

STENCEL, Katarzyna, STELMASZAK, Karina, WOJTASIK, Monika, OGIEGŁO-KOWALCZYK, Aleksandra, SAMBORSKA, Julia, WIĘCKOWIAK, Paweł, GŁODZIK, Michał, MIŚKIEWICZ, Marek, ŁĘCKA, Martyna and ŻAK, Katarzyna. Rhinophyma - the end-stage of rosacea. Journal of Education, Health and Sport. 2024;54:58-66. eISSN 2391-8306. <https://dx.doi.org/10.12775/JEHS.2024.54.005> <https://apcz.umk.pl/JEHS/article/view/47876> <https://zenodo.org/records/10534441>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of 05.01.2024 No. 32318. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical culture sciences (Field of medical and health sciences); Health Sciences (Field of medical and health sciences).

Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 05.01.2024 Lp. 32318. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przypisane dyscypliny naukowe: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu). © The Authors 2024;

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Received: 06.01.2024. Revised: 17.01.2024. Accepted: 17.01.2024. Published: 19.01.2024.

Rhinophyma - the end-stage of rosacea

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Abstract

Introduction: Rhinophyma is defined as a progressive, deforming, nodular enlargement of the sebaceous glands caused by hypertrophy of the sebaceous follicles. It is assumed to be the final phase of chronic rosacea occurring mainly in Caucasian men. This disease negatively affects the quality of life of patients due to decreased self-esteem and depressive disorders. Nasal deformation by narrowing the nostrils impairs the physical performance of patients and even leads to the development of sleep apnea. Treatment is mainly based on surgery to remove pathological tissue. The literature also provides the possibility of therapy using ablative techniques and laser therapy.

Aim of study: To review the current literature about rhinophyma, epidemiology, pathophysiology and treatment of this condition

Materials and methods: This review was based on available data collected in the PubMed database ,using the keywords:'rhinophyma', "rosacea",'rosacea treatment','rhinophyma treatment"

Summary: Rhinophyma is the most advanced form of rosacea, resulting from delayed treatment of the initial stages of the disease such as erythema, papular

and pustular lesions. Permanent inflammation leads to the hypertrophy of glandular tissue - sebaceous glands and connective tissue, resulting in a puffy nose, which, in addition to negatively affecting the patient's mental well-being, reduces performance, even leading to sleep apnea by reducing air flow through the nostrils. The most effective method of treating rhinophyma is surgery by removing the pathologically overgrown tissue. Surgeons often combine the surgical method with laser therapy, which allows for the best aesthetic effect.

Key words: "rhinophyma" "rosacea" "rhinophyma treatment" "rhinophyma epidemiology"

Introduction:

Rosacea is a chronic inflammatory skin disease that occurs most frequently in people of European descent with fair skin. [1,3,4] Inflammation affects the facial skin - nose, cheeks, forehead, chin, manifesting itself in episodes of redness, pustular and papular lesions and telangiectasia in various combinations and intensities, often varying between periods of exacerbation and remission. [1,2,3] Based on morphological features, four main subtypes of rosacea have been distinguished: erythematous-telangiectatic, papulopustular, hypertrophic and ocular.[3] The hypertrophic form - rhinophyma, or nasal tuberosity, is an unsightly manifestation of rosacea.[5] Permanent inflammation of the skin causes progressive overgrowth of the sebaceous glands and connective tissue in the distal part of the nose - usually affecting the lower two-thirds of the nose. [5,6] In the advanced stage, hyperemic, large nodular masses may appear, posing a risk of nasal obstruction and sleep apnea. Rhinophyma occurs mainly in men, and the age of onset ranges between 40 and 60 years of age. [6] This disease reduces the quality of life of patients by lowering self-esteem, increasing the incidence of

anxiety and depressive disorders and breathing problems, because the thickening of the nostrils can block the flow of air through the nostrils. [6,7]An additional social challenge is the commonly alleged association with excessive alcohol consumption in people suffering from rhinoplasty. A direct causal relationship between rhinophyma and alcohol has not yet been substantiated, but it has caused social stigma.[8,9]

