

Research article

# Etiological Profile of Referred Otalgias in a Tertiary Care Hospital

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## ABSTRACT

**Background and Objectives** Otalgia (earache) is one of the commonest presenting complaints of the patients visiting ENT OPD and wide varieties of otological diseases are associated with it. Surrounding structural pathology of head and neck can at times manifest as otalgia (because of complex innervations of ear) known as referred otalgia. The term Referred Otalgia applied when the ear examination is normal, so it is important to search for the secondary cause in other structures like pharynx, larynx, teeth, TM, nose, sinuses, salivary glands, neck, and rarely thoracic structures like esophagus, bronchus and heart.

**Material and Methods:** A prospective study was conducted in the department of ENT – HNS in Janaki Medical College Teaching Hospital from January 01, 2019 to July 31, 2020 with ear pain only. All patients are subjected to full history and ENT examination, in addition to examination of Temporomandibular joint (TMJ) and neck. Some patients were sent for audiological and radiological assessment according to the finding in the examination and some had maxillofacial or orthopedic consultation. Data were analyzed, primary and referred otalgia was recorded.

**Results:** Out of 607 patients with otalgia, 243(40%) had referred otalgia of this 39% were men and 61% were women. Commonest etiology of referred otalgia was dental causes followed by TMJ dysfunction. 3% patient had underlying malignancies. 37% had right earache, 42% had left earache and 21% had bilateral earache.

**Conclusion:** A thorough clinical examination of surrounding structures particularly teeth and TMJ should be done as significant number of patient suffered from referred otalgia and while doing this malignancy should be kept in mind as etiology.

**Key words:** Earache, Referred otalgia, TMJ dysfunction

## INTRODUCTION

Ear pain or otalgia is one of the commonest symptoms that brings a patient to an ENT clinic, it affects any age group and may reflect a serious disease process in or outside the

ear. Therefore, Otorhinolaryngologists need to have a comprehensive knowledge about the anatomy and neuro anatomy of the ear and its related structures. The ear is consider that the only structure in the body of comparable

size that is supplied by sensory nerves from so many different neural segments [1].

The auriculotemporal branch of the mandibular division of fifth cranial nerve, greater auricular nerve (a branch of C3 cervical nerves), lesser occipital nerve (a branch of C2 and C3 derivation), auricular branch of the vagus nerve (also called Arnolds nerve), and twigs from the seventh cranial nerve all contribute to the sensory innervations of the auricle and external auditory meatus [2]. The tympanic plexus, which is composed of the Jacobson nerve (tympanic branch of the glossopharyngeal nerve) and the superior and inferior carotico-tympanic branches of the sympathetic plexus which is surrounding the carotid body, provides sensory innervations to the middle ear, including the medial aspect of the tympanic membrane. While the lateral aspect of the tympanic membrane is supplied by the facial nerve, the auricular branch of the vagus (Arnolds nerve) and the auriculo-temporal branch of the mandibular nerve [3].

Otalgia can be either primary (originating from pathologies of ear itself) or secondary (originating from pathologies other than that of ear but sharing the same nerve supply) known as referred otalgia. There can be different pathologies as a cause of referred otalgia ranging from pathologies of dental, tonsils, oropharynx, hypopharynx, laryngeal origin, temporo- mandibular joint dysfunction [4].

As wide variety of pathologies can cause referred otalgia and late diagnosis can sometime lead to incurable conditions, this study was done to highlight the various causes of referred otalgia and need for looking beyond primary site in case of otalgia. The study aimed to differentiate various

causes of referred otalgia and associate them with epidemiological profile.

