Current Perspective of Diagnostic and Treatment of Rhinitis

Lovenita Visca Karenina[1], Agustina Tri Pujiastuti[1]

[1]Faculty of Medicine Universitas Pembangunan Nasional Veteran Jawa Timur

Corresponding Author

Lovenita Visca Karenina

Faculty of Medicine Universitas Pembangunan Nasional Veteran Jawa Timur

Rungkut Madya Street Number 191, Rungkut Kidul, Rungkut District, Surabaya, Jawa Timur 60293

Tel/Fax : +6287838067337

Email : 24091010023@student.upnjatim.ac.id

Abstract

Background: Rhinitis is an inflammation or irritation of the nasal mucosa that characterized by symptoms such as runny nose, nasal congestion, and sneezing. This condition can also be caused by inflammation of eyes, ears, and throat.

Objective: To review the literature on vasomotor rhinitis, allergic rhinitis, the relationship between rhinitis and students' quality of life, and rhinitis in sports athletes.

Methods: This literature review was conducted by selecting a topic and determining keywords for journal searches using English and Indonesian through several databases including Google Scholar and NCBI Bookshelf.

Results: This literature review shows that vasomotor rhinitis and allergic rhinitis have different causes and treatments, although both show similar symptoms.

Conclusion: This literature review shows that vasomotor rhinitis and allergic rhinitis have different causes and treatments, although both show similar symptoms.

Keywords: Allergic rhinitis, vasomotor rhinitis

Introduction

Allergic rhinitis is such a common disease. In the world, there are likely 20-30% people who are affected. In Indonesia, allergic rhinitis prevalence is likely 1,5-12,4%.[1] In paediatrics, rhinitis prevalence is more common in boys. In adults, male and female have equal prevalence.[2]

Non-allergic rhinitis (NAR) refers to chronic symptoms such as nasal congestion and rhinorrhoea that are not related to a specific allergy. A study conducted in 2023 stated that the etiology of vasomotor rhinitis is not clearly understood, suspected to be related to irregularities in the sympathetic, parasympathetic, and nociceptive nerves located in the nasal mucosa.[3]

Allergic rhinitis (AR) is an atopic disease that characterized by symptoms such as sneezing, nasal congestion, pruritic nasal, and clear rhinorrhoea. The allergic response is grouped into early and late reaction phases. In the early phase, allergic rhinitis is an immunoglobulin E (IgE) response against inhaled allergens that causes inflammation due to type 2 helper (Th2) cells. The early response occurs within 5-15 minutes after antigen exposure that causes mast cell degranulation. This process releases a variety of newly formed synthetic mediators, including histamine, which is one of the primary mediators of AR.[4]

The purpose of this literature review is to provide a comprehensive understanding of the etiology, management methods, and prevention of rhinitis. My understanding the basic mechanisms and factors causing rhinitis, it is hoped that more effective and personalized management strategies can be developed to improve the quality of life for patients with rhinitis.

Methods

The research method used is a literature review using electronic databases through journals from national and international sources such as NCBI Bookshelf and Google Scholar. The inclusion criteria used by the author is by limiting articles or journals published in the last five years from 2019-2024.

Discussion

The journal titled “Vasomotor Rhinitis” by Preston Leader and Zachary Geiger, published in 2023 explains the causes of vasomotor rhinitis as well as how to diagnose and treat it. The journal titled “Allergic Rhinitis” by Shweta Akhouri and Steven A. House, published in 2023 explains how allergic response occurs, how to diagnose patients with AR through physical examination, what medication should be given, diagnostics exclusions for certain group of people, recent studies related to AR, and how to improve medical services for patients. The journal titled “Relationship between Allergic Rhinitis to Quality of Life of Students of Faculty of Medicine Universitas Sumatera Utara Batch 2018” by Anna Delinda and Andrina Rambe, published in 2022 discusses the definition of AR and the research methods used in that study. The journal titled “Exercise and Rhinitis in Athletes” by Pavol Surda et al. which is published in 2019 discusses the prevalence of rhinitis among athletes,

pathophysiology, the impact of intense trainings on athletes with rhinitis, quality of life for athletes with rhinitis, diagnosis, and appropriate treatment for athletes with rhinitis. The journal on Allergic Rhinitis compiled by Jean Bosquet et al. which is published in 2020 explains the causes of AR, prevalence in several countries, risk factors and classification of AR, as well as the pathophysiology scheme of AR.[3-7]

