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ORIGINAL ARTICLE

Comparison of Syringing of the Ear Wax with Plastic Disposable & Metallic Syringe

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ABSTRACT

Objective: Ear syringing is a very common procedure performed by both general physicians and Ear Nose and Throat specialists & consultants. To compare the effectiveness of plastic disposable and metallic syringes for removal of ear wax.

Patients and Methods: This experimental study was conducted on one hundred patients, over a period of one year from January to December 2016. These patients were divided into two groups by odd and even serial numbers. Group-A included 50 patients who were treated by syringing with a plastic disposable syringe to remove their ear wax while Group-B consisted of 50 patients who were treated by syringing with a traditional Higginson metallic syringe for the removal of their ear wax. The discomfort score, cost, efficacy, safety, and complications were recorded and compared in patients of both groups.

Results: Syringing with a plastic disposable syringe was more cost-effective, safer, lesser cumbersome and has less complications rate than syringing with a metallic syringe. However, the efficacy was similar in both types of procedures.

Conclusion: Syringing of the ear with a plastic disposable syringe is safer, more feasible, economical but equally effective as compared to syringing with a metallic syringe.

Keywords: Ear syringing, wax ear, metallic syringe, plastic disposable syringe

Author`s Contribution

Conception, synthesis, planning of research and manuscript writing Interpretation and discussion Data analysis, interpretation and manuscript writing and Active participation in data collection

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Introduction

Syringing of the ear is often needed for the removal of occluding wax from the ear. Wax is composed of secretions of sebaceous and ceruminous glands, desquamated epithelial debris, keratin, hair, and dirt. Wax has protective functions as it lubricates the external ear canal and traps any foreign material. Its smell discourages the entry of insects.[1] Normal wax is composed of water (80%), volatile substances (15%) and ash (5%), which includes Na, K, Ca, Mg, Cu and other trace elements.[2] It's color is brownish or yellowish due to oxidative causes.[3]

Different types of earwax are produced in Asian and non-Asian population. The gene for dry or wet type of earwax is located at chromosome 16 with predominance of wet variant. Kate Prigge from Monell says that their analysis of the smell of ear wax can be used to diagnose various genetic disorders like "maple syrup urine disease".

Swabbing someone's ears is a much simpler and cheaper process than doing a genetic test.[4]

Determination of type of the ear wax is done by a single nucleotide polymorphism in the ABCC 11 gene. Genotype AA is responsible for dry wax and GA and GG for wet wax. Human earwax is a Mendelian trait having two forms dry and wet. Dry wax lacks cerumen, is yellowish or grey and brittle. Wet wax is brownish and sticky. The incidence of impacted wax is 7-35% in children and adults. It is more common in men than in women and in mentally retarded persons.[5] Its incidence is increased by the use of cotton buds, earphones and hearing aids and in old age (about 50%) due to the production of hard wax.[6, 7]

Normally a small amount of earwax is produced which dries up and is expelled from the meatus by movements of the jaw. The most common cause of earwax blockage is the removal of the earwax at home by cotton buds, pins, scoops or other objects which actually pushes the wax deeper into the canal leading to complete blockage. Frequent use of earphones can also prevent natural expulsion of ear wax leading to blockage.[8] Other causes of impaction of earwax are excessive production of wax, narrow and tortuous ear canal, stiff excessive hair, exostosis, dusty occupation, self- cleaning by cotton buds and use of hearing aids. The secretion of ceruminous (sweat) glands can be affected by fever, adrenergic drugs and emotions resulting in an increase or altered secretion of wet wax. Impacted earwax is removed by one of three methods; syringing, suction or with instruments such as wax hook, scoop or Jobson Horn probe.[5, 9] Hard wax can be softened by instilling olive or almond oil into the ear; 3-5 drops, 3-5 times daily. Use of Sodium Bicarbonate drops are probably more effective because it not only softens but also dissolves the wax.[10] Waterjet of ear syringe should be directed to postero-superior wall of the ear canal to prevent eardrum perforation and further impaction of earwax.[11]

Syringing is contraindicated if there is a history of eardrum perforation, infection and previous ear surgery or grommet insertion. Alternate methods mostly used by ENT specialists and consultants is the use of irrigation machine, instruments or suction clearance (micro-suction) of the wax often under a microscope.[12] We planned this study to compare the effectiveness of plastic disposable and metallic syringes for removal of ear wax.

Patients and Methods

This experimental study was conducted at United Hospital, Rawlakot on 100 patients to find out the benefits of syringing of the ear with a disposable plastic syringe as compared to syringing of the ear with a metallic syringe. The duration of the study was 01 year from January to December 2016. All patients were followed-up for 4-8 weeks. Approval from the ethical committee was taken prior to the start of the study. Informed consent was taken from each patient after explaining the pros and cons. Those patients having a history of previous otitis media, earache, otorrhoea, grommet insertion, vertigo during syringing or eardrum perforation were excluded from the study. The selected patients were divided by odds and even serial numbers into two equal groups. Group-A included 50 patients who were treated by syringing with a plastic disposable syringe to remove their ear wax while Group-B consisted of 50 patients who were treated by syringing with a traditional Huginson metallic syringe for the removal of their ear wax. Main outcome variables to check the effectiveness of both methods were discomfort or pain score, complications, efficacy and cost. The discomfort or pain score was assessed in each patient on a scale from zero (no discomfort) to 100 (maximum discomfort or pain). The efficacy was judge by complete evaluation of ear wax. These variables were recorded on a Performa and compared in both groups. Statistical analyses of the obtained results were performed using SPSS version-23. For quantitative data, the mean and Standard deviation was calculated. Qualitative data was represented as number and percentage. The p-value was calculated by using independent t-test and chi-square test on WWW. GraphPad.com. Significance was given to a p-value of equal or less than 0.05.

