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MICROBIOTA OF PRURITIC EARS IN KASHMIR, INDIA

Otorhinolaryngology

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ABSTRACT

AIM: To identify microflora of external auditory canal in patients with aural itching and to study susceptibility profiles of pathogenic organisms.
Materials & Methods: A total of 194 patients with aural itching were selected. An external auditory canal swab was taken. The samples were emulsified in different media for studying different organisms. Culture and sensitivity was done for the pathogenic organisms.
Results: Of the total 194 patients, 107 patients had no growth. Of the remaining 84 cases, 55 patients yielded aerobic bacteria and anaerobes were isolated in 04 cases. Of the aerobes isolated, coagulase negative staphylococcus was isolated from 31 patients, staphylococcus aureus from 17 patients and pseudomonas aeruginosa in 07. Fungi were isolated in 29 cases.
Conclusion: Our findings suggest that asteatosis should be considered an etiology in patients with pruritic ears after bacterial and fungal infections have been ruled out. Our study showed that a combination of a topical antibiotic/steroid and oral antihistamine is effective in alleviating the symptoms of pruritic ears.

KEYWORDS

Asteatosis; Microflora; Auditory Canal; Aural Itching

INTRODUCTION

The ear has external, middle, and inner portions. The outer ear is called the pinna and is made of ridged cartilage covered by skin. Sound funnels through the pinna into the external auditory canal, a short tube that ends at the eardrum (tympanic membrane).

The external auditory meatus is the passageway through the temporal bone and is coated in cerumen (earwax). The human external auditory canal extends from the pinna to the eardrum and is about 2.5 centimeters in length. It is the first important structure that helps in the transmission of sound[1]. The human external auditory canal is a stupendous structure with self-cleansing properties whereby the cerumen layer migrates outwards and sloughs externally. Instrumentation and excessive cleaning of the ear canal often predispose to infection.

The external auditory canal is directly exposed to various microbes and is a micro-environment in itself. It harbors various bacteria and the health of the external auditory canal is decided by the interplay of various factors like moisture, pH, cerumen and trauma to skin. The outer ear is protected by the skin and cerumen. The skin forms a physical barrier to the entry of pathogenic microbes, and cerumen, prevents tearing of the skin by means of lubrication and prevents microbial growth through the presence of antimicrobial proteins in it[2].

Both the auricle and the external auditory meatus house a variety of microbes under healthy conditions. The outer ear is exposed to the outside oxygen-filled environment, the majority of the bacterial flora on the auricle and in the external auditory canal is made up of aerobic species[3]. The outer ear is home to a diverse set of microbes including bacteria, viruses, and fungi[4]. Coagulase negative Staphylococcus, Staphylococcus aureus and Streptococcus pneumonia are the most common bacteria isolated from the external ear canals of healthy people. Corynebacterium species (Turicella otitidis and Corynebacterium auris) have also been isolated in various studies. The third most common recovered bacteria are Streptococci and Enterococci species[5].

The most common fungal agents causing otomycosis are Aspergillus Niger (80%), Candida Albicans (second most common), Actinomyces, Trichophyton, Aspergillus Fumigatus and Candida Tropicalis[6].

Infections of the ear may present with symptoms like ear ache, discharge, itching, fullness etc. While our ears may be fairly small compared to an arm or leg, they are full of sensitive neurological fibers. As a result, ears are subject to their fair share of itching. Itching is one of the most distressing symptoms of ear diseases. Itchy ears can feel irritating and bothersome. In our ENT OPD, we come across many patients in whom primary aural complain is persistent itching. While some of the patients have an underlying pathological cause to attribute to but in some no underlying cause can be ascertained.

The environmental conditions have a substantial impact on the development of external auditory infections. Warm, humid, and tropical climates increase the occurrence of ear infections. Acute diffuse otitis externa (swimmer's ear), chronic otitis externa, otomycosis and scalp lesions are some of the commonest diseases which predispose to itching of the ear[7]. Itching may also be associated with neurodermatitis and eczematous otitis externa. Removal of earwax can greatly increase the incidence of outer ear infections due to abrasions and the removal of the antimicrobial properties that accompany earwax.

The present study is undertaken to identify the microflora of external auditory canal in patients presenting with pruritic ears and to also study susceptibility profiles of pathogenic organisms to guide in appropriate management.

MATERIAL & METHODS:

This cross sectional study was done in 194 patients attending ENT OPD of Government Medical College, Srinagar, J&K, India with complaints of aural itching from October 2016 to April 2018. Written informed consent was taken from all the participating patients. Relevant history and demographic data (age,sex,place,occupation) was collected from the subjects.

