatments.** *Allergy*. 2005; **60**: 452-458.
2. Anand VK. **Epidemiology and economic impact of rhinosinusitis.** *Ann Otol Rhinol Laryngol Suppl*. 2004;193:3-5.
3. Bachert C, Watelet JB, Gevaert P, Van Cauwenberge P. **Pharmacological management of nasal polyposis.** *Drugs* 2005;65(11):1537-52.
4. BLOMQVIST, Ebba et al. **Consequences of olfactory dysfunction for life quality and adopted coping mechanisms.** *Rhinology*, [s. l.], v. 42, n. 4, p. 189–194, 2004. Disponível em: <https://www.rhinologyjournal.com/Abstract.php?id=455>. Acesso em: 18 fev. 2024.
5. Breer H. Sense of smell: recognition and transduction of olfactory signals. *Biochem Soc Trans*. 2003;31(1):113-6.
6. Caplin I, Haynes JT, Spahn J. **Are nasal polyps an allergic phenomenon?** *Ann Allergy* 1971;29: 631-4.
7. Castro Jr., N. P; Taciro, E. K.; e Freitas, L. P S. - **Síndrome de Jartagener: Considerações sobre um caso clínico.** *Rev Bras Otorrinolaringol*, 64(2): 137-141, 1998.
8. Chester AC. **Symptom outcomes following endoscopic sinus surgery.** *Curr Opini Otolaryngol Head Neck Surg*. 2009;17:50-8.
9. Couto LGE, Fernandes AM, Brandão DF, Neto DS, Valera FCP, Lima WTA. **Aspectos histológicos do pólipos rinossinusal.** *Rev Bras Otorrinolaringol*. 2008;74(2):207-12.
10. Danielsen, A.; e Olofsson, J. - **Endoscopic endonasal sinus surgery A long-term follow-up study.** *Acta Otolaryngol. (Stockh)*, 116:4, 611-9, 1996.
11. Damm M, Quante G, Jungehuelsing M, Stennert E. **Impact of functional endoscopic sinus surgery on symptoms and quality of life in chronic rhinosinusitis.** *Laryngoscope* 2002;112(2):310-5.
12. Demery RA. **Aplicação de análises estatística e neural para reconhecimento de sinais de odores.** Recife: UFRPE, 2007, p. 191. (Dissertação de mestrado em Biometria - Departamento de Estatística e Informática, Universidade Federal Rural de Pernambuco).
13. **Diretrizes Brasileiras de Rinossinusites.** *Rev. Bras. Otorrinolaringol.*, São Paulo, v. 74, n. 2, supl. p. 6-59, 2008 . Available from <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-72992008000700002&lng=en&nrm=iso>. access on 25 Mar. 2024.
14. DRUMMOND, R L et al. **Contagem de micronúcleos em células epiteliais nasais de pacientes com rinossinusite crônica e pólipos.** *Brazilian Journal of Otorhinolaryngology*, v. 86, p. 743-747, 2020.
15. Doty RL. **The olfactory system and its disorders.** *Semin Neurol*. 2009;29:74-81.
16. Fokkens WJ, Lund VJ, Mullol J, Bachert C, Alobid I, Baroody F. **European Position Paper on Rhinosinusitis and Nasal Polyps 2012.** *Rhinol Suppl*. 2012;1-298.
17. Gliklich RE, Metson R. **The health impact of chronic sinusitis in patients seeking otolaryngologic care.** *Otolaryngol Head Neck Surg*. 1995;113:104-9.
18. Jankowski R, Pigret D, Decroocq F, Blum A, Gillet P. **Comparison of radical (nasalisation) and functional ethmoidectomy in patients with severe sinonasal polyposis. A retrospective study.** *Rev Laryngol Otol Rhinol*. 2006;127:131-40.

19. Jankowski R, Bodino C. **Olfaction in patients with nasal polyposis: effects of systemic steroids and radical ethmoidectomy with middle turbinate resection (nasalization).** *Rhinology.* 2003;41:220-30.
20. Johansson L, Akerlund A, Holmberg K, Melen I, Bende M. **Prevalence of nasal polyps in adults: the Skovde population-based study.** *Ann Otol Rhinol Laryngol.* 2003;112(7):625-9.
21. Kaliner MA, Osguthorpe JD et al. **Sinusitis: bech to beside- current findings, future directions.** *J Allergy Clin Immunol* 1997;99: S829-S48.
22. Klossek, J. M.; Peloquin, L.; Friedman, W H.; Ferrier J. C.; e Fontanel, J. P - **Diffuse nasal polyposis: postoperative long-term results after endoscopic sinus surgery** *Otolaryngol., Head Neck Surg.,* 117:4, 355-61, 1997.
23. Larsen, K.; e Tos, M. - **A long-term follow-up study of nasal polyp patients after simple polypectomies.** *Eur Arch Otorhinolaryngol Suppl. 1.,* S85-8, 1997.
24. Masterson L, Tanweer F, Bueser T, Leong P. **Extensive endoscopic sinus surgery: does this reduce the revision rate for nasal polyposis?** *European archives of oto-rhino-laryngology.* 2010;267:1557-61.
25. Messerklinger W, **Endoscopy of the nose.** Munich: Urban & Swarzenberg; 1978:49- 50
26. Miyake MAM, Voegels RL. Polipose Nasossinusal. *Tratado de Otorrinolaringologia.* São Paulo: Roca, 2002.
27. Mygind, N.; e Lildholdt, T - **Nasal polyps treatment: medical management.** *Allergy Asthma Proc,* 17:5, 275-82, 1996.
28. Neto FP, Targino MN, Peixoto VS, Alcântara FB, Jesus CC, Araújo DC, et al. **Anormalidades sensoriais: olfato e paladar.** *Int Arch Otorhinolaryngol.* 2011;15:350-8.
29. Newton JR. **A review of nasal polyposis.** *Ther Clin Risk Manag.* 2008; 4 (2): 507-12.
30. Valera FCP, Anselmo-Lima WT. **Evaluation of Efficacy of Topical Corticosteroid for the Clinical Treatment of Nasal Polyposis: Searching for Clinical Events that may Predict Response to Treatment.** *Rhinology.* 2007;45(1):59-62.
31. PIGNATARI, Shirley Shizue Nagata (Org.); ANSELMO-LIMA, Wilma Terezinha (Org.). **Tratado de otorrinolaringologia.** 3a ed. Rio de Janeiro: Elsevier, 2018. 991 p.
32. Trittel, C.; Möller, J.; Euler, H. H.; e Werner, J. A. - [ChurgStrauss syndrome. **A differential diagnosis in chronic polypoid sinusitis**] *Laryngorhinootologie,* 74:9, 577- 80, 1995.