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RESEARCH ARTICLE

Hazards of Ear Buds

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Abstract

Unfortunately more and more people are resorting to ear buds and hair pins to manually remove cerumen from their ears causing many complications. Many patients are also using ear buds to relieve itching in external auditory canal resulting in a vicious cycle of pruritis and repeated use of ear bud. More and more patients are coming with complications arising out of their use. Complications are varied and many fold. One hundred and forty one patients were included in this study who reported to our institution from July 2014 to July 2015. Youngest patient reported was of the age of 8 years and oldest patient reported was of the age of 78 years. There were 76 females and 62 males. Commonest complaint was intense pruritis in external auditory canal (EAM), followed by impaction of wax in deep EAM causing sudden diminution of hearing. Other complications were furuncle in EAM, otomycosis, otitis externa and rarely traumatic perforation of tympanic membrane. While allergen causing allergic pruritis in EAM by use of hair pins is identified as metal nickel, no work is being done to find out allergen in ear bud which is being more commonly being used these days.

INTRODUCTION

Wax is produced in hair bearing skin of EAM. Wax is a combination of desquamated skin and cerumen formed by glands in the base of hair follicles. Beneficial and necessary, the wax helps prevent dirt, dead skin and hair from getting lodged too far into EAM. The areas of skin that take part in cerumen production have all components of an active immune system and probably protect the ear canal by antibody mediated local response [2]. Most external ears are self cleansing with the desquamated skin migrating up to the hair follicles. Any excess wax is pushed out of the ear naturally by chewing motions of jaw [3].

Quantity of wax produced varies greatly from one individual to another and its components vary in different racial groups. Most Caucasians and Negroes have the so called 'wet' phenotype with moist honey coloured cerumen in contrast to the Mongoloid races which tend to have grey granules and brittle cerumen, the 'dry' phenotype[4]. A single nucleotide polymorphism in ABC C11 gene is responsible for ear wax with A genotype corresponding to dry wax and GA&GG to wet wax [5].

The famous branded buds are made of synthetic material. The common buds used contain cotton.

Raw cotton fibre is chemically processed to become surgical cotton used for medical use. Raw cotton fibres are separated and cleansed from cotton seeds by a mechanical process called 'ginning'. Cotton fibres are basically cellulose polymers. Raw un-purified cotton as such is hydrophobic in nature. A typical composition of cotton fibre is cellulose 94%; waxes 0.6%; pectins 0.9%; protein 1.3%; mineral matter 1.2%; organic compounds

0.8%; total sugars 0.3%.

The surgical cotton in bio-medical use is of three different forms:

(a) Non-absorbent bleached cotton

(b) Absorbent non bleached cotton.

(c) Absorbent bleached cotton.

Preparation of absorbent cotton goes through different stages, firstly a process called 'scouring' where it is treated with sodium hydroxide at a boil and pressure. And then washed with water and 1% acetic acid and finally with water and dried. The process developed at CIRCOT to make absorbent cotton from short staple cotton using commercial pectinate preparation. The process consists of treating Bengal Desi type of cotton with pectinate in optimum condition for 30 minutes in presence of wetting agent. Keeping it at 80-90 degrees Celsius for 30 minutes in water bath and finally washing with hydrogen peroxide at 85-90 degrees Celsius for one hour; washed thoroughly with cold water and air dried. The process is eco friendly and helps minimise pollution [6].

Ear buds are commonly used to dry ear after bath or to clear the wax. Repeated use of cotton buds give rise to allergy in EAM causing allergic pruritis. The exact allergen in cotton used as ear buds whether it is organic or non organic is not known. No work has been done in this direction as of now. However allergens are identified in paper, hair clips, paper, nail paints etc.[1] Local ear drops such as neomycin, polymicn, gentamycin etc. causing allergic reactions in EAM have been described [2]. It has been said that one in two thirds of patients attending a hospital clinic with otitis externa, there will be an allergic component, mainly topical medication [3].

Materials and methods

This is a retrospective study done in the Department of ENT, Princess Esra hospital affiliated to Deccan College of Medical sciences between July 2014 to July 2015. Thorough history was taken. Most patients gave history of using ears buds primarily to take out the wax from the ear and also some used ear buds after a bath to dry the ear. History of using ear bud is specially taken in the patients who had ear symptoms. A total of one hundred and forty one cases were studied who had symptoms pertaining to use of ear buds. Effected ears were examined. In discharging ears sterile ear swabs used for taking the discharge from ear and sent for microscopic exam under Gram's stain. Similarly fungal mass taken and sent for microscopic examination under KOH mount for confirmation.

Results

Majority of patients reported with intense itching in the ear affected due to constant use of ear bud to relieve itching and thus setting up vicious cycle, followed by sudden diminution of hearing trying to remove wax from the ear. Furunculosis in EAM is also common.

Usage of ear buds for itching causes rubbing of Skin of EAM causing injury to the delicate skin, thus causing furuncle in the hairy portion of EAM. Furuncle is nothing but an infected hair follicle. Otitis externa causing discomfort and discharge in the ear is also encountered. The discharge when sent for microscopic exam showed mixed flora. Other less common sequelae due to usage of ear bud are otomycosis, bleeding from EAM, traumatic perforation of tympanic membrane (TM) and one rare complication of traumatic perforation causing injury to incudostapedial (IS) joint resulting in intense vertigo and vomiting.. Complications arising out of using ear buds are given in Table.1.

Table. 1. Complications of use of ear buds

S no	Complaints	No of cases	Clinical findings	Diagnosis
1	Intense pruritis	56	Clear and shiny TM	Allergic otitis externa
2	Sudden diminished hearing	26	Impacted wax in deep EAC	Impacted wax
3	Intense otalgia	17	Oedema and tenderness	Furunculosis
4	Discomfort and Discharge	15	Discharge from EAC	Otitis externa
5	Itching and Discharge	12	Fungal mass	Otomycosis
6	Bleeding	8	Injury to EAM	Traumatic haemorrhage
7	Pain and Bleeding	6	Injury to TM	Traumatic perforation of TM
8	Bleeding and Vertigo	1	Injury to IS Joint	Traumatic perforation of TM

Fig. 1 Showing Ear Bud

Discussion

More and more people are resorting to use of ear buds which are freely available under different brands and non brands. The complications arising due to use of ear buds have not been described in the standard text books. Most commonly encountered condition being Allergic Otitis Externa (AOE). What goes into making of raw cotton into surgical cotton has been described in previous paragraphs, but the exact allergen in ear bud causing AOE is not known and no work has been done to this extent. But it is certain that ear buds used repeatedly do cause AOE. It is the author's observation that absolutely no wax is found in EAM of patients having AOE. Is it the absence of wax that causes pruritis is not known?. Absence of ear wax certainly takes away protective function. While it is known

that topical ear drops containing neomycin, polymyxin, framycetin, and gentamycin are known to cause allergy in EAM[2]. Allergen in hair clips and paper which are also used in the EAM has been identified as nickel. In addition some of the constituents of finger varnish, cosmetics and hair preparations can also cause AOE.[1]. The author recommended ten days of local application of clobetasol cream in EAM to relieve itching. In addition the author recommends fexofenadine 180 mg orally for ten days.

Acute hearing diminution due to impaction of wax in deep EAM is caused by attempts made to removal of wax. Impaction of wax requires careful dislodgement and removal of wax under good illumination. If the wax is hard the wax softeners are used before attempting to remove wax. In most cases wax after being dislodged with the help of Jobson Horne probe. Less frequently syringing is required.

Furuncle in the ear causes most excruciating pain, again is caused by use of infected ear bud. Furuncle is almost always due to staphylococcus necessitating use of co-amoxyclav and anti-inflammatory drugs to reduce pain. Local packing of EAM with Icthyol glycerine helps in reduction of oedema and pain. Otomycosis necessitates thorough aural toilet and topical cotrimazole. Otitis externa term applies to numerous inflammatory conditions that can affect the skin of EAM. In this study otitis externa is 4th commonest complication of dirty ear buds. Bleeding from ear usually stops by the time he reports to otologists. It is author's observation that perforation of TM caused by trauma of ear bud rarely heals spontaneously. They may require subsequent myringoplasty. Complicated traumatic perforation causing injury to IS joint requires institutional treatment.

Conclusion

More and more people are resorting to use of ear buds to dry the ears or to remove wax from ear. Ear buds are causing numerous
complications which are preventable. Patient education and use of social media should be explored to give the message of harmful effects of ear buds. Not much has been written in standard Text books of Otolaryngology and Head and Neck Surgery. Surfing through Google has given one reference of Cleaning ears with ear buds 'can cause deafness' [7]

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