sinusitis

MDPI

Commentary

The Impact of Churg–Strauss Syndrome on Nasal Function and Quality of Life: An Underexplored Dimension

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Abstract: Eosinophilic Granulomatosis with Polyangiitis (EGPA)/Churg–Strauss syndrome is a systemic vasculitis that often causes chronic nasal dysfunction, including anosmia, nasal obstruction, and sinusitis. Anosmia, affecting up to 20% of EGPA patients, has a significant negative impact on quality of life (QoL). The loss of smell disrupts daily activities, reduces enjoyment of food, and impairs social interactions, leading to feelings of isolation, depression, and anxiety. These psychosocial consequences, combined with persistent physical symptoms, contribute to a marked decline in overall well-being and are among the strongest predictors of poor QoL in EGPA patients. Early diagnosis and intervention are essential to mitigate these effects and improve patient outcomes. A multidisciplinary approach that combines pharmacological treatment, surgical options, and psychosocial support is critical to managing both the physical and emotional challenges of nasal dysfunction in EGPA. However, further research is needed to explore long-term management strategies, optimize therapeutic approaches, and better address the complex interplay between physical symptoms and QoL in EGPA patients.

Keywords: Churg–Strauss syndrome; quality of life; anosmia; EGPA

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1. Introduction

Eosinophilic Granulomatosis with Polyangiitis (EGPA)/Churg–Strauss syndrome is a systemic small vessel vasculitis characterized by multi-organ involvement, including the respiratory tract [1]. Nasal polyposis, chronic rhinitis, and sinusitis are frequent and debilitating features of EGPA [2], yet the impact of long-term consequences of nasal dysfunction, specifically the loss of olfactory function, on quality of life (QoL) remain largely unevaluated.

2. Pathophysiology of Anosmia in EGPA: Local and Systemic Mechanisms Impacting Nasal and Brain Function

Anosmia is a relatively common symptom in EGPA. Although its exact prevalence remains unclear, it can be one of the first symptoms to present in EGPA patients [3,4]. The pathophysiological mechanisms underlying anosmia in EGPA operate on two levels: locally, the chronic inflammation of the nasal mucosa, nasal polyps, and sinus obstruction lead to direct damage of the olfactory epithelium and an impaired capacity of sensory neurons to detect and transmit olfactory signals to the brain [5].

On a systemic level, the immune dysregulation characteristic of EGPA, driven by a type-2 helper T cell (Th2), B cells, and eosinophils response [6], leads to the production

of pro-inflammatory cytokines such as IL-4, IL-5, and IL-13. This complex inflammatory signalling path showed a significant correlation in a mouse model, with structural changes in the olfactory bulb (OB) reducing the total number of immature olfactory neurons despite not affecting mice's global olfactory behaviour [7].

This immune-driven alteration of the olfactory system may have broader effects on brain function and could contribute to an impairment of the brain's ability to process sensory input and respond to environmental stimuli, potentially exacerbating cognitive decline and emotional instability [8]. Furthermore, the disruption of olfactory input processing could impact brain regions involved in emotion regulation and memory, potentially intensifying the psychological and cognitive challenges that patients experience [9].

In addition to these neurobiological effects, the long-term consequences of nasal dysfunction in EGPA are not limited to physical symptoms. In patients with EGPA-related gastrointestinal involvement, pre-existing vulnerabilities to nutritional issues can be exacerbated by chronic anosmia, nasal obstruction, and recurrent sinusitis, which affect appetite and decrease eating satisfaction, potentially leading to nutritional issues [10,11] and further impacting psychological well-being and QoL [12,13].

EGPA has also been linked to autonomic nervous system dysregulation [14,15]. Chronic activation of the sympathetic nervous system associated with persistent stress overwhelms the normal regulatory function of the parasympathetic system, creating an autonomic imbalance that may exacerbate patients' susceptibility to affective disorders, including depression and anxiety [16].

3. Discussion

To date, steroids remain the cornerstone of treatment, even though long-term use can lead to nasal mucosal thinning, as shown in mice models, which could exacerbate olfactory symptoms and increase the risk of infection [17].

However, biologic therapies, such as anti-IL-5 agents, can be effective in reducing nasal polyps-related symptoms and improving nasal function, despite their long-term impact on preserving olfactory function still being unclear, with relapses being frequent after discontinuation [18,19].

Specifically, the reduction in eosinophil-driven inflammatory mechanisms [20] and eosinophil-secreted factors (such as Charcot–Leyden crystals, eosinophilic extracellular traps, and eosinophil-derived neurotoxin) [21] that may be induced by mepolizumab [22–24] could help prevent sensory neuron damage, remodelling of the olfactory mucosa, and ultimately olfactory dysfunction.

A multidisciplinary approach incorporating pharmacological, surgical, and psychosocial interventions is critical. Psychological counselling must be taken into consideration as a key tool to address the emotional and social challenges that accompany chronic nasal symptoms and anosmia.

Thus, while current treatments show promising results, further research and a more integrated, long-term approach are needed to optimize management strategies, ultimately improving both the physical and emotional well-being of patients with EGPA.

4. Conclusions

Further studies on the impact of EGPA on the olfactory system and its consequent effects on quality of life are necessary to better understand how this disease influences patients' overall well-being. These investigations are key to developing a more comprehensive understanding of the disease's broad effects, which can guide more effective treatment strategies.

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