Allergy, also known as type 1 hypersensitivity is a result from the activation of the Th2 subset of CD4+ helper T cells by environmental antigens. This leads to the production of IgE, which binds to the surface of mast cells. When IgE molecules bind to an allergen, mast cells are triggered to release mediators that affect vascular permeability and cause smooth muscle contraction in various organs, also extending inflammation. Once an allergen enters body tissues, vascular changes manifest as increased secondary blood flow. This is followed by heightened vascular permeability due to the widening gaps between venous endothelial cells. Next, leukocytes perform phagocytosis and eliminate the allergen. The activity of these leukocytes can lead to three possible results: resolution (the damaged tissue returns normal), transition to chronic inflammation, or fibrosis.[8]

Allergic rhinitis is diagnosed by medical interview related to symptoms that patient feels, nasal allergic reaction by NAPT, and skin prick test. Usage of oral H1-antihistamine is not recommended to children with nasal allergy and/or history of allergy in family.[9]

Immunity is resistance to disease. The combination of cells, molecules, and tissues involved in immunity are immune system. Eosinophils are one of the leukocytes that consist whole blood. Eosinophils have a bilobed nucleus and cytoplasm containing about 200 granules filled with enzymes and proteins that play a role in the inflammatory process. Eosinophils are involved in the inflammatory response die to allergies. In healthy individuals without allergies, eosinophils in the blood are likely 2-5%. Eosinophils can be phagocytes into body tissues. Eosinophils can also be triggered to degranulate and release mediators. They contain various granules, such as MBP, ECP, EDN, and EPO, which are toxic and able to destroy target cells when released. Eosinophils reside in the lamina propria of the GI Tract. They are regulated by IL-5, IL-13, and other immune cell cytokines.[10]

ADVANTAGES AND DISADVANTAGES

The journal titled “Vasomotor Rhinitis” by Preston Leader and Zachary Geiger, published in 2023 explains more about the etiology and treatment of vasomotor rhinitis; however, its causative factors are less discussed. The journal written by Jean Bosquet et al. which is

published in 2020 provides sufficient discussion, and lack of explanation about the research methods used.

CONCLUSION

The cause of vasomotor rhinitis is not yet clearly known. It is suspected to be caused by dysregulation between sympathetic, parasympathetic, and nociceptive nerves innervating the nasal mucosa. Avoiding environmental triggers such as perfumes, cigarette, and cleaning agents helps reduce symptoms that arise. AR is caused by exposure to inhaled allergens that triggers Th2 cells leading into inflammation. Avoiding allergens is necessary for patient with seasonal symptoms, even though it is not always easy to practice. Vasomotor rhinitis and allergic rhinitis have similar symptoms; however, their treatment differ. From existing research, the author concluded that both types of diseases could affect the quality of life of the patients.

References

1. Hafshah. Terapi komplementer rinitis alergi. Jurnal Medika Hutama [Internet]. 2021. Available from: http://jurnalmedikahutama.com
2. Kolegium Dokter Indonesia. Modul Dasar Penguatan Kompetensi Dokter di Tingkat Pelayanan Primer [Internet]. 2024. Available from: https://kdi-idi.or.id/2024/08/01/rhinitis/
3. Leader P, Geiger Z. Vasomotor rhinitis. [Updated 2023 Jul 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. Available from: https://www.ncbi.nlm.nih.gov/books/NBK547704/
4. Akhouri S, House SA. Allergic rhinitis. [Updated 2023 Jul 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538186/
5. Delinda A, Rambe A. Relationship between allergic rhinitis to quality of life of students of Faculty of Medicine Universitas Sumatera Utara Batch 2018. Sumatera Med J. 2023;6(1). https://doi.org/10.32734/sumej.v6i1.7996
6. Surda P, Tornari C, Putala M, Walker A. Exercise and rhinitis in athletes. EMJ. 2019;4(3):120–6.
7. Bousquet J, Anto JM, Bachert C, Baiardini I, Bosnic-Anticevich S, Canonica GW, et al. Allergic rhinitis. Nat Rev Dis Primers. 2020;6(1):95.

8. Kumar V, Abbas AK, Aster JC. Robbins Basic Pathology. Philadelphia: Elsevier Inc.; 2013.
9. Terada T, Kawata R. Diagnosis and treatment of local allergic rhinitis. Pathogens. 2022;11(1):80.
10. Baratawidjaja KG, Rengganis I. Imunologi Dasar Jilid 1. Jakarta: Universitas Indonesia Publishing; 2022.