International Journal of Otorhinolaryngology and Head and Neck Surgery
Saraf A et al. Int J Otorhinolaryngol Head Neck Surg. 2020 May;6(5):944-947
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20201692

Causes of referred otalgia: a hospital-based study

Aditiya Saraf, Raies Ahmad Begh*, Deep Jyoti, Parmod Kalsotra

Department of ENT, SMGS Hospital, GMC Jammu, Jammu and Kashmir, India

Received: 21 February 2020
Revised: 31 March 2020
Accepted: 01 April 2020

***Correspondence:**
Dr. Raies Ahmad Begh,
E-mail: raies987@gmail.com

ABSTRACT

Background: The aim of our study was to evaluate various etiologies of referred otalgia.
Methods: The present study was conducted in the department of ENT, SMGS Hospital, GMC Jammu from January 2019 to January 2020. A total of 65 patients with complaint of pain in ear but normal ear examination was included in our study. All patients underwent complete ENT examination.
Results: The most common cause for referred otalgia was dental pathology (58.4%), followed by pharyngitis (16.9%), tonsillitis (10.7%), supraglottic cancer (7.6%), cervical spine pathology (3.07%) and peritonsillar abscess (3.07%).
Conclusions: Otalgia is a symptom with diverse causes. Though many causes are otogenic, referred pain from other regions of head and neck is also very common.

Keywords: Referred, Dental, Otalgia

INTRODUCTION

Otalgia or pain in the ear can be a consequence of otologic process (primary otalgia) or can arise from pathological processes and structures other than ear (referred otalgia). Primary otalgia can be due to local causes in external ear (like furuncle, impacted wax, otomycosis etc.) or middle ear (like acute otitis media, mastoiditis, aero-otitis media etc.).

Pain is a protective mechanism that occurs in response to tissue injury. In the case of referred pain, cell damage and stimulation of nociceptors occurs at sites remote from the area where pain is perceived, i.e. the sensation of pain will be generally felt in the territory the nerve serves (somatic dermatome) even though the damage originates elsewhere (visceral tissue).[1]

The ear receives sensation fibres from cranial nerves V (trigeminal), VII (facial), IX (glossopharyngeal), X (vagus) and cervical nerves (C2 and C3). These nerves have long courses in the head, neck and chest, which is why so many diseases can cause ear pain.[2]

The auriculotemporal nerve derived from mandibular division of trigeminal nerve (V) sends sensory afferents to tragus, anterior auricle, anterior wall of external canal and anterior portion of lateral tympanic membrane. Temporomandibular joint disease and dental pathologies are associated with referred otalgia via auriculotemporal nerve.[3]

The posterior auricular nerve, branch of facial nerve, supplies sensory afferents to posterior wall of external auditory canal, posterior lateral surface of tympanic membrane and posterior skin of auricle. Otalgia referred from facial nerve (VII) may occur following an attack of herpes zoster.[4]

Jacobson's nerve, a branch of glossopharyngeal nerve (IX) provides sensation to the middle ear, eustachian tube and medial surface of tympanic membrane. Lesions or

inflammatory processes of nasopharynx, palatine tonsil, soft palate or posterior third of tongue are associated with referred otalgia via cranial nerve IX.[4]

Arnold's nerve, branch of vagus nerve (X) provides sensation to inferior and posterior aspects of external auditory canal, concha and lateral surface of tympanic membrane. Thyroid lesions, lesions of larynx and gastroesophageal reflux can present with referred otalgia via cranial nerve X.[5]

Pathology of cervical spine (like osteoarthritis, spondylosis, disc herniation etc.) can present with referred otalgia via greater auricular and lesser occipital nerves, derivates from C2 and C3 of cervical plexus.[6]

This complex innervation serves an advantage as hearing is an important function and any pain in ear gives a sense of alarm.

Prompt assessment and treatment of referred otalgia needs detailed evaluation of its all possible etiologies, thus, the aim of our study was to evaluate various etiologies of referred otalgia.

METHODS

The present study was a prospective observational study, conducted in the department of ENT, SMGS Hospital, GMC Jammu from January 2019 to January 2020, after ethical approval by institutional committee. All patients with complaint of pain in ear but normal ear examination was included in our study.

Patients with pain in ear and abnormal ear examination (i.e. external or middle ear pathologies) were excluded from our study. Patients with previous history of ear surgery or head & neck surgery were also excluded from our study.

