Case Report
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# A Case of Otomycosis Associated With a Sugar-Loaded Traditional Medicine Solution and Other Factors

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**Abstract**

**Objective.** The aim of this case report is to illustrate how multiple co-existing factors can contribute to otomycosis and to highlight possible new etiologies for this common condition. **Case Report.** We report the case of a woman with otomycosis in which a) several factors could have played an additive, contributing role, and b) with all other clinical parameters being equal (*ceteris paribus*) before and after otomycosis-specific treatment, a home-made, sugar-loaded medicinal solution could also have contributed to its pathogenesis. **Conclusion.** Our case highlights that traditional medicines must be used with caution since they might cause side-effects and that history-taking must include enquiry about their use. This case also highlights that a *ceteris paribus* approach can be useful when interpreting case reports, which lack the methodological robustness of case-control or interventional studies.

**Key Words:** Otomycosis ▪ Corticosteroids ▪ Psoriasis ▪ Fungal Otitis Externa ▪ Case Report.

## Introduction

Otomycosis is a common superficial fungal infection of the external auditory meatus that may present with various non-specific otologic manifestations such as aural fullness, pruritus, conductive hearing loss, and otorrhea (1). Occasionally, otomycosis may even cause perforations of the tympanic membrane (2). The most common causative organisms are *Aspergillus niger* and *A. tubingensis*, even though other fungi including *Candida* species (such as *Candida Auris*) (especially in children), *Mucor* species, *Rhizopus* species, *Scopulariopsis* species, *Alaromyces purpurogenus*, *Naganishia albida*, *Filobasidium magnum*, and *Saksenaea vasiformis* have also been observed (1, 3).

Here we describe the case of a woman who presented with otomycosis in which *a)* several factors could have played an additive, contributing role, and *b)* with all other clinical parameters being equal (*ceteris paribus*) before and after otomycosis-specific treatment, a home-made, sugar-loaded medicinal solution could have potentially contributed to its pathogenesis. Presenting this case allows us to: *a)* discuss factors that raise clinical suspicion for otomycosis and highlight that clinicians should be always aware of all potential risk and protective factors for otomycosis, *b)* present a hypothesis on a potential underlying cause, and *c)* remind practitioners that traditional medicines must be used with caution since they can result in adverse events, and, in doing so, emphasize that

enquiry about their use must be included when history taking (4).

The aim of this case report is to illustrate how multiple co-existing factors can contribute to otomycosis and to highlight possible new etiologies for this common condition.

## Case Presentation

A 66-year-old woman of European ancestry presented to a private ear, nose, and throat (ENT) practice describing an intense feeling of heaviness and blockage in the ears. She had a past medical history of *a)* mild psoriasis in the forearm and the elbow, *b)* Hashimoto's thyroiditis treated with levothyroxine, *c)* chronic diffuse alopecia, *d)* occasional osteoarthritic pain, and *e)* diphtheritis during childhood. She also had mild skin and ear psoriasis, which only affected the entrance to the external auditory meatus and not the canal itself, as well as recurrent episodes of excessive cerumen (earwax) and cerumen impaction requiring micro-suction by an ENT doctor.

Several weeks prior to presentation, she had been involved in restoring some furniture, which involved significant exposure to dust. Over the last three months, she had also experienced a relapse in skin and ear psoriasis, which was ascribed to anxiety and treated with topical corticosteroids in the form of ointment that was applied to the concha of the external auditory canal. Moreover, she had for some time been washing her hair at least twice a day with a home-made sugar-loaded medicinal solution made according to a regional traditional medicine recipe (home-made aloe vera solution mixed with crystal sugar and plain water) to treat her alopecia.

On examination, ear endoscopy revealed unilateral otomycosis of the external auditory canal in the right ear, with features entirely typical for the disease; namely, there was accumulation of debris containing dark-colored hyphae, mild erythema of the skin of the ear canal, and a small amount of watery discharge. However, the auricles were not affected. Fungal cultures or fungal potassium hydroxide stains were not performed taking into account both the patient's request and because the laboratory findings would not have affected treatment. Therefore, the patient was prescribed a two-week course of topical anti-fungal containing acetic acid, climbazole, licorice, essential oils, allantoin, and glycerol, and she was instructed to discontinue the sugar-loaded medicinal solution.

