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Role of Water as a quick Ear Wax softener before wax removal under microscope

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ABSTRACT

Ear wax is a common problem which brings the patient to ENT OPD. In many cases ear wax is very impacted and difficult to remove. Excessive ear wax can lead to symptoms such as hearing loss, tinnitus, itching, giddiness, pain, feeling of fullness in the ear and a reflex cough. Impacted ear wax can also lead to infection. Removal of wax under direct vision is the best method to be done under microscope. For some patients, additional strategy is necessary to soften the wax with a cerumenolytic and then removed. The role of water as a fast acting wax softener was investigated in this study.

The primary aim of this study was to investigate an alternate strategy for a quick dispersant of persistent ear wax by using water and to study its affects on extent of wax removal achieved, the patients comfort level, the complications and the adverse effects of water if any. Water is an effective ceruminolytic agent for wax removal. It is a fast acting agent where the removal can be done in the same sitting. It is also cheap and readily available. It increases the extent of wax removal. It reduces the time taken to remove wax. Installing of water before removal makes the procedure more comfortable and less painful for the patients.

Introduction:

Ear wax is a common problem which brings the patient to ENT OPD. In many cases ear wax is very impacted and difficult to remove. Excessive ear wax can lead to symptoms such as hearing loss, tinnitus, itching, giddiness, pain, feeling of fullness in the ear and a reflex cough [1]. Impacted ear wax can also lead to infection [2]. Removal of wax under direct vision is the best method to be done under microscope. For some patients, additional strategy is necessary to soften the wax with a ceruminolytic and then removed.

Ceruminolytic ear drops are available commercially to disintegrate wax but are said to be not easily available in rural areas and not cost effective. Syringing has been the most common method for removing wax, used by 95% of general practitioners [3]. But it is said to be associated with potentially serious complications like otitis externa, tympanic membrane perforation, damage to external auditory canal, pain, vertigo and incomplete removal [3].

Given the large number of people attending the ENT OPD with ear wax, it is surprising to find very few studies on its effective removal in literature. Wax is said to disintegrate in water [4]. In some of the studies, water proved to be the most effective and fast working agent for wax removal but not much clear details are available. So this prompted our study with the aim to investigate an alternate strategy for a quick dispersant of persistent ear wax by using water.

Materials and Methods:

This study was conducted in Department of ENT, MMMC&H from December 2013 to November 2014. 200 patients with complaints of ear wax (bilateral or unilateral) above the age of 18 years were enrolled in the study after obtaining written consent from the patients. The approval of local ethics committee was taken. Exclusion criteria were patients with tympanic membrane perforation, history of middle ear surgery, otitis externa and patients on ceruminolytic ear drops in the last three days. All the patients were examined and treated by the author performing this study.

The patients were randomized alternatively into study group and control group. 100 patients with ear wax (bilateral or unilateral) were taken in study group. In case of bilateral wax both ears were proceeded separately but in the same sitting. Drops of sterile water were dropped into the impacted ear and the auditory meatus blocked with a wet wad of cotton. After patient had waited for 15 minutes, attempts of wax removal were made under examining microscope using wax probe and microsuction.

Examining microscope provides required magnification and bright light. Remaining 100 patients with ear wax (bilateral or unilateral) in control group were directly taken for wax removal under examining microscope using wax probe and microsuction. In case of bilateral wax both ears were proceeded separately but in the same sitting.

The results of the two groups were assessed after microscopic procedure. The assessment points were –

1. The patient satisfaction was assessed according to LIKERT SCALE as 1 – completely comfortable , 2 - very comfortable , 3 – slightly comfortable , 4 – painful , 5 – very painful.

2. The extent of wax removal achieved.

3. Time taken for wax removal.

4. Extent of bleeding during wax removal.

5. Extent of complications like tympanic membrane perforation, trauma to external auditory canal during wax removal.

6. Any adverse effects of water in the study group.

Results:

200 patients who gave consent were enrolled in this study. All the patients were taken up for wax removal under microscope. Data was collected on all patients. All the patients were above the age of 18 years .The majority of patients were in the middle and older age groups (66% taken together) (Table 1). There was slight male predominance among the patients (Table 1).

Table 1 Age and Sex wise distribution

Age Group (in years)	Male	Female	Total
18 – 40	36	32	68
41 - 60	36	29	65
61 plus	38	29	67
Total	110	90	**200**

Among the 200 patients with ear wax, 125 patients (62.5%) had bilateral ear wax, remaining 75 patients had unilateral ear wax. Out of these, 37 patients had wax in right ear only and 38 had wax in left ear only. These results show that wax commonly affects both ears in a individual. There is not much difference in right or left ear in case only one ear is affected. (Fig. 1)

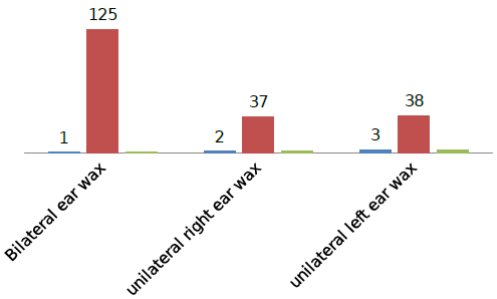

Fig 1 Epidemiology of ear wax

100 patients each with ear wax (bilateral or unilateral) were taken in study and control group. In case of bilateral wax both ears were proceeded separately but in the same sitting and in the same group. In the study group, drops of sterile water were dropped into the impacted ear and the auditory meatus blocked with a wet wad of cotton. After patient had waited for 15 minutes, attempts of wax removal were made under examining microscope. Remaining 100 patients with ear wax (bilateral or unilateral) in control group were directly taken for wax removal under examining microscope. Both groups results were compared.

Complete wax removal was achieved in 82 patients (82%) in study group using water as compared to 62 patients (62%) in control group. This shows that water has a role in increasing the extent of wax removal (Fig. 2)

Fig. 2 Comparison of complete wax removal achieved in both groups

Regarding the time taken for complete wax removal (In case of bilateral wax the average time taken in both ears was taken into account), for 30% patients in study group it took less than 3 minutes, for 32% patients it took 3 to 6 minutes, for 20% patients it took more than 6 minutes for complete wax removal. In remaining 18% patients in study group, complete removal could not be achieved. (Table 2) Whereas in control group for only 15% patients complete wax removal took less than 3 minutes. For 27% patients it took between 3 to 6 minutes and 20% patients more than 6 minutes. In a major 38% patients in control group, complete wax removal could not be achieved. (Table 2) These results show that water reduces the time taken for wax removal to a great extent.

Table 2 Time taken for complete wax removal

Time taken (In minutes)	Study group (Total patients – 100)	Control group (Total patients – 100)
Less than 3 min	30	15
3 to 6 min	32	27
More than 6 min	20	20
Incomplete removal	18	38

Regarding the comfort level of the patients while wax was removed in both groups when enquired about, nearly 55% in study group found the procedure as very or completely comfortable when water was used as compared to only 30% in control group where wax was directly removed without putting water. (Table 3) In study group only 25% patients experienced some kind of pain during procedure as compared to 48% in control group. (Table 3) These results show that using water drops before wax removal reduces pain and makes the procedure more comfortable for the patients.

Table 3 Comfort level of patients

Comfort level	Study group (Total patients – 100)	Control group (Total patients – 100)
Completely comfortable	25	10
Very comfortable	30	20
Slightly comfortable	20	22
Painful	10	18
Very painful	15	30

Regarding complications during the procedure, the complications were higher in control group than the study group. (Table 4) Bleeding was almost double in control group (42%) as compared to study group (20%). In 35% patients, there was trauma to external auditory canal (E.A.C) in control group as compared to only 15% in study group. Incidence of giddiness was also higher in control group. (Table 4) There was no incidence of tympanic membrane (T.M) perforation noted in both groups. These results show that water do has a role in reducing the complication rate during the procedure.

Table 4 Complications during wax removal

Complications	Study group (Total patients – 100)	Control group (Total patients – 100)
Bleeding (slight to severe)	20	42
Trauma to E.A.C	15	35
Giddiness	6	10
T.M perforation	NIL	NIL

No major adverse effect of installing water in the impacted ear was noted in the study group. The only precaution taken was that sterile water at body temperature was used to prevent infection and caloric effect. This shows that water is a safe ceruminolytic agent when used in a proper way.

Discussion:

The role of water as a fast acting wax softener was investigated in this study. The primary aim of this study was to investigate an alternate strategy for a quick dispersant of persistent ear wax by using water and to study its affects on extent of wax removal achieved, the patients comfort level, the complications and the adverse effects of water if any. Water was made sterile by boiling it and was then cooled to body temperature before being put in patient ears. Drops of water were dropped into the impacted ear and the auditory meatus blocked with a wet wad of cotton. After patient had waited for 15 minutes, attempts of wax removal were made in study group.

Ear wax is the most common problem and its removal is the most common procedure performed in out patient clinic [3]. It is a normal secretion, the purpose of which is generally thought to protect the ear from the particles entering the deeper part of the ear. Ear wax removes the particles to the outer ear. It is the failure of this process which leads to significant build up of ear wax. Accumulation of ear wax can lead to symptoms such as hearing loss, tinnitus, itching, giddiness, pain, feeling of fullness in the ear, reflex cough and can also lead to infection. 2 to 6% of population is said to be suffering from ear wax [5]. A study of 1507 patients screened for adult hearing loss, found suspected occluding wax in 2.1% of subjects [6]. There is increased prevalence among elderly. A study by Cullinan et al in 1990 also found ear wax to be more common in older age groups [7]. Our study also shows ear wax to be more common in middle and older age groups (66%). (Table 1) Studies have shown ear wax to be more common in men than women [8]. In our study also we found a male predominance in cases of ear wax presenting to ENT OPD. (Table 1) Most patients presented with bilateral ear wax in our study. (Fig 1)

The practice of softening ear wax goes back to the 18th century [9]. In one study, removing occlusive wax improved hearing by means of 5 db [3]. Ear syringing has been the most common method of removing wax even among general practitioners. But it is no longer an effective method of wax removal because of its complications. It is said to be associated with potentially serious complications like otitis externa, tympanic membrane perforation, pain, vertigo, otitis media and damage to external auditory canal [3]. According to a study ear syringing leads to higher rate of complications. It is also not very effective in achieving complete wax removal [3]. Attempting self cleaning of ear wax with cotton swabs or ear buds can lead to damage to the tympanic membrane especially in elderly due to declining tensile strength of tympanic membrane with advancing age[10] and is not very effective. It has now been replaced by direct removal under examining microscope which provides direct vision, better magnification and bright light. This of course should be practiced only after proper training by a otorhinolaryngologist.

For many patients it is necessary to soften the wax by a ceruminolytic before attempting removal. Olive oil has been traditionally used as a ceruminolytic agent [11]. But studies have found it to be ineffective [11]. Hydrogen peroxide has also been used but studies in literature show it doesn't dissolve ear wax [12].

Then there are many commercially available ceruminolytic ear drops available in market but they are not affordable for the vast majority of Indian population. Evidence regarding the pharmacological management of ear wax is inconsistent. They are not fast acting and patient need to be sent home and come back after few days for wax removal. These drops also cause complications like giddiness, pain, otitis externa [13]. Some patients also develop sensitivity and allergic reaction to these ear drops [2].

In some of the studies water proved to be one of the most effective and fast working wax removing agent [2] [4]. Ear wax is largely disintegrated in water within 15 minutes [4]. This treatment is quick and the procedure can be done in the same visit [14]. In our study we found more effective wax removal in the same sitting when water was used. (Fig 2) The time taken for removing wax was very less in the study group using water. (Table 2) According to a study installation of water into the ear canal aids in softening the ear wax and eases the wax removal [15]. In our study we found installation of water drops 15 minutes prior to wax removal as more comfortable and less painful to the patient. (Table 3) Some studies have found drops of sterile water to work as well as cerminolytic ear drops in wax removal with fewer complications [14]. In our study also we found very lower complication rate on using water and no major adverse affects of water were noted in our study. (Table 4)

Conclusion:

Water is an effective ceruminolytic agent for wax removal. It is a fast acting agent where the removal can be done in the same sitting. It is also cheap and readily available. It increases the extent of wax removal. It reduces the time taken to remove wax. Installing of water before removal makes the procedure more comfortable and less painful for the patients. It is also associated with fewer complications as compared to other ceruminolytic agents available. Water has no major side effects on the patients. Wax removal under direct vision under microscope is the best method of removing wax.

So it can be concluded that water is a quick and effective dispersant of ear wax and is a convenient treatment for patients. There is scope for further studies along this line of management also involving the paediatric age group patients.

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