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A study on etiological profile of referred otalgia

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ABSTRACT:
Background: *Otalgia or earache is one of most commonly encountered complaint in ENT OPD. It may be due to any local ear pathology or may be due to pathology in some distant site surrounding head and neck region. The complex sensory innervation of ear poses a diagnostic challenge.*
Methods: *A cross sectional study was carried out in the ENT OPD of our institution. Patients complaining of otalgia with absence of any local ear pathology were included in the study. 73 patients were evaluated according to the site of distant pathology, age, sex and laterality.*
Results: *Referred otalgia was encountered in 27.04% cases. The most common cause was found to be dental caries(35.61%). The most commonly affected age group was 16-30yrs ie. young adults. 54.79% and 45.21% were male and female patients respectively. A significant amount (5.48%) of patients were diagnosed as malignancies.*
Conclusion: *While evaluating a case of referred otalgia one should pay attention to exclude any dental cause and for older patients the possibility of occult aerodigestive tract malignancy should be kept in mind.*
Keywords: *Referred otalgia, Dental caries*
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I. Introduction:

Otalgia or earache is a very common presenting problem in an ENT clinic. Otalgia can be primary (originating from ear pathology itself) or secondary (originating from pathologies outside the ear, but sharing common nerve supply).[1,2] Secondary otalgia is also known as referred otalgia.

The complexity of the sensory innervation of ear poses much diagnostic dilemma while evaluating for cause of otalgia. In referred pain, the pain is usually felt at a somatic dermatome even though the stimuli are from visceral tissue.[3] The ear receives its sensory innervation from six sources, and several other head and neck structures share a common nerve supply.[4] Thus, pathologies occurring in the neural network of cranial nerve V,VII,IX and X and cervical spinal nerves C2 and C3 can be considered as possible etiologies of referred otalgia.[5]

So there are various pathologies which can cause referred otalgia e.g. dental caries, temperomandibular joint dysfunction, tonsillitis, pharyngitis, sinusitis, stylalgia, malignancy of oropharynx and larynx. Among the nerves responsible for referred otalgia, the most common nerve involved is CN V.[6]

If the cause of otalgia can't be determined in the primary visit then the patient should be given symptomatic treatment and to be followed up subsequently. Relevant investigations should be sought out to determine the site of pathology.

As there is no single, simple algorithm for determining the cause of otalgia and due to complex innervation of ear frequently the clinicians get puzzled and the cause remains obscure. The late diagnosis in some cases e.g. malignancy, can lead to life threatening conditions. The purpose of the study is to identify various non-otogenic causes of otalgia and how to approach in this cases so that any undesired outcome can be avoided.

II. Materials And Methods:

This cross sectional study was done on the patients visiting the ENT OPD of Burdwan Medical College and Hospital, with earache from July 2016 to July 2017. Patients complaining of earache with no obvious otogenic cause were included in the study.

A thorough ear, nose, throat examination was carried out in every patient. Apart from routine ent examinations the temperomandibular joint and dentition were also done. In relevant cases the opinion of dental, skin consultants was also taken. Radiological investigations, fibre optic laryngoscopy, diagnostic nasal endoscopy, biopsy were also done to reach the diagnosis.

The distribution of various etiologies in the affected patients were tabulated and categorised. The data regarding the age, sex, affected side were also taken and tabulated accordingly.

III. Results:

There were 270 patients who presented with earache in our ENT OPD. Out of 270 patients 197 (72.96%) patients had definite otogenic causes of otalgia and they were excluded from the study. The remaining 73 (27.04%) patients were evaluated and were included in the present study, in whom no definite cause of earache was found in the ear.

The most common cause of referred otalgia was found to be the dental caries (26cases; 35.61%). The other causes following it in descending order are temperomandibular joint (TM joint) dysfunction (14cases; 19.18%), tonsillitis (11cases; 15.07%), pharyngitis (9cases; 12.33%), sinusitis (6cases; 8.22%), malignancies (4cases; 5.48%) and stylalgia (3cases; 4.11%) [Table 1]. There were 4 (5.48%) cases of malignancies, in which the diagnosis was confirmed by means of biopsy. Among the 4 cases 2 cases were from larynx, 1 was from hypopharynx and 1 was from the base of tongue. In all the malignancy cases the histopathology was found to be Squamous cell carcinoma.

Table 1: Distribution of referred otalgia in terms of etiology

Sl no	Etiological factor	No. of cases	Percentage(%)
1	Dental caries	26	35.61
2	TM joint dysfunction	14	19.18
3	Tonsillitis	11	15.07
4	Pharyngitis	9	12.33
5	Sinusitis	6	8.22
6	Malignancies	4	5.48
7	Stylalgia	3	4.11
Total		73	100

In our study the incidence of referred otalgia was most commonly encountered in the age group of 16-30 yrs (25cases; 34.25%). The frequencies of secondary otalgia in other age groups in descending order are 0-15 yrs (20cases; 27.4%), 31-50 (19cases; 26.02%) and 51-70 yrs (9cases; 12.33%) [Table 2].