There were no other physical examination findings of note. On follow-up two weeks later, her ear symptoms and endoscopic features of otomycosis had resolved despite continuing with her furniture restorations. Although she continued to apply topical corticosteroids for her skin and ear psoriasis, she had discontinued using the traditional medicinal solution remedy. Even though not used to treat her otomycosis at that time, microsuction (ear toileting) was recommended to the patient if and when she felt the presence of earwax.

## Discussion

Here we present a case of otomycosis in which several factors may have contributed to its pathogenesis including: *a)* ear psoriasis, given that topical corticosteroids used for ear canal psoriasis are a risk factor for otomycosis (1); *b)* exposure to dust, which alongside its associated mycobiome (5) is another risk factor for otomycosis, especially in female patients undertaking housework (6), with our patient reported being in a particularly dusty environment prior to presentation; *c)* excessive cerumen; and, *d)* local humidity in the ear canal due to repeated hair washing in the moist environment of the shower, especially if not followed by adequate hair drying (1). We postulate that extensive hair washing (at least twice a day in this case) could have played a major role in the *ceteris paribus* sense (i.e., all factors being equal) because: *a)* despite the continued application of topical corticosteroids for ear psoriasis and continuing her house restorations after the otomycosis, there was no recurrence of otomycosis; *b)* according to the patient, the home-made solution contained a copious amount of sugar (described as *sweety* and *sticky*); and *c)* the otomycosis resolved after application of that solution was stopped. As a result, the

otomycosis may have, at least in part, been caused by the sugar-loaded solution. Indeed, systematically high glucose levels (such as in uncontrolled type 2 diabetes mellitus) are associated with fungal infections, as are locally high glucose concentrations such as in the bladder after treatment with SGLT2 inhibitors (7), which increase the risk of genital infections. Therefore, this home-made, sugar-loaded extract could have contributed to the patient's acute otomycosis, either through the effects of glucose in the solution or through contamination of the ear with fungi present in the non-sterile, home-made medicinal product.

Of note, even in the presence of other ear comorbidities such as ear psoriasis, a single dose of the antifungal clotrimazole is efficacious and cost-effective for otomycosis (8). Traditional medicines must be used with caution since they can result in adverse events (9), and enquiry about their use must be included when history taking. Since case reports lack the rigor of a case-control or interventional methodology, the *ceteris paribus* (i.e., all other factors being equal) approach is useful in their interpretation. From the patient's perspective, she felt reassured by the lack of recurrence of otomycosis and the explanation of the range of factors that might have played a role. She was therefore able to make adjustments to her lifestyle and daily tasks to mitigate against the risk of recurrence.

### *Limitations of Case Study*

Our case study has limitations: *a)* it is a single case report of a frequent pathology caused by multiple risk factors which are, however, combined in this case; *b)* a formal microbiological diagnosis was not made; and *c)* the duration of follow-up was relatively short.

## Conclusion

To our best knowledge, this is the first reported case of otomycosis in which a sugar-loaded medicinal solution could have in part contributed to the pathogenesis. Our case highlights that traditional medicines must be used with caution since they could potentially result in adverse events, and enquiry about their use must be included when history taking. This case also highlights that a *ceteris paribus* approach can be useful when interpreting case reports, which lack the methodological robustness of case-control or interventional studies.

**What Is Already Known on This Topic:**
*Otomycosis is a frequent disease encountered in ENT practice. To date, several risk factors for otomycosis have been identified including dust exposure, humidity, and topical corticosteroid use. However, there have not been any reports of the combined presence of risk factors or the contributing role of sugar-rich solutions.*

**What This Study Adds:**
*This study presents an intriguing example of otomycosis where several factor may have contributed to the disease pathogenesis. We also speculate that a home-made, sugar-loaded medicinal solution may have contributed, in part, to its pathogenesis by analogy with infections in other body systems. This case report also illustrates that a ceteris paribus approach can be useful when interpreting case reports.*

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**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Informed Consent:** Informed consent has been obtained from the patient for the publication of this case report.

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