An Observational Cross-Sectional Study of the Proportion of Cutaneous Lesions Affecting External Ear, Presenting to Outpatient Clinic of a Tertiary Care Medical College in the Eastern Part of India

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ABSTRACT

BACKGROUND

Cutaneous lesions of external ear are quite common in clinical practice. Patients often present with various cutaneous lesions of the external ear to various disciplines. They are often underdiagnosed as many lesions, though commonly diagnosed by our dermatologist colleague are missed by other clinicians. These lesions can be classified in various ways, according to the aetiology, and according to the anatomic sites. In the present study, we tried to assess the prevalence of different skin lesions affecting external ear presenting to an ENT and skin outpatient department of a tertiary care medical college in Eastern part of India.

METHODS

This is a descriptive observational study, cross sectional in design. 240 patients attended the outpatient department with cutaneous lesions affecting external ear from January 2019 to February 2020. The patients presenting in both ENT and skin outpatient department were chosen randomly. Cases were diagnosed based on history and clinical examination and appropriate investigation as required. All cases were categorised into 5 types (infective, inflammatory, autoimmune, neoplasm & naevi, and reactive & reparative) according to the aetiology. In each category, prevalence of various skin lesions was recorded.

RESULTS

A total number of 240 cases were detected during the study period. Among them, infective 43.33 %, inflammatory 30.83 %, autoimmune 9.17 %, neoplasm & naevi 4.17 % and reactive & reparative were 12.82 %. Taenia was the most common lesions encountered (20.51 %) followed by keloid (12.5 %). Impetigo and seborrheic dermatitis shared same number of cases (9.4 %). Neoplastic lesions were the least common.

CONCLUSIONS

With some awareness and basic knowledge, many of the cutaneous lesions of external ear can be diagnosed and treated whenever patients report to a clinician, thus saving valuable time, effort and money of the patient.

KEYWORDS

Cutaneous Lesions, Skin Lesions, External Ear

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BACKGROUND

Anatomically, ear has been divided into 3 parts viz external ear, middle ear and internal ear or labyrinth. The external ear consists of the auricle or pinna, external auditory canal and the tympanic membrane. The whole pinna, except the lobule, and the outer part of external auditory canal are made up of a framework of a single piece of yellow elastic cartilage covered with skin. The skin is closely adherent to the perichondrium on its lateral surface while it is slightly loose on the medial surface. The external auditory canal or the external acoustic meatus is 24 mm in length and consists of outer cartilaginous part and inner bony part. The outer cartilaginous part is the continuation of the cartilage of pinna. The skin over the cartilaginous canal is thick and contains ceruminous and pilosebaceous glands which secrete wax. Hair is only confined to the outer canal and therefore furuncles are seen only in the outer one third of the canal. Skin lesions of external ear are very common. The lesions usually involve the pinna and adjoining areas. They are often classified according to the aetiology like inflammatory, infective, premalignant and malignant tumours.[1,2] Due to the characteristics of its anatomical location, the external ear is exposed and easily damaged due to trauma, weathering, and inflammation. Therefore, various dermatologic diseases can occur in the external ear. This region is especially vulnerable to ultraviolet (UV) light exposure, thus, premalignant and malignant dermatologic diseases are frequent in older adults. Though sometimes the diagnosis is straight forward, often diagnosis becomes difficult due to overlapping of clinical features, modification of the lesions due to self-medication, spontaneous secondary changes like eczematisation, secondary infection or use of cosmetics or ornaments.

In day-to-day clinical practice, patients often present with various cutaneous lesions of the external ear to different disciplines namely dermatology, otorhinolaryngology, general physician, plastic surgeons. These conditions are often underdiagnosed. As clinicians, we often refer many cases to our dermatologist colleague for confirmation of diagnosis. Even so we give treatment to these cases without referring for confirmation of the diagnosis. ENT clinicians or audiologists most often concentrate on the audiological problems rather than the cutaneous lesions either due to lack of knowledge or just because of ignorance. But as clinicians, it is our duty to guide the patients to proper professionals so that appropriate treatment can be given.[2]

In this study, we have tried to find out about the proportion of the lesions of external ear according to the aetiology presented to outpatient department of ENT and skin, so that proper management of these lesions can be instituted.