Patients of both genders above the age of 12 years who presented with aural itching were included in this study. Patients with middle ear infections- active and inactive, patients with upper respiratory tract infections and patients with usage of topical ear drops less than 3 weeks were excluded from the study.

After conducting a detailed physical examination of the patients an external ear canal swab was taken. For recovery of bacteria, these samples were emulsified in a solution of BHI broth. Aerobic and anaerobic microbiology were studied. Bacterial colonies were identified via Gram-staining results, from the shape of the bacteria, and the appropriate diagnostic test results. Fungal microbiology was studied by KOH Mount and fungal culture. Culture and sensitivity was done for the pathogenic organisms.

RESULTS

The mean age of individuals participating in the study was 29.47±10.72.

In our study of 194 patients with aural itching, 55.15% patients (n= 107) were males and 44.84% (n=87) were females. Male to female ratio was 1.22:1.

Gender	No of Patients	Percentage (%)
Male	107	55.15
Female	87	44.84
Total	194	100

Table 1: Gender wise prevalence of aural itching

No growth was seen in 55.15% (n=107) patients **(Figure 1).** Only 04 (2.06%) anaerobes were isolated and included Proprionibacterium Acnes (n=03) and Peptococcus sp. (n=01) **(Figure 2).**

Out of the remaining 84 cases, 28.35 % (n=55) of the microflora was aerobic bacteria and in 14.94% (n=29) of the growth isolated was fungi. Of the aerobes isolated, coagulase negative staphylococcus was isolated from 31 patients, staphylococcus aureus from 17 patients and pseudomonas aeruginosa in 07 **(Figure 3).** Of the fungal species, aspergillus niger was isolated from 17 patients, candida was isolated from 09 patients and pencillium from 03 patients **(Figure 4).**

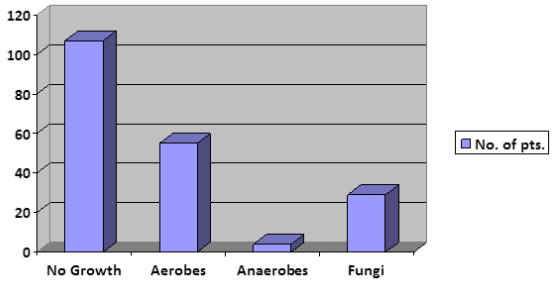

Figure 1: Type of Growth

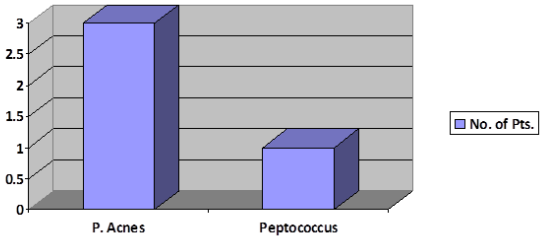

Figure 2: Anaerobic Growth

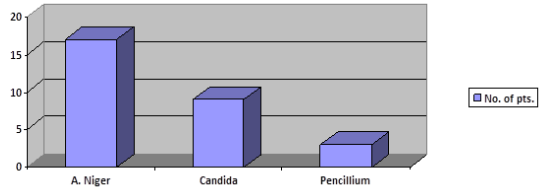

Figure 3: Aerobic Growth

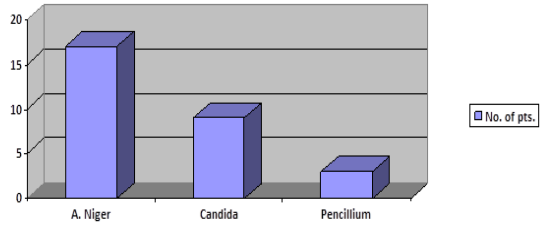

Figure 4: Fungal Growth

Culture and sensitivity was done for the aerobes and anaerobes. Coagulase negative staphylococcus being the normal commensal was excluded from culture and sensitivity. In cases with staphylococcus aureus, drug sensitivity was tested for amoxicillin, cefotaxime, clindamycin, gentamicin, methicillin, vancomycin, ciprofloxacin and erythromycin **(Figure 5).** In cases with Pseudomonas aeruginosa, drug sensitivity was tested for gentamicin, ceftazidime, imipenem, tobramycin, ciprofloxacin, vancomycin and amikacin **(Figure 6)**. In patients with anaerobes, drug sensitivity was tested for ciprofloxacin, cefoperazone, amoxicillin, imipenem, metronidazole and clindamycin **(Figure 7).**