A thorough and relevant clinical history was taken from patients, involving- duration of ear pain, onset and progression of ear pain, nature of ear pain, aggravating/relieving factors of ear pain, any associated pain in neck, any history of dental pain, history of sore throat, foreign body sensation in throat or any history of neck swelling.

Complete examination of ear including examination of pinna, external ear canal and otoscopic examination of tympanic membrane was done.

Examination of nose by anterior and posterior rhinoscopy was done. Paranasal sinuses were also examined. Examination of oral cavity and oropharynx was done. Indirect laryngoscopy and/or flexible laryngoscopy was done to examine larynx. Complete examination of neck was done to evaluate any neck node or swelling.

Statistical analysis of the data was carried out by using SPSS 17.0. p values more than 0.05 were considered non-significant.

RESULTS

A total of 110 patients came with otalgia during our study period, referred otalgia (i.e. normal ear examination) was present in 65 patients (59.09%).

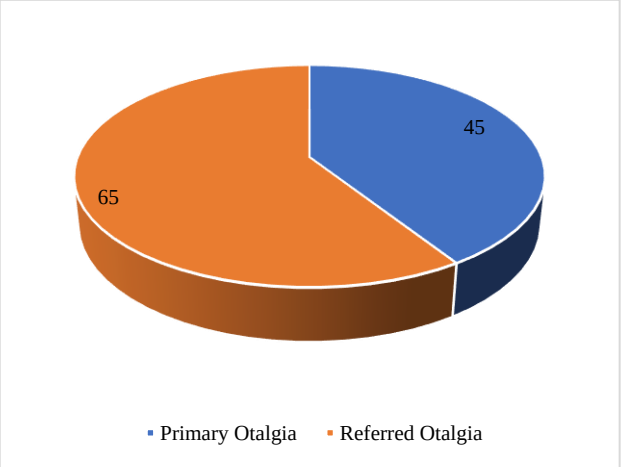

Figure 1: Patient distribution.

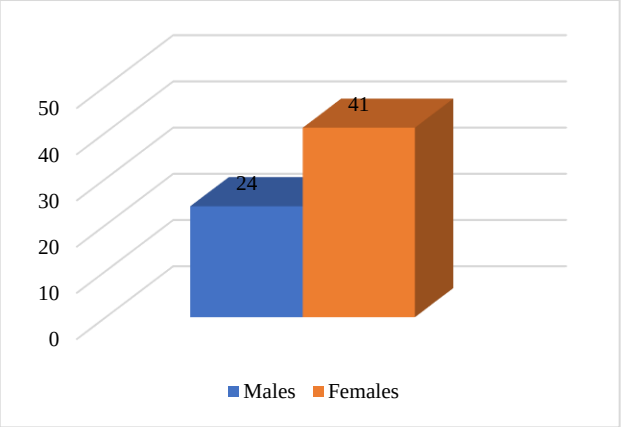

Figure 2: Gender distribution.

Out of 65 patients, 41 were females (63.07%) and 24 were males (36.9%). Patients with referred otalgia were within the age range of 10-60 years, with majority of patients in the age group of 31-40 years, the mean age being 36.7 years.

Out of 65 patients, right ear was involved in 35 patients (53.8%), left ear in 23 patients (35.3%) and 7 patients had bilateral otalgia (10.7%).

Out of 65 patients, 38 patients had dental pathology (58.4%), 11 patients had pharyngitis (16.9%), 7 patients had tonsillitis (10.7%), 5 patients had supraglottic carcinoma (7.6%), 2 patients had cervical spine

pathology (3.07%) and 2 patients had peritonsillar abscess (3.07%).

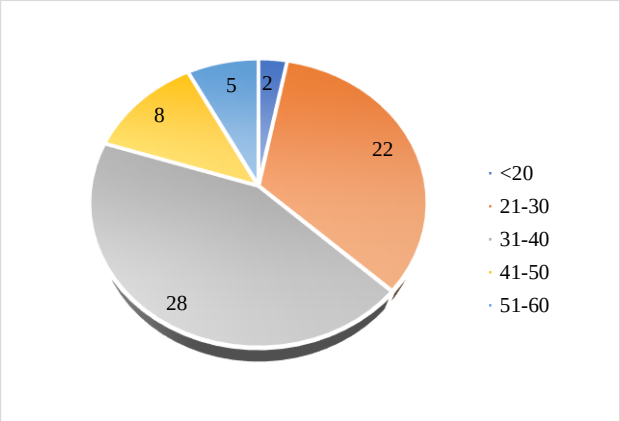

Figure 3: Age distribution.