## **MATERIAL AND METHODS**

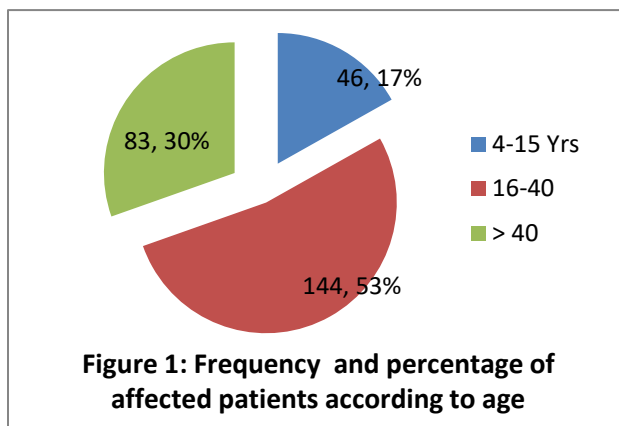
This study was conducted in the Department of ENT- Head and Neck surgery in Janaki Medical College Teaching Hospital from January 01, 2020 to July 31, 2020. Patients complaining of earache with normal ear examination were considered as referred otalgia.

Complete ear, nose and throat examination with that of head and neck with TM joint was done. Opinion of other specialty like dental and skin were also taken, relevant investigations like imaging, endoscopies and histopathological examination were also performed to reach at a diagnosis. Patients' data including age, sex, affected side and cause of otalgia were recorded. Obtained data has been analyzed among the epidemiological denominators like age, sex and incidence of various disorders among them.

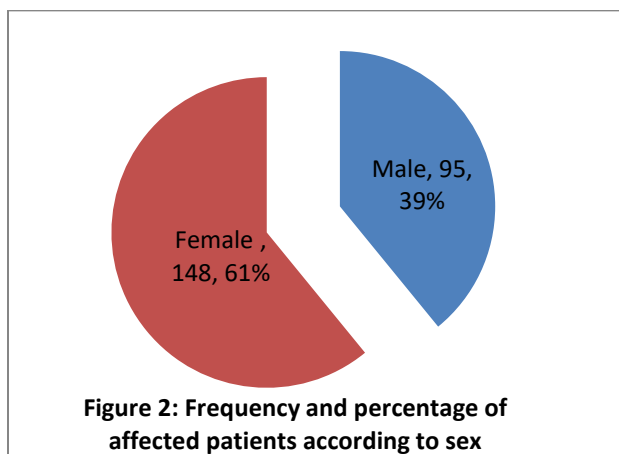
## **RESULTS**

In this study, out of 607 patients complaining otalgia, 243(40%) suffered from referred otalgia. Among them most of the patients were of age group 16 – 40 years as shown in figure 1. Sixty-one percent (61%) of patients were women while 39% were men as shown in figure 2. Among 243 patients, most of them had left ear and bilateral in least of the patients as shown in figure 3. In the study the commonest cause of referred otalgia was dental lesions(27%) followed by TMJ dysfunction (25%), other causes were cervical spine lesion (24%), tonsillitis (8%), post tonsillectomy (7%), pharyngitis (3%), sinusitis(2%), parotitis(2%), CA larynx(1%) and CA thyroid(1%) as shown in Table 1. The

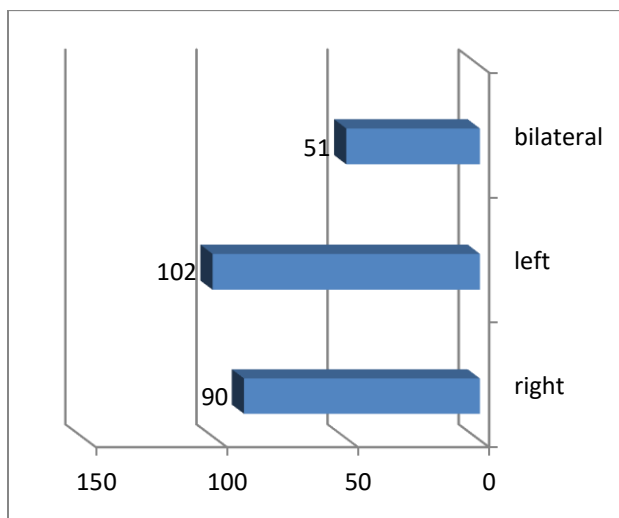
distribution of causes of referred otalgias according to age group is shown in Table 2.