Results

Total 100 patients were included in the study. Mean age of patients was 42.5 years ranging from 3 months to 98 years. Male to female ratio was 2:1.2. The mean and total discomfort scores were found significantly less in patients of Group-A, who received syringing of ear wax by plastic disposable syringe as compared to Group-B, who received syringing of earwax by metallic syringe (Table-1).

Table 1: Discomfort scores of syringing for earwax in patients (n=100)			
Features	**Group-A (n=50)**	**Group-B (n=50)**	**P-Value**
Total discomfort score	70	135	-----
Discomfort score (mean±SD)	14 ±6.04	27±27.37	<0.0001

The rate of complications such as vertigo and external ear canal injury were more common in Group-B as compared to Group-A patients (Table-2).

Table 2: Complications of syringing for earwax in patients (n=100)			
Features	**Group-A n(%)**	**Group-B n(%)**	**P-Value**
Fainting, dizziness and Vertigo	2 (4)	4 (8)	0.3492
Ear canal injury	Nil	2 (4)	<0.0001
Otitis externa	2 (4)	2 (4)	≥0.05
Tinnitus	1(2)	1 (2)	≥0.05

There were many other benefits of using plastic syringe for removal of earwax over metallic syringe as depicted in Table-3. The efficacy, judged by complete evacuation of the earwax was similar in patients of both groups.

Table 3: Comparison of features of syringes used for ear wax removal (n=100)		
Features	**Plastic syringe (Group-A)**	**Metallic syringe (Group-B)**
Cost	Less	More
Disposable	Yes	No
Pressure control	Easy	Difficult
Acceptability	More	Less
Rusting	Nil	Yes
Need of sterilization	No	Yes
Holding and stabilization of syringe	More Easy	Mild difficulty
Availability	Easily available	Not easily available
Need of greasing	No	Yes
Pressure of water jet	Low and easy to control	Medium/high and difficult to control

Discussion

The management of symptomatic impacted ear wax is a frequent demand in medical practice, but less research has been done on this topic.[13] A sound knowledge and understanding of the anatomy of normal parts of the ear is necessary to manage impacted earwax properly by the procedure of syringing.[14] Impacted wax can cause hearing loss of about 30-40 Decibels.[15] Ears blocked by wax are usually uncomfortable leading to irritation, reduced hearing and pain and these patients often seek rapid relief.

Ear wax removal is a time-consuming procedure in both GP and ENT specialist care centers. Some of the primary health care centers also advocate home treatment of ear wax by bulb syringing.[7,16] However effectiveness and safety of home treatment of ear wax is doubtful. Due to more risk of complications, it is not advocated for individuals to syringe their own ears. Moreover, without examination of their ears by a doctor, it can't be assured that the symptoms are due to impacted wax or some other cause.[17]

Syringing can cause some discomfort but it should not cause actual pain which if occurs then syringing should be stopped and ear must be inspected for ear canal injury or eardrum perforation. Rarely vertigo and tinnitus can occur and should be managed by cession of syringing and placing the patient flat on a couch for few minutes.[18]

Results of this study showed that total and mean discomfort scores were significantly less in Group-A (70 & 14) as compared to Group-B patients (135 & 27). Moreover, the prevalence of complications like dizziness, vertigo, ear canal trauma and eardrum perforation was less common in Group-A as compared to Group-B patients. The most probable reason for more risk of complications is the high pressure of water jet of the metallic syringe as compared to low pressure of water jet of a plastic syringe. The rate of otitis externa was almost similar in both groups. Statistical analysis of this data showed a p-value of 0.0001 which is considered to be statistically significant favoring Group-A patients. These results are almost similar to the findings by Thomas et al in 2012 who also found more complications in using a metallic syringe for ear wax removal. They also found traumatic facial nerve palsy in one patient. It is very important to be aware of this unusual complication which should be managed properly. They also suggested use of safer 50 or 100 ml plastic syringes.[29] However results of this study are contrary to findings by Vlantis and Soo

in 2004; who found that syringing of earwax by 50ml plastic syringe is equally effective and safer as compared to syringing of the ear with metallic syringe.[20] There is no need for routine ear care for ear wax. The more aggressively you remove earwax, the more aggressively body will produce it, and this can lead to a "vicious cycle". Therefore, it is better to stop cleaning the ears; the body will adapt and gradually produce less earwax. Normally, the movement of the jaw will propel the earwax to empty itself out of the ear canal.[21] It is important to detect and manage asymptomatic impacted earwax appropriately at general physician and consultant levels to prevent its potential long-term effects and complications.[22]

Conclusion

Syringing for removal of soft earwax is effective and safe when performed correctly after taking all precautions. The results of this study showed that use of the plastic disposable syringe is more beneficial and safer than the use of the metallic syringe for removal of soft earwax.

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