Epidemiology

The prevalence of rosacea in the adult population worldwide is 5.5% - slightly more common in women than in men.[10] Interestingly, the nodular form of rosacea - rhinophyma, most often occurs in white men over the age of 50, of Caucasian origin - in the literature it has been reported in men of Asian or African-American origin, but it is a rare phenomenon. [11] In one study of 108 patients with rosacea, only 15 patients had nasal tuberosity, and almost all were men.[12] There is a hypothesis that the influence of androgens predisposes to the development of rhinophyma in men. [11]

Pathophysiology

The mechanisms of rosacea development are still unclear - the literature emphasizes multifactorial pathogenesis with a genetic predisposition [14]. Many triggers are thought to be responsible for initiating or exacerbating the disease, such as exposure to ultraviolet (UV) radiation, local inflammatory response to skin microorganisms (related to Demodex infestation), changes in temperature, hot, cold, spicy foods, and stress. Rosacea usually begins at the age of 20-30 with telangiectasia, excessive facial redness, intensified by vasoactive substances - caffeine, alcohol and UV light [13]. The main pathomechanism of nasal tuberosity is the dilation of blood vessels and chronic inflammation. Under the influence of triggering factors, blood vessels increase their permeability, causing fluid to accumulate in the interstitial space, promoting inflammation. The initiation of the inflammatory reaction leads to the activation of NF-kB, followed by the production of inflammatory cytokines and the influx of mast cells and macrophages. Mast cells further enhance vasodilation and angiogenesis by producing vascular endothelial growth factor (VEGF) and fibroblast growth factor (FGF), increasing vascular permeability and edema. Under the influence of the above cascade of

inflammatory reactions, there is a progressive proliferation and then hyperplasia of the sebaceous glands and connective tissue, and the formation of a large, bulbous, erythematous nose - known as rhinophyma.[15]

Treatment of rhinophyma

Unlike rosacea, which is treated with conservative methods - oral isotretinoin therapy or antibiotic therapy, rhinophyma requires radical therapy. [16] The literature emphasizes that surgical methods are the most effective in the treatment of nasal tuberosity, thanks to the reduction of overgrown connective tissue and sebaceous glands and the restoration of the correct shape of the nose. Additionally, the resected tissue is sent for histopathological evaluation to exclude malignant tumors, such as basal cell carcinoma or squamous cell carcinoma, which are common in this condition. This is not possible with ablative techniques due to the complete destruction of the tissue.[17]

Two methods are used in the surgical treatment of nasal tuberosity - complete removal of pathological tissue with reconstruction using a skin flap, or partial tissue resection. The first method provides the benefits of immediate coverage of the open wound, avoids excessive heat damage, and eliminates the risk of recurrence by removing all pathological tissue, including the tumor. Partial tissue removal allows for preservation of the pilosebaceous unit, but there is a high risk of scarring if the underlying tissue is unintentionally removed due to the difficulty of achieving hemostasis to ensure a clear field of vision. It is often necessary to use electrocautery to stop bleeding and additional nasal profiloplasty. [21] Electrosurgery and cryoablation are used in the ablative treatment of hypertrophic rosacea. Electrosurgery is a method in which radiofrequency electrical energy is used to destroy hypertrophic tissue using a wire loop.[9] This method, however, is burdened with a high risk of postoperative scars and necrosis due to the intense heating of the skin and cartilage tissue by thermal energy. Safer, unlike electrosurgery, which is irreversible, is cryoablation - which involves the removal of tissue epithelium at a low temperature.[18] Another therapy used to treat rhinophyma is laser therapy. Initially, an argon laser was used, but due to the inability to determine the depth of tissue destruction, this therapy was abandoned and the argon laser was replaced by a CO2 laser. The CO2 laser is often used as an adjunct in surgical procedures to remove excess glandular tissue. Using a

wavelength of 10,600 nm, it penetrates to a smaller depth - 0.5 mm - than an argon laser, which reduces the risk of excessive tissue damage.[21]

Conclusions:

Rhinophyma is an advanced stage of rosacea of the soft tissues of the nose. The disease causes progressive disruption of nasal architecture and airway obstruction. Patients may be afraid to go out in public for fear of social stigmatization because rhinophyma has been wrongly associated with alcoholism. Although there is no cure for rhinophyma, understanding of the disease has improved and many treatment options exist. The most effective method of treating rhinophyma is surgery, which involves the removal of pathologically overgrown tissue. Surgeons often combine the surgical method with laser therapy to achieve the best aesthetic results.

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All authors have read and agreed with the published version of the manuscript

Funding: This research received no external funding

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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