**Figure 1: Frequency and percentage of affected patients according to age**



**Figure 2: Frequency and percentage of affected patients according to sex**



**Figure 3: Distribution of patients according to laterality of ear affected**

**Table 1: Causes of Referred Otalgia**

Diagnosis	Frequency	Percentage
Dental problem	64	27
TMJ problem	61	25
Cervial spine lesion	59	24
Tonsillitis	20	8
Post tonsillectomy	16	7
Pharyngitis	7	3
Sinusitis	5	2
Parotitis	5	2
CA larynx	3	1
CA thyroid	3	1
<b>Total</b>	<b>243</b>	<b>100</b>

**Table 2: Distribution of causes according to age group**

SN	Diagnosis	Age (years)			Total
		4-15	16-40	40	
1	Dental problem	18	23	23	64
2	TMJ problem	9	28	24	61
3	Cervial spine lesion	0	35	24	59
4	Tonsillitis	6	12	2	20
5	Post tonsillectomy	5	6	5	16
6	Pharyngitis	4	2	1	7
7	Sinusitis	3	2	0	5
8	Parotitis	1	4	0	5
9	CA larynx	0	1	2	3
10	CA thyroid	0	1	2	3
	<b>Total</b>	<b>46</b>	<b>114</b>	<b>83</b>	<b>243</b>

**DISCUSSION**

The present study found that 40% patients had referred otalgia which is higher in incidence as compared to the study of Benhood et al in Hamedan, Iraq (30.6%) [5]. While lesser in incidence in comparison to study (46%) was observed by Kiakojoori K, Tavakoli HR in Shahid Beheshti Hospital, Babol, Iraq [6]. In this study, children less than 15 years age group was the least affected group with only 46 cases and all among them had dental problem as a cause for referred otalgia. Neilan’s study also found that children suffer more from primary otalgia while more number of adults had referred otalgia which is consistent with our study [7]. But in study by Mohammad Hosain Taziki,

Golestan Uni, Gorgan, Iraq, referred otalgia were common in children [8].

In this study commonest cause for referred otalgia is dental problem (27%) which is seen most commonly among the pediatric and early adulthood group and as a cause of bilateral referred otalgia followed by TMJ pathology (25%). In study by Mohamad Hosain Taziki, toothache (62.8%) was commonest followed by pharyngitis (24.5%) [8]. In Kiakojori's study 45% had toothache as etiology of referred otalgia. (6) While dental cause amounted to be 50% in in Kim's study [9]. Similarly, a higher percentage was found in the study of Zhraa Abd-Alkader (64%) [10] and Gaurav Kataria et al (58.19%) [11]. Females were found to be more complaining from referred Otolgia in this study 148 patients (61%) while male patients 95 (39%). This agrees with most of the international studies as in the study of Geetha K [12] and Sang Hoon Kim [13], Mohammad Hosein [14]. In contrast to the study of Saurabh Gandhi [15] who found male was more affected than female and Sumitha study was equal percent [16]. Regarding the affected ear side by referred Otolgia, the present study shows that the left ear is more affected in 120 patients than the right one in 90 patients and it was found to be bilateral in 51 patients.

The most common cause of referred Otolgia in this study was found to be dental problem which occurs in 64 patients (27%), followed by TMJ problem in 61 patients (25%), then cervical musculoskeletal disorders in 59 patients (24%), rhinosinusitis in 5 patients (2%). So, this study has a closely similar results with the study of Sumitha R et al study, where TMJ dysfunctions was 36.9%, then dental causes 31.06%, pharyngitis 16.5% [16]. Keersmaecker's study found that out of 400 patients with TMJ dysfunctions,

75% have aural symptoms. From those, 42% have Otolgia [17].

In accordance with Jaber et al and Al-Sheikhli, this study reveals that most cases of non-otogenic otalgia that are referred to routine secondary otolaryngology centres are musculoskeletal and not of primary dental origin unlike the majority of published reports [18-19]. The age profile of our musculoskeletal group was lower than Jaber et al, but the breakdown of that particular cohort in our study was muscular rather than degenerative disease of the cervical spine [19].

