



RESEARCH ARTICLE

DOES SELF-EAR-CLEANING INCREASE THE RISK OF EAR DISEASE?

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ABSTRACT

Background Self-ear-cleaning is discouraged because it is thought to be associated with certain ear diseases but evidence to support this recommendation is sparse and not conclusive .

Objective To investigate the association of self-ear-cleaning with ear-related symptoms among young people in Osun state, Nigeria.

Methods A cross-sectional survey was conducted on a randomly selected sample of Nigerian youth in a youth camp in Osun State, Nigeria. Outcome variable was the presence or absence of ear-related symptoms. Independent variables were presence or absence of self-ear-cleaning, and ear cleaning habits. Univariate and bivariate analysis was subsequently done with SPSS 15.

Results There was no significant association between the self-ear-cleaning and presence of any ear-related symptom ($\chi^2 = 0.135, p=0.713$) or between self-ear-cleaning and a history of any ear-related symptom ($\chi^2 = 0.328, p=0.567$). There was however a significant negative association between self-ear-cleaning and the presence of earache ($\chi^2 = 6.352, p=0.020$) and a significant positive association between the presence of ear-related symptoms and the use of pointed objects for self-ear-cleaning ($\chi^2 = 12.221, p=0.006$).

Conclusion Self ear cleaning by itself does not appear to be associated with ear disease. This suggests that other factors associated with self ear cleaning may be responsible for the increased risk of ear disease that has been observed. This study identifies the use of sharp objects for self ear cleaning as one such factor. There is a need for more studies to identify more associated risk factors and there should be education away from self-ear-cleaning especially with sharp objects.

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INTRODUCTION

"Anybody wanting to put anything into his/her ear should feel free to put his/her elbow"! (Olaosun *et al*, 2013) . It is a basic rule of ear hygiene that self-ear-cleaning should not be practiced (WHO, 2006; Olaosun *et al*, 2013,). Because of a natural self-cleansing mechanism in the external ear, self-ear-cleaning is not necessary (Jung and Jinn, 2003). In addition, it is thought to be potentially dangerous, predisposing to some common ear problems. (Reiss, 1999). *Otitis externa*, the infection of the externa ear, Cerumen (earwax) Impaction with associated morbidity like hearing loss, and injuries to the ear are problems that have been commonly associated with self ear cleaning. The burden of these diseases, individually and collectively, is high. Acute otitis externa is thought to be one of the most common diseases encountered by clinicians (Neher *et al*, 2008; Rosenfeld *et al*, 2006), cerumen impaction is the most common ear, nose and throat (ENT) procedure performed in primary care (Guest *et al*, 2004), otologic injuries represent a significant part of the workload of the Otolaryngologist especially in sub-Saharan Africa (Afolabi *et al*, 2009; Gilyoma, 2013) and deafness is the most prevalent cause of disability worldwide (WHO, 2006a, 2006b, 2008, 2010). Consequently, expert advice discourages self-ear-cleaning (Roland *et al*, 2008)

Self-ear-cleaning is however a very common and widely practiced habit (Afolabi *et al*, 2009; Hobson & Lavy, 2005; Lee *et al* 2005; Macknin, 1994; Olaosun, 2014). And even though experts recommend against self-ear-cleaning, evidence against it is sparse (Roland *et al*, 2008) and inconclusive. It is true that some patients who practice self-ear-cleaning do present with the implicated ear diseases. But in practice, many patients are also encountered, who practice the habit but have never had these diseases. Conversely, there are many patients who do not practice self-ear-cleaning and yet present with recurrent attacks of these ear diseases. If the habit increases the risk of ear disease, there should be a significant association between the practice of the habit and the occurrence of ear disease and ear-related symptoms. Unfortunately, very few studies have rigorously addressed the issue and an association is yet to be conclusively demonstrated.

This study was therefore aimed at investigating the presence of an association between self-ear-cleaning and occurrence of ear-related symptoms, and to study if an association existed between the materials used for self-ear-cleaning and occurrence of ear-related symptoms among National Youth Service Corp members in Osun state, Nigeria. Patients with ear disease will usually present with one or more of the following

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ear-related symptoms: a feeling of fullness in the ear, pain in the ear, difficulty hearing, ringing in the ear (tinnitus), a feeling of itchiness in the ear, discharge from the ear and vertigo (feeling of imbalance such that individual feels like he is spinning or that the environment is spinning) (Roland *et al*, 2008) and in this study, ear-related symptoms are used as a proxy for ear disease.. The data here presented are from a study that investigated self ear cleaning among educated youths in Nigeria. The prevalence and predictors of self-ear-cleaning and its correlates among this population of 2317 youths from all over Nigeria was reported by Olaosun (2014).