Table 2: Distribution of referred otalgia in terms of age

Sl no	Etiology	Age group			
		0-15	16-30	31-50	51-70
1	Dental caries	6	14	4	2
2	TM joint dysfunction	0	2	8	4
3	Tonsillitis	9	2	0	0
4	Pharyngitis	3	4	2	0
5	Sinusitis	2	2	2	0
6	Malignancies	0	0	1	3
7	Stylalgia	0	1	2	0
Total		20	25	19	9

In our study we got 31(42.47%) cases lateralised to right ear and 33(45.2%) cases lateralised to left side. 9(12.33%) cases were found to be bilateral.

Table 3: Distribution of referred otalgia in terms of laterality

Sl no	Etiology	Laterality		
		Right	Left	Bilateral
1	Dental caries	12	11	3
2	TM joint dysfunction	5	8	1
3	Tonsillitis	5	4	2
4	Pharyngitis	4	4	1
5	Sinusitis	2	4	0
6	Malignancies	1	1	2
7	Stylalgia	2	1	0
Total		31	33	9

Out of 73 patients 40(54.79%) patients were male and the remaining 33(45.21%) patients were female. So the male and female ratio that we got in our study was 1.2:1.

Table 4: Distribution of referred otalgia in terms of sex

Sl no	Etiology	Sex	
		Male	Female
1	Dental caries	16	10
2	TM joint dysfunction	5	9
3	Tonsillitis	6	5
4	Pharyngitis	5	4
5	Sinusitis	4	2
6	Malignancies	3	1
7	Stylalgia	1	2
Total		40	33

IV. Discussion:

The ear is unique that there is no structure in the body of comparable size that is supplied by sensory nerves of so many different neural segments(Dalessio,1972).[7] As a result most diseases arising between clavicle and skull base have been reported as associated with otalgia.[8] Otalgia may be primary ie. associated with local ear pathology or may be secondary when the pathology lies elsewhere. Some of the causes of secondary otalgia may be serious one , so every case of referred otalgia should be evaluated thoroughly by having a detailed history and examination. The radiological investigation, special investigations like fibre optic laryngoscopy, indirect laryngoscopy should be done if required. The opinion of other faculties may be needed at times to reach a diagnosis.

In our study, out of 270 patients with otalgia 73(27.04%) patients were found to have referred otalgia. This goes in accordance with the study done by Rajasekaran et al.[6] and Gandhi et al.[9] who found the incidence of referred otalgia to be 28.4% and 31% respectively. A higher incidence(46%) has been reported by Kiakojoori et al.[10] while a much lower incidence of 12.2% has been reported by Taziki et al.[11]

In our study, most affected age group is 16-30 yrs age accounting for 25(34.25%) cases out of 73. This observation goes with the finding of Taziki et al.[11] who also found the 37% incidence of referred otalgia in the 21-35 yrs of age group. The next most commonly affected age group according to our study is 0-15yrs, in which we got 20(27.4%) cases. This does not go with the study done by Rajasekaran et al.[6] who doesnt find any incidence of referred otalgia below 15 yrs. Neilan et al.[12] also reported the children most commonly suffer from primary otalgia while the adults are the main sufferer of referred otalgia.

We have found the incidences in male and female as 54.79% and 45.21% respectively. There is 1.2 times higher incidence was observed in males. Kim et al.[13] and Rajasekaran et al.[6] observed a similar frequency of occurrence in both of the sexes. On the other hand Taziki et al.[11] and Kiakojoori et al.[10] observed higher incidence among females.

According to our study the most common cause of referred otalgia is dental caries(35.61%), followed by TM joint dysfunction(19.18%), tonsillitis(15.07%), pharyngitis(12.33%), sinusitis(8.22%), malignancies(5.48%) and stylalgia(4.11%) in descending order. This finding is consistent with Taziki et al.[11] and Kim et al.[13] who also reported the tooth ache to be the most frequent etiology. Rajasekaran et al.[6] and Behnoud et al.[14] reported TM joint dysfunction to be the most common cause. In our study the TM joint dysfunction 2nd most common cause of referred otalgia.

We have diagnosed 4(5.48%) cases of malignancies causing referred otalgia. Among these 2 were carcinoma larynx and the other 2 was carcinoma base of tongue and carcinoma hypopharynx respectively. It is noteworthy that carcinoma of the tongue base patient only had otalgia as his chief complaint. This is consistent with the study of Kiakojoori et al.[10] who also mentioned 6% referred otalgia cases due to malignancies. Reiter et al.[15] reported a case of nasopharyngeal ca presenting as otalgia. Mulwafu et al.[16] and Gandhi et al.[9] reported an incidence of 33% and 12.9% respectively,of referred otalgia due to malignacies.

V. Conclusion:

In this study we have observed a male predominance unlike other studies. The most common cause is being the dental caries. So in a patient of otalgia in absence of primary pathology one should exercise a thorough examination of oral cavity, oropharynx, nose and throat. In the young adults the referred otalgia is mainly due to infective causes but whenever evaluating an older patient one should not miss any occult malignancy of aerodigestive tract which often has a tendency to present as an isolated otalgia. Most cases of malignancy usually present in the 6th & 7th decade.

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