## CONCLUSION

Ear pain or Otolgia is an important presenting symptom to ENT clinic with more than one third of those patients having referred pain, the commonest cause of referred Otolgia is dental problem which constitutes about one fourth of cases, most causes of referred Otolgia are related to the trigeminal nerve especially mandibular division, this is may be due to its length and numerous tributaries supplying structures in the head and neck region.

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## REFERENCES

1. Paparella MM, Jung TTK. Diseases of the Ear. Available at <http://sigmax.tripod.com/ent/paparella/pap0222.pdf>. Accessed on 3rd January, 2017.
2. Wengraf C. Otolgia. In: Cummings C, Fredrickson JM, Harker LA, eds. Otolaryngology Head & Neck Surgery, Vol. 2, 4th edn. St. Louis: Mosby 1998, 3100-1.

3. Gordon B. Hughes, Myles L. Pensak and John S. McDonald: Chapter 34: third edition. Otolgia, clinical otology.
4. Gandhi S, Soni HDK. Referred otalgia: epidemiological profile. Int J Otorhinolaryngol Head Neck Surg. 2017;3(2):250.
5. Behnoud F, Zandi M. Survey etiologic factor in otalgia and correlation with temporo mandibular joint in patient referred to ENT clinic in Emam Khomani hospital in Hamedan Jul – Nov 2000. MD. Dissertation. Hamedan University of Medical Sciences, College of.
6. Kiakojoori K, Tavakoli HR. Cases of referral otalgia in patients referred to Shahid Beheshti clinic Babol 1999. J Babol Univ Med Sci. 2002;5(1):41-3.
7. Y P Neilan RE, Roland PS. Otolgia. Med clin N AM. 2010;94(5):961-71.
8. Taziki MH, Behnampour N. A Study of the Etiology of Referred Otolgia. Iran J Otorhinolaryngol. 2012;24(4):69.
9. Kim DS, Cheang P, Dover S, Drake-Lee AB. Dental otalgia. J Laryngol Otol. 2007;121(12):1129-34. Cite.
10. Abd-Alkader T, Burra M. Etiology of Referred Otolgia; The Iraqi Post graduate Medical Journal 2013;12.
11. Kataria G, Saxema A, Kataria S, et al. Referred Otolgia: Etiological Spectrum. Journal of Research in Otorhinolaryngology - Head and Neck Surgery 2016;2: 5-7.
12. Geetha K. Siddapur, Kishan R. Siddapur. Clinical Profile of Referred Otolgia in a tertiary health center: a retrospective study. IJCRR 2014;6(14):17-24.
13. Sang Hoon Kim, et al. Clinical differences in types of Otolgia; J Audiol Otol 2015; 19(1): 34-38. <https://doi.org/10.7874/jao.2015.19.1.34>
14. Mohammad Hosein T. and Nasser B. A Study of the Etiology of referred Otolgia. Iranian Journal of Otorhinolaryngology 2012;24(69): 171-176.
15. Saurabh Gandhi, Hiren Soni; Referred Otolgia: Epidemiological profile; International Journal of Otorhinolaryngology and Head and Neck Surgery 2017;3. <https://doi.org/10.18203/issn.2454-5929.ijohns20171026>.
16. Sumitha R, Joseph N. Referred Otolgia - A case series; Asian Journal of Pharmaceutical and Clinical Research 2015;8.
17. Keersmaekers K. DeBoever, et al. Otolgia in patients with temporo-mandibular joint disorders; J Prosthet Dent. 1996;75:72-6. [https://doi.org/10.1016/S0022-3913\(96\)90421-7](https://doi.org/10.1016/S0022-3913(96)90421-7).
18. Jaber JJ, Leonetti JP, Lawrason AE, Feustel PJ. Cervical spine causes for referred otalgia. Otolaryngol Head Neck Surg. 2008;138:479-485.
19. Al-Sheikhli ARJ. Pain in the ear -with special reference to referred pain. J Laryngol Otol. 1980;94:1433-1440.

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