METHODS

This descriptive observational study in cross sectional design was undertaken from January 2019 to February 2020 in a tertiary care medical college in the Eastern part of India. Patients who attended to outpatient department of ENT and skin were randomly included in the study.

Inclusion Criteria

1. Patients with cutaneous lesion affecting external ear only.
2. Patients with cutaneous lesion affecting external ear along with lesions affecting other body parts.

In most of the cases, detailed history taking, thorough clinical examination of all body parts apart from external ears for distribution pattern of similar or relevant lesions, helped to clinch clinical diagnosis. Whenever necessary, patients were referred to dermatology department for confirmation of cases. According to the need, relevant investigations were undertaken. These included histopathological examination of skin biopsy specimens, slit skin smear examination followed by acid fast bacilli (AFB) staining, microscopical examination of potassium hydroxide (KOH), preparation of skin scrapping, rK39 dipstick test, complete blood count, blood for liver function test (LFT), blood for antinuclear antibody (ANA), Anti ds deoxyribonucleic acid (DNA), Anti Scl-70 antibody. Following the confirmation of the diagnosis, lesions were classified according to the aetiology. We have divided all the cases into 5 categories namely infective, inflammatory, autoimmune, neoplasm & naevi and reactive & reparative. Under each category, prevalence of different skin lesions was measured. Ethical approval was obtained from the institutional ethics committee of Malda Medical College & Hospital.

Statistical Analysis

The study subjects were selected by complete enumeration of the patients attending ENT and skin OPD with skin lesions of external ear, so there was no scope of sampling, hence no statistical test was used. The proportion/percentage was the only statistical measure used.

RESULTS

A total number of 8462 patients attended ENT and skin OPD during study period. Among them, 240 cases (ENT OPD 23 and skin OPD 217) with cutaneous lesions involving external ear were included in the study. There was male preponderance in the study population (56.67 % vs 43.33 %) (Table 1). Among the total cases, infective cases were 43.33 % (N = 104), inflammatory 30.83 % (N = 74), autoimmune 9.17 % (N = 22), neoplasm & naevi 4.17 % (N = 10) and reactive & reparative were 12.5 % (N = 30) (Table 2).

Sex	No of Cases
Male	136 (56.67 %)
Female	104 (43.33 %)

Table 1. Distribution of Cases According to Sex

Values are presented as numbers (%)

Figure 1.
Tinea Faciei

Figure 3.
Verruca Vulgaris

Figure 2.
Lepromatous Leprosy

Figure 4.
Post Kala-Azar Dermal Leishmaniasis

Figure 5.
Discoid Lupus Erythematosus

Lesions of the External Ear

Infective (104) [43.33 %]	Inflammatory (74) [30.83 %]	Autoimmune (22) [9.17 %]	Neoplasm and Naevi (10) [4.17 %]	Reactive and Reparative (30) [12.50 %]
Bacterial (36) Impetigo [22] Furuncle [5] Lepromatous leprosy [9] **Viral (14)** Verruca vulgaris [2] Herpes zoster [12] **Fungal (48)** Tinea [48] **Protozoal (6)** Post kala-azar dermal leishmaniasis [6]	Seborrheic dermatitis [22] Allergic contact dermatitis [15] Atopic dermatitis [5] Chronic actinic dermatitis [1] Airborne contact dermatitis [3] Nummular eczema [2] Keratolysis exfoliative [1] Polymorphic light eruption [2] Acne vulgaris [2] Lupus miliaris disseminata faciei [1] Angiolymphoid hyperplasia with eosinophilia [1] Infective eczema [19]	Discoid lupus erythematosus [4] Systemic lupus erythematosus [2] Vitiligo [3] Systemic sclerosis [2] Lichen planus [2] Psoriasis [7] Pemphigus vulgaris [2]	Basal cell carcinoma [2] Seborrheic keratosis [3] Haemangioma [3] Dermal melanocytic naevus [2]	Keloid [24] Lymphocytoma cutis [2] Post inflammatory hyperpigmentation [4]

Table 2. Distribution of Cases According to Aetiology (N= 240)

() Values are presented as numbers. [] Values are presented as percentages.