METHODS

The study was an institutionally approved cross-sectional study. The target population was the population of National Youth Service Corps (NYSC) members in Osun state, Nigeria. The study population was from the self ear cleaning and correlates study and selected as described by Olaosun (2014). A minimum sample size of 385 was determined but a projection to study 1280 was made in order to facilitate subgroup analysis and also taking into consideration a non-response rate of 10%. The sample was selected by stratified random sampling. One-tenth of the total sample size was selected from each of the ten 'platoons' into which the corps members were systematically allocated, based on the number serially assigned them at registration.

Data collection was with a pre-tested, revised and validated semi-structured questionnaire. The major outcome variables were presence or absence of present history and past history of 'any ear-related symptom', a feeling of fullness in the ear, pain in the ear, difficulty hearing, ringing in the ear (tinnitus), a feeling of itchiness in the ear, discharge from the ear and vertigo (feeling of imbalance such that individual feels like he is spinning or that the environment is spinning).

Predictor variables included self-ear-cleaning (yes or no), depth, duration and frequency of self-ear-cleaning, the material(s) used for self-ear-cleaning and history of injury to the ears while cleaning them. Data entry, cleaning and analysis was with the Statistical Package for the Social Sciences (SPSS) version 15. Univariate analysis (proportions, means and standard deviations, medians and ranges) and bivariate analysis with crosstabs and chi-square tests (at 5% level of significance) were performed.

Ethical approval for the study was obtained from the Ethics Review Committee of the Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Nigeria. Written informed consent was obtained, confidentiality ensured and respondents with symptoms given appointments for follow up at the Ear, Nose and Throat clinic of the Ladoke Akintola University of Technology Teaching Hospital, Osogbo.

RESULTS

Among the 1012 subjects who returned their questionnaires, there were about as many females as males (M: F=1.05:1). Mean age was 25.3 (SD, 2.34). Detailed Socio-demographic characteristics were as published by Olaosun (2014).. The overall prevalence of self-ear-cleaning was 93.4%.

Table 1 shows the results of cross tabulation of self-ear-cleaning with the presence or absence of symptoms of ear disease. When all the symptoms were taken together, there

were ear-related symptoms in 35.9% of those who did not practice self-ear-cleaning compared with 33.7% in those who did. There was no statistically significant relationship between ear-related symptoms and self-ear cleaning ($\chi^2=0.135$, $p=0.713$). There was however a significant relationship between self-ear-cleaning and present history of earache. The proportion of respondents with a history of earache among those who did not practice self-ear-cleaning (12.5%) was significantly higher ($\chi^2=6.352$, $p=0.020$) than among respondents who practiced the habit (5.1%). No significant relationship was found between self-ear-cleaning and any of the other symptoms.

Tables 2 shows the relationship between self ear cleaning and past history of ear-related symptoms. The relationship between self-ear cleaning and a past history of ear-related symptoms was not found to be significant either when all of the symptoms were considered together or when each of the symptoms was cross-tabulated with self-ear-cleaning. There was also no significant relationship between self-ear-cleaning and visits to doctors for ear problems in the past as can be seen from table 3.

Table 4 shows the relationship between self-ear-cleaning habits and present history of ear-related symptoms. There was no significant association between self-ear-cleaning and the depth to which the object used to clean is inserted. There was also no significant association of the habit with frequency of cleaning and the duration of practice.

However, cross-tabulation of ear-related symptoms with categories determined by the nature of the object used (pointed or not pointed) for self-ear-cleaning (including a category for those who did not practice self-ear-cleaning) revealed that those who cleaned with pointed materials had the highest prevalence of symptoms (57.1%). Those who cleaned with non pointed materials had the lowest prevalence of 30%, and this was even lower than the prevalence for those who did not clean at all (36.4%). This association was statistically significant ($\chi^2=12.221$, $p=0.006$).

DISCUSSION

Self-ear-cleaning was not found to be significantly associated with present history of ear-related symptoms. It was also not found to be significantly associated with past history of ear-related symptoms. There was however a significant negative association between self-ear-cleaning and the presence of earache and a significant positive association between the presence of ear-related symptoms and the use of pointed objects for self-ear-cleaning.

Evidence linking self-ear-cleaning with ear disease has not been consistent. Macknin *et al*, (1999) found that cerumen occlusion of at least 75% was associated with cotton tipped swab use on the left side ($P=0.02$), but not on the right side ($P=0.27$). Although the authors concluded that cotton-tipped swab use may be associated with cerumen accumulation, the inability to consistently demonstrate association on both sides betrays the need for more rigorous studies. Also in favor of a link between self-ear-cleaning and ear disease, Nussinovitch *et al*, (2004) in a case control study of eighty-seven children with otitis externa found 70.1% in the study group had their ears cleaned with a cotton-tip applicator (Q-tip) during the 10 days preceding the diagnosis of otitis externa. In the control group,

only 31 (34%) used applicators routinely during the 10 days prior to diagnosis (P<0.001).

