

Tinnitus after administration of sublingual immunotherapy

SAGE Open Medical Case Reports

Volume 5: 1–3

© The Author(s) 2017

Reprints and permissions:

sagepub.co.uk/journalsPermissions.nav

DOI: 10.1177/2050313X17713150

journals.sagepub.com/home/sco

**Jacob Juel**

Abstract

Background/objectives: Sublingual immunotherapy was first described in 1986. Since then, its use has been increased as an alternative to subcutaneously administered immunotherapy in the treatment of allergic rhinitis. The most common side effects are of oropharyngeal and gastrointestinal in nature, for example, itching, swelling, irritation, ulceration of the oropharynx and nausea, abdominal pain, diarrhoea, and vomiting. More severe side effects are dominated by systemic and respiratory tract manifestations.

Results: In this clinical case, the author reports a right-sided transient tinnitus lasting for 48 h after administration of sublingual immunotherapy for house dust mite in allergic rhinitis.

Conclusions: This case provide important insights for clinical practice, as tinnitus has not been previously reported as a side effect of sublingual immunotherapy with house dust mite allergens.

Keywords

Sublingual immunotherapy, allergic rhinitis, side effects, tinnitus, ACARIZAX

Date received: 20 February 2017; accepted: 10 May 2017

Introduction

Allergen immunotherapy has traditionally been administered by subcutaneous injections, but regular injections for a period of 3–5 years are often required for efficacy. Conversely, sublingual immunotherapy (SLIT), first described in 1986,¹ is given as a tablet or a liquid extract. Since then, its use has been growing globally, representing an alternative to subcutaneously administered immunotherapy in the treatment of allergic rhinitis. The safety profile of SLIT is superior to that of subcutaneously administered immunotherapy, as side effects are less severe and frequent.² Furthermore, SLIT can be self-administered. The clinical efficacy in allergic rhinitis due to house dust mite (HDM) allergens is well established.^{3,4} Mild side effects are frequent primarily in the initial period of SLIT treatment and include both local and systemic manifestations. Anaphylaxis has been reported, but it is considered as extremely rare.⁵ The most common local side effects are of oropharyngeal and gastrointestinal in nature, for example, itching, swelling, irritation, ulceration of the oropharynx and nausea, abdominal pain, diarrhoea, and vomiting. Pruritus and itching of the ear canal have also been reported. Systemic side effects are dominated by respiratory tract manifestations, particularly rhinitis and asthma, but angioedema and urticaria may occur, although less frequently compared to local side effects.

Case study

The SLIT dosage regimen of the current case was initiated as one tablet a day (ACARIZAX 12 SQ-HDM, Dermatophagoides pteronyssinus and Dermatophagoides farinae 50%/50%; ALK-Abelló, Hørsholm, Denmark) for a planned 3 years. A 35-year-old male with known allergic rhinitis due to HDM (Dermatophagoides pteronyssinus specific IgE 11×10^3 IU/L), diagnosed using a radioallergen sorbent test, received the first tablet (ACARIZAX 12 SQ-HDM) at an outpatient facility. The dose was held sublingually for 1 min before any swallowing was permitted. The treatment was performed in the morning. During the first few minutes, only discrete oropharyngeal itching was present. After 30 min, the itching had subsided. However, 1 h post treatment, a debilitating right-sided, high-frequency, subjective buzzing noise with constant intensity started. The sound was independent of position of the head. There was no concomitant hearing loss. No exposure to loud, high noises was reported, and there was no history of use of

Department of Plastic Surgery, Aalborg University Hospital, Aalborg, Denmark

Corresponding Author:

Jacob Juel, Department of Plastic Surgery, Aalborg University Hospital, Sdr. Skovvej 3, DK-9000 Aalborg, Denmark.
Email: jacob.juel@rn.dk



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<http://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

portable music devices. The patient had not suffered from any recent respiratory tract infections, taken any concomitant medication, or experienced any head and neck traumas. A case-note review showed no preceding episodes of tinnitus, problems with the ears, or hearing loss. There were no psychiatric disorders or stress-related complaints. Furthermore, no temporomandibular joint problems were present. The patient had an examination at the Department of Ear, Nose, and Throat after symptom duration of 24 h, but no pathology was revealed. Hence, no obvious reason for the symptoms was found. The dosage regimen was upheld at one tablet a day during the period of tinnitus, and after 48 h, the buzzing sound spontaneously disappeared. At 6 months, no further episodes of tinnitus have been reported, and the SLIT therapy continues with good effect at recommended dosage regimen at one tablet a day. A review of his prescriptions showed great compliance to SLIT.

Discussion

Tinnitus is the debilitating subjective sensation of sound in the absence of actual acoustical stimulation.⁶ It can affect one or both ears and may be permanent, intermittent, or transient. Since otological conditions, particularly hearing loss, represent one of the most frequent causes of tinnitus, the auditory phantom sensations are often thought to be neuroplastic responses to sensory deprivation. The pathophysiology of tinnitus is intricate and not simply a correlate of the disproportion of firing patterns across the tonotopic pattern of the damaged cochlea, because the sound perception can persist even when input is eradicated by denervation of the auditory nerve. Although cochlear abnormalities could be the initial source of tinnitus, the subsequent neural changes centrally in auditory system is more likely to sustain the condition.⁷

Common causes of intermittent tinnitus include infection, for example, otitis media and mastoiditis, whereas sensorineural causes, for example, hearing loss, presbycusis, and noise exposure, are believed to be permanent in their nature. Furthermore, Ménière's disease and vestibular vertigo may also cause intermittent tinnitus. Mechanical causes like impacted cerumen, temporomandibular joint disorder, or otosclerosis are common; however, the latter is a permanent condition. Neurological diseases, such as migraine, multiple sclerosis, and epilepsy, may also play a prominent role in the cause of tinnitus, although only migraine is of intermittent character. Cardiovascular diseases, such as hypertension, could cause tinnitus, yet again, this would be permanent or at least long-standing until appropriate treatment is administered. Moreover, psychiatric disorders, for example, anxiety, depression, or emotional trauma, are often a cause of intermittent tinnitus. Analgesics, antibiotics, antineoplastic drugs,

corticosteroids, diuretics, immunosuppressive drugs, and non-steroidal anti-inflammatory drugs may cause pharmacologically induced tinnitus.^{6,8} A short escalation in dose could potentially circumvent the initial side effects; ACARIZAX is, however, only available in 12 SQ-HDM, but other SLIT products are also available. Taken together, the pathophysiological mechanisms of monosymptomatic transient tinnitus induced by SLIT with HDM allergen remain unknown, as none of the enumerated causes fit the current case. Mechanical distortion of the inner ear due to mild swelling of the mucosal membrane may provide a theoretical explanation.

Conclusion

The details of this case provide important insights for clinical practice, as tinnitus has not been previously reported as a side effect of SLIT with HDM allergens. Although side effects may occur, SLIT remains efficacious and safe. Informing patients receiving SLIT remains an important component of prescribing SLIT and should include information regarding risks of both local and systemic side effects including transient tinnitus.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

References

1. Scadding GK and Brostoff J. Low dose sublingual therapy in patients with allergic rhinitis due to house dust mite. *Clin Allergy* 1986; 16(5): 483–491.
2. Cox LS, Larenas Linnemann D, Nolte H, et al. Sublingual immunotherapy: a comprehensive review. *J Allergy Clin Immunol* 2006; 117(5): 1021–1035.
3. Compalati E, Passalacqua G, Bonini M, et al. The efficacy of sublingual immunotherapy for house dust mites respiratory allergy: results of a GA2LEN meta-analysis. *Allergy* 2009; 64(11): 1570–1579.
4. Jin JJ, Li JT, Klimek L, et al. Sublingual Immunotherapy Dosing Regimens: what is ideal? *J Allergy Clin Immunol Pract* 2017; 5(1): 1–10.

5. Van Dyken AM, Smith PK and Fox TL. Clinical case of anaphylaxis with sublingual immunotherapy: house dust mite allergen. *J Allergy Clin Immunol Pract* 2014; 2(4): 485–486.
6. Baguley D, McFerran D and Hall D. Tinnitus. *Lancet* 2013; 382(9904): 1600–1607.
7. Sanchez TG and Rocha CB. Diagnosis and management of somatosensory tinnitus: review article. *Clinics* 2011; 66(6): 1089–1094.
8. Cianfrone G, Pentangelo D, Cianfrone F, et al. Pharmacological drugs inducing ototoxicity, vestibular symptoms and tinnitus: a reasoned and updated guide. *Eur Rev Med Pharmacol Sci* 2011; 15(6): 601–636.