Infective cases were distributed into bacterial, viral, fungal and protozoal variety. Among bacterial cases, most were Impetigo (22 cases) followed by lepromatous leprosy (9) and furuncle (5). Most of the viral cases were due to Herpes zoster (12) apart from 2 cases of verruca vulgaris whereas all fungal and protozoal cases were due to taenia (48) and post kala-azar dermal leishmaniasis (6) respectively (Table 2).

Lesions due to inflammatory cases were mostly due to various forms of dermatitis viz seborrhoeic dermatitis (22), allergic contact dermatitis (15), atopic dermatitis (5), chronic actinic dermatitis (1) and airborne contact dermatitis (3). Remainder were nummular eczema (2), keratolysis exfoliativa (1), polymorphic light eruption (2), acne vulgaris (2), lupus miliaris disseminata faciei (1) and angiolymphoid hyperplasia with eosinophilia (1) (Table 2).

Among autoimmune disorders, we have found discoid lupus erythematosus (DLE) (4 cases), systemic lupus erythematosus (SLE) (2), vitiligo (3), systemic sclerosis (2), lichen planus (2), psoriasis (7) and pemphigus vulgaris (2) (Table 2). Among neoplasm and naevi, 2 cases of basal cell carcinoma, 3 seborrheic keratosis, 3 haemangioma and 2 dermal melanocytic naevus cases were found (Table 2).

24 cases of keloid along with 2 cases of lymphocytoma cutis and 4 cases of post inflammatory hyperpigmentation were found under reactive & reparative lesions (Table 2).

DISCUSSION

External ear consists of pinna and external auditory canal, Pinna is made up of a single elastic cartilage.[1] The skin of the lateral and medial surfaces of the pinna has hair along with sebaceous and sudoriferous glands. The skin is tightly bound down to the perichondrium on the lateral aspect and only loosely attached on the medial. The lateral one-third of the external auditory canal comprises a continuation of the cartilage of the pinna whereas medial two-third is osseous. The skin of the cartilaginous canal has a substantial subcutaneous layer, replete with hair follicles, sebaceous glands, and cerumen glands. The skin of the osseous canal, in contrast, is very thin and is devoid of adnexal structures. Due to its specific anatomical position, pinna and adjoining part of external ear is prone to damage due to trauma, inflammation or damage caused by change in weather condition.[2] This area is also prone to UV rays which may lead to various premalignant and malignant conditions especially in elderly.[1]

Christopher Garvey et al. reviewed eight common lesions affecting external ear. He divided all the cases into benign, premalignant, and malignant groups.[2] Among the benign lesions, there were seborrheic keratosis, seborrheic dermatitis, chondrodermatitis nodularis helicis chronicus and psoriasis. Actinic keratosis was the only premalignant lesion whereas basal cell carcinoma, squamous cell carcinoma and melanoma constituted the malignant lesions.

Michael Sand et al. described the lesions of external ear where surgery or laser therapy is considered as a possible treatment option or which are potentially subject to surgical evaluation.[1] He divided lesions mainly into epithelial and non-epithelial tumours along with some inflammatory and infectious lesions.

In the present study, lesions attributed to infection were most common (43.59 %) followed by inflammatory and others. All the cases with infective aetiology were further subdivided into bacterial, viral, fungal and protozoal cases. Tinea was the single most common lesion found in the study. Tinea, when involved face called tinea facialis (Figure 1), is a relatively rare dermatophyte infection that occurs on the non-bearded regions of the face. Preponderance of tinea in the present study (20.51 % of all cased) can be explained by ongoing epidemic of superficial fungal infection in the study region.[3,4] Most of the cases involved multiple body sites apart from external ear (87.5 %, N = 42). Impetigo was found in 22 cases. *Staphylococcus aureus*, alone or in association with group A beta haemolytic streptococcus, may cause impetigo contagiosum of the ear. Pinna is relatively a common site for infection in infants and young children.[5] Leprosy, the infective granulomatous disease, quite prevalent in India, often involves the ear, in which the earlobe is a valuable site for taking smears (Figure 2).[6] We have found 2 cases of verruca vulgaris. Verruca vulgaris or common warts are caused by human papillomavirus. Though such warts can develop anywhere on the skin, ear is relatively uncommon site (Figure 3).