There have also been studies that do not support a link between self-ear-cleaning and ear disease. In a study of 325 patients attending an ENT referral clinic, Hobson and Lavy found that the frequency of self-ear-cleaning was not significantly higher in those with ear complaints than in those with nasal complaints (Hobson and Lavy, 2005).

Similarly, Sim (1988) determined that the incidence of visually occlusive wax plugs in the external auditory canals among 310 patients was not significantly different between users and non users of cotton buds, either in children or in adults.

This present study is an addition to the list of studies that suggest that there may not be an association between self-ear-cleaning and ear disease. There is actually a curious suggestion from our study that earache may be less in those who practice self-ear-cleaning (See table 1). One possible explanation is that self-ear-cleaning is associated with a pleasurable sensation and this may be a confounding factor. Another possibility is that the act of self ear cleaning itself when teased off from possible associated factors (as we will discuss below) may not be harmful, and may actually be beneficial. However, the number of respondents who did not practice self ear cleaning in our study was too small to justify any conclusion and larger studies are needed to further explore any relationship.

In this study, unlike others, self ear-cleaning was classified in several ways by practices / habits that differentiated the practice of self-ear-cleaning among respondents, in a bid to identify factors that may make self-ear-cleaning harmful or otherwise. Thus, the depth of insertion, the duration (that is, the period over which habit had been practiced), frequency of insertion, injury while cleaning and the nature of the object inserted were considered. Exploration of these variations, so far unexplored in available literature yielded interesting results.

Depth of insertion, duration of practice, and the frequency of self-ear-cleaning did not seem to affect the risk. It is to be noted however, that despite the non significance of the association of ear-related symptoms with the frequency of self-ear cleaning, there seems to be a trend (a higher proportion of frequent cleaners have ear-related symptoms compared to sporadic cleaners). Further investigation of this possible association is suggested for future studies.

Injuries to the ear during self-ear-cleaning have been reported in literature. Lee *et al* (2005) reported a complication rate of 2% in clinic patients. Injuries to the ear will usually manifest with ear-related symptoms, otherwise they pass unnoticed. In our study, a statistically significant association was found between the presence of a history of ear-related symptoms and the nature of the objects used for self ear cleaning.

This suggested that the presence or absence of injury during self-ear-cleaning may be an important modifying variable in self-ear-cleaning. Self-ear-cleaning in itself may not be the direct cause of ear-related symptoms or ear disease, and careful self-ear-cleaning with a non-pointed object and not associated with injury may not increase the risk of ear diseases. These are interesting hypotheses that need to be tested in future studies.

Table 1 Association of self-ear-cleaning with present history of ear-related symptoms.

Self ear cleaning	Ear-related symptoms		Total	X ²	P value
	Any Symptom				
	Yes (%)	No (%)			
No	23 (35.9)	41 (64.1)	64 (100)	0.135	0.713
Yes	314 (33.7)	618 (66.3)	932 (100)		
	Earache				
	Yes (%)	No (%)			
No	8 (12.5)	56 (87.5)	64 (100)	6.352	0.020*
Yes	47 (5.1)	883 (94.9)	930 (100)		
	Persistent Itching				
	Yes (%)	No (%)			
No	8 (12.5)	56 (87.5)	64 (100)	0.019	0.890
Yes	122 (13.1)	809 (86.9)	931 (100)		
	Ear discharge				
	Yes (%)	No (%)			
No	2 (3.1)	62 (96.9)	64 (100)	0.202	0.655*
Yes	21 (2.3)	911 (97.7)	932 (100)		
	Feeling of fullness in ear				
	Yes (%)	No (%)			
No	1 (1.6)	63 (98.4)	64 (100)	1.850	0.247*
Yes	51 (5.5)	881 (94.5)	932 (100)		
	Difficulty in hearing				
	Yes (%)	No (%)			
No	4 (6.3)	60 (93.8)	64 (100)	2.455	0.121*
Yes	26 (2.8)	906 (97.2)	932 (100)		
	Tinnitus				
	Yes (%)	No (%)			
No	0 (0)	64 (100)	64 (100)	2.124	0.253*
Yes	30 (3.2)	902 (96.8)	932 (100)		
	Vertigo				
	Yes (%)	No (%)			
No	5 (7.8)	59 (92.2)	64 (100)	4.322	0.055*
Yes	28 (3.0)	904 (97.0)	932 (100)		

*Fisher's exact test

Table 2 Association of self-ear-cleaning with past history of ear-related symptoms

Self ear cleaning	Ear-related symptoms		Total	X ²	P value
	Any Symptom				
	Yes (%)	No (%)			
No	12 (18.8)	52 (81.3)	64 (100)	0.328	0.567*
Yes	149 (16.0)	781 (84.0)	930 (100)		
	Earache				
	Yes (%)	No (%)			
No	7 (10.9)	57 (89.1)	64 (100)	3.085	0.095*
Yes	52 (5.6)	880 (94.4)	932 (100)		
	Persistent Itching				
	Yes (%)	No (%)			
No	3 (4.7)	61 (95.3)	64 (100)	0.057	1.000*
Yes	38 (4.1)	894 (95.9)	932 (100)		
	Ear discharge				
	Yes (%)	No (%)			
No	1 (1.6)	63 (98.4)	64 (100)	0.295	0.723*
Yes	25 (2.7)	907 (97.3)	932 (100)		
	Feeling of fullness in ear				
	Yes (%)	No (%)			
No	2 (3.1)	62 (96.9)	64 (100)	0.106	1.000*
Yes	23 (2.5)	909 (97.5)	932 (100)		
	Difficulty in hearing				
	Yes (%)	No (%)			
No	2 (3.1)	62 (96.9)	64 (100)	0.342	0.640*
Yes	19 (2.0)	913 (98.0)	932 (100)		
	Tinnitus				
	Yes (%)	No (%)			
No	0 (0)	64 (100)	64 (100)	0.834	1.000*
Yes	12 (1.3)	920 (98.7)	932 (100)		
	Vertigo				
	Yes (%)	No (%)			
No	0 (0)	64 (100)	64 (100)	1.545	0.391*
Yes	22 (2.4)	910 (97.6)	932 (100)		

*Fisher's exact test

Overall, this study strengthens the evidence that self-ear-cleaning is potentially injurious. Even non pointed objects can become injurious if applied with force (either accidentally or deliberately). Since self-ear-cleaning is almost universal (Olaosun, 2014) efforts to educate the public away from the habit need to be increased. In addition, there is a need for more studies to rigorously explore the factors that are associated with self ear cleaning and which may modify the risks of practicing the habit, in order to shed more light on the true relationship between self-ear-cleaning and ear disease.

One limitation of this study is the use of ear-related symptoms as proxy for ear disease. While some ear-related symptoms such as ear discharge are highly predictive of ear disease, others (such as earache which can be due to several other diseases of the head and neck) are not necessarily so. It is recommended that future studies utilize patients with ear disease confirmed by clinical examination and possibly, ancillary investigations.

Another limitation is the cross-sectional study design which examines both the exposure and the disease at the same time and cannot establish a correct temporal sequence between the exposure and the outcome, and also provides a lower level of evidence for causation than ex-post-facto (case control and cohort) and experimental studies.

It is also recommended that more case control, cohort and experimental study designs be utilized in future studies to further investigate self-ear-cleaning and ear disease.

Table 3 Association of self-ear-cleaning with visits to doctor for ear-related symptoms

Self ear cleaning	Visits to doctor		Total	X ²	P value
	Within past month				
	Yes (%)	No (%)			
No	3 (4.9)	58 (95.1)	61 (100)	0.170	0.728*
Yes	35 (3.9)	872 (96.1)	907 (100)		
	Past visit to ear specialist				
	Yes (%)	No (%)			
No	1 (1.6)	62 (98.4)	63 (100)	3.200	0.079*
Yes	69 (7.6)	836 (92.4)	905 (100)		

*Fisher's exact test

Table 4 Association of self-ear-cleaning habits with present history of ear-related symptoms

Self ear cleaning habit	Ear-related symptoms		Total	X ²	P value
	Yes(%)	No(%)			
Depth			754 (100)	2.353	0.125
Inside Canal	238(31.6)	516 (68.4)	105 (100)		
Not inside Canal	41 (39.0)	64 (61.0)			
Duration			21 (100)	5.335	0.255
< a year	9 (42.9)	12 (57.1)	21 (100)		
1-5 years	24 (34.3)	46 (65.7)	70 (100)		
6-10 years	59 (37.8)	97 (62.2)	156 (100)		
11-15 years	21 (24.4)	65 (75.6)	86 (100)		
>15 years	173 (33.3)	346 (66.7)	519 (100)		
Frequency			317 (100)	3.165	0.075
Frequent ^o	114 (36.0)	203 (64.0)	513 (100)		
Sporadic ^x	154 (30.0)	359 (70.0)			
Material			14 (100)	12.221	0.006*
Pointed	8 (57.1)	6 (42.9)	14 (100)		
Use Non pointed	207 (30)	484 (70)	691 (100)		
Both	63 (42.0)	87 (58.0)	150 (100)		
No cleaning	24 (36.4)	42 (63.6)	66 (100)		

o - At least once daily

x- Less than once daily

* Fisher's exact test

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