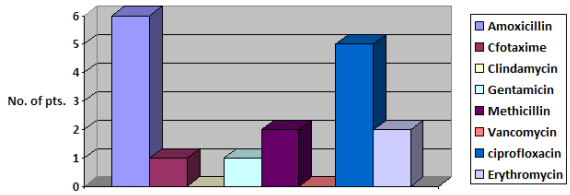

Figure 5: Drug Sensitivity for S.Aureus

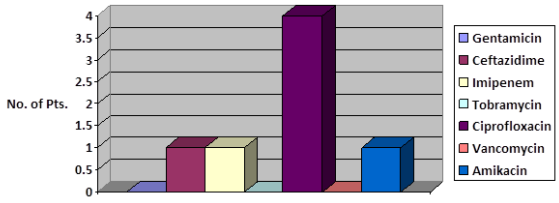

Figure 6: Drug Sensitivity for P. Aeruginosa

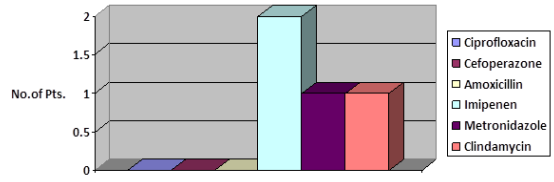

Figure 7: Drug Sensitivity for Anaerobes

DISCUSSION

Itching or pruritus of ear is an uncomfortable sensation that causes a desire to scratch and is associated with swelling, redness and scarring. Itching can be caused due to underlying bacterial or fungal infections or due to dryness of ear canal because of lack of cerumen (asteatosis).

Trauma resulting from use of instrumentation in itchy ears can predispose to bacterial and fungal infections of external auditory canal. Our study revealed that 55.15% patients had no growth and only had a dry canal skin without cerumen. This is attributed to a condition called "Asteatosis".

Asteatosis is a common condition of the external auditory canal where the skin surface is dry and lacks cerumen. Due to lack of cerumen, which is protective of the canal, there is a change in the pH of the canal which may make it more prone to external ear infections. The dryness of the canal skin leads to itching and subsequent scratching and irritation[8].

Karakus et al studied the microbiology of external auditory canal in patients with asteatosis and itching and evaluated the efficacy of topical 2% Alcohol and boric acid solution in patients with normal flora. They concluded that despite normal otoscopic findings, external auditory canal cultures may show pathogenic colonization in patients with asteatosis. Topical administration of alcohol and boric acid solution relieves itching in patients with normal flora[9].

In our study, 55 aerobes were isolated and among them coagulase negative staphylococci accounted for 31 cases, Staphylococcus aureus accounted for 17 cases and Pseudomonas aeruginosa accounted for 7 cases. All of our patients were treated with a combination of Polymyxin B sulphate, chloramphenicol and dexamethasone (Ocupol-Dx ear drops). Patients were also put on oral antihistamines.

The 7 cases in which pseudomonas were isolated were treated with ciprofloxacin (Ciplox) ear drops. The patients showed marked improvement after one month with no growth isolated on culture and sensitivity. The culture and sensitivity report suggested that topical ciprofloxacin drops is equally effective against both the aerobic pathogens grown in our study (Staphylococcus aureus and Pseudomonas aeruginosa).

In our study, fungi were isolated in only 29 cases as we excluded patients with history of topical ear drop usage. These patients were treated with a combination of ofloxacin, clotrimazole, beclomethasone dipropionate and lignocaine hydrochloride (Otiflox ear drops). Secondary overgrowth of fungi is a well-known and recognized complication of the use of broad-spectrum antibiotics like quinolones[10].

All our patients with no growth isolated on culture and sensitivity treated with a topical antibiotic/steroid (Ocupol D_x) combination and an oral antihistamine for two week had complete relief from symptoms of itching on follow up. This combination is a good option for treatment of pruritic ears in patients with no underlying bacterial or fungal pathology.

CONCLUSION

While our ears may be fairly small, they are full of sensitive neurological fibers. As a result, ears are subject to their fair share of itching. Asteatosis can be a cause of itching other than bacterial or fungal infections. Hence, it is prudent to consider asteatosis as one of the differential diagnosis for chronic and persistent itching. Our study showed that a combination of a topical antibiotic/steroid and oral antihistamine is effective in alleviating the symptoms of pruritic ears. Moreover our study concluded that topical ciprofloxacin drops are very effective against the common bacterial pathogens isolated from pruritic ears.

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