All protozoal cases were due to post kala-azar dermal leishmaniasis (PKDL) (6 cases). PKDL is mainly seen in

Sudan and India where it follows treated visceral leishmaniasis in 50 % and 5-10 % of cases, respectively. Thus, it is largely restricted to areas where *Leishmania donovani* is the causative parasite. It is not surprising as the people under study came from districts endemic for visceral leishmaniasis (Figure 4).

External ear and retroauricular area are known to be common sites of seborrheic dermatitis. It is regarded by some dermatologists as the basis of most cases of otitis externa. In the present study, seborrheic dermatitis was the commonest inflammatory disease of external ear (29.73 %).

Otitis externa is an infection of the external auditory canal. It develops when normal defence mechanisms fail. High ambient humidity, direct exposure to water, local trauma, chronic dermatitis, the introduction of exogenous bacteria, and prolonged exposures to elevated temperatures contribute to the failure of local defense mechanisms. Diffuse external otitis develops when the normal flora that colonize the external auditory canal are replaced by a single organism of pathogenic potential. Saprophytes that normally reside in the external auditory canal includes Staphylococcus, Streptococcus, Micrococcus, some gram-negative bacilli, and some types of saprophytic fungi. The presence of these saprophytes helps suppress pathogenic bacteria by competing for locally available resources.

Otitis externa can be divided, for convenience, into two main groups[7]: a reactive group consisting of patients suffering from eczema, psoriasis or seborrheic dermatitis and neurodermatitis, and a predominantly infective group in which bacteria, virus or fungi are involved. Otitis externa usually presents with severe earache, local tenderness but often it presents as excoriation due to discharge. Bacterial otitis externa can be subdivided into localised acute otitis externa (Furuncle), diffuse otitis externa and malignant (necrotising) otitis externa. A furuncle is a staphylococcal infection of the hair follicle. As the hair are confined only to the cartilaginous part of the meatus, furuncle is seen only in this part of meatus. Usually single, the furuncles may be multiple. Diffuse otitis externa is a diffuse inflammation of meatal skin which may spread to involve the pinna and epidermal layer of tympanic membrane. Trauma to the meatal skin and invasion by pathogenic organisms are the two factors responsible for the condition. Malignant (necrotising) otitis externa is an inflammatory condition caused by Pseudomonas especially in elderly diabetic or immunocompromised patients. Fungal otitis externa is also called otomycosis. It is a fungal infection of the ear canal that often occurs due to *Aspergillus niger, A. fumigatus* or *Candida albicans*. It is seen in hot and humid climate of tropical and subtropical countries. Secondary fungal growth can also occur in patients using topical antibiotics for treatment of otitis externa or middle ear suppuration. Viral otitis externa is usually of two types, Otitis externa haemorrhagica and Herpes zoster oticus. Otitis externa haemorrhagica is characterised by formation of haemorrhagic bullae on the tympanic membrane and deep meatus. It is probably viral in origin and may be seen in influenza epidemics. harps zoster oticus is characterised by formation of vesicles on the tympanic membrane, meatal skin, concha and postauricular groove. The seventh and eighth cranial nerves may be involved.

Good number of cases (18) were due to infective eczema secondary to excoriation caused by the discharge due to chronic otitis media. Allergic contact dermatitis was also very common in our study (20.27 %) among inflammatory cases next to seborrheic dermatitis.

Among autoimmune disorders, we have found discoid lupus erythematosus (DLE), systemic lupus erythematosus (SLE), vitiligo, systemic sclerosis, lichen planus, psoriasis and pemphigus vulgaris. External ear, being a photo exposed area, is a common site of lupus erythematosus. Ultraviolet light is known to exacerbate this disease.[8] DLE can be subdivided into a localized form in which lesions are confined to the face above the chin, the scalp and the ears, and a disseminated form in which lesions also occur elsewhere on the body (Figure 5).[9] The two case of SLE in our series were of a 11 year old girl and a 28 year old woman with erythematous scaly discoid rashes over face, ears, neck and extensor aspects of forearms and hands, apart from systemic problems, who were tested positive for both ANA and anti-ds DNA. In two cases of systemic sclerosis, skin of the hand and face became tight, shiny and pigmented, and interestingly, changes spilled over from facial skin to involve the ears with atrophy and dyspigmentation. Pemphigus vulgaris is the commonest autoimmune blistering disease in Eastern countries[10] which, apart from mucous membranes, has a predilection for the scalp, face, axillae, groins and pressure points. We found 2 such cases which involved external ears (apart from usual sites) with flaccid blisters filled with clear fluid and erosions.

Although neoplasms of the external ear are relatively uncommon, their early diagnosis is a prerequisite for successful management. Although squamous cell carcinoma is the most common carcinoma of external ear, we have encountered only 2 cases of basal cell carcinoma.

Lymphocytoma cutis is known to affect external ears sometimes. Possible causative factors include *Borrelia burgdorferi* infection and gold earrings.[11]

We have found a good number of keloid cases involving pinna especially the lobule probably due to faulty technique of ear piercing. Keloids seem to occur more on the back surface than the front of the earlobe.[12] In our series also, 15 out of 24 cases had lesions on back surface of the ear lobule.

Most of the cases were diagnosed by clinical examination. But various laboratory tests were utilized to diagnose cases. Skin biopsy helped us confirm diagnosis of several cases of ours, namely, basal cell carcinoma, discoid lupus erythematosus, pemphigus vulgaris, lymphocytoma cutis, dermal melanocytic naevus, lupus miliaris disseminata faciei (LMDF), post kala-azar dermal leishmaniasis (PKDL), lichen planus, angiolymphoid hyperplasia with eosinophilia. All six cases of PKDL were tested positive for rK39 and one case showed presence of Leishman donovan (LD) bodies within histiocytes in skin biopsy with haematoxylin and eosin stain. All nine cases of lepromatous leprosy had acid fast bacilli in slit skin smear examination. Two case of systemic lupus erythematosus in our study were tested positive for both ANA and Anti ds DNA. Anti Scl-70 antibody was positive in one case of systemic sclerosis. In doubtful cases with

clinical suspicion of dermatophytosis (tinea), KOH study of skin scrapping identified long branching septate hyphae and thus helps to arrive in final diagnosis.

There are significant number of studies about various cutaneous lesion involving external ear but we could not find any study about the prevalence of the cases. Jong Kyu Kim et al. showed in their study distribution of skin lesions according to the anatomic location in geriatric population[13] but again it was not about the prevalence of the lesions. Though the actual prevalence rate cannot be truly judged by this study, but a rough estimate of prevalence of various common lesions can be obtained which in turn help ENT clinicians to increase awareness to manage such cases or at least refer the cases for proper management.

What's Already Known About This Topic?

- Cutaneous lesions of external ear are a common presentation to various disciplines namely dermatology, otorhinolaryngology, general physician, plastic surgeons.
- A good number of cases come to otorhinolaryngologist which are often underdiagnosed.

What Does This Article Add?

- An insight to the various skin lesions of external ear to clinicians especially otorhinolaryngologists.
- There are significant number of studies about various cutaneous lesion involving external ear but we could not find any study about the frequency of the cases.
- Rough estimate of prevalence rate of various skin lesions of external ear.

CONCLUSIONS

Though skin lesions of external ear are common in clinical practice, they are often underdiagnosed especially by non-dermatologic professionals. It is crucial to implement interdisciplinary approach for proper diagnosis of the cases so that appropriate treatment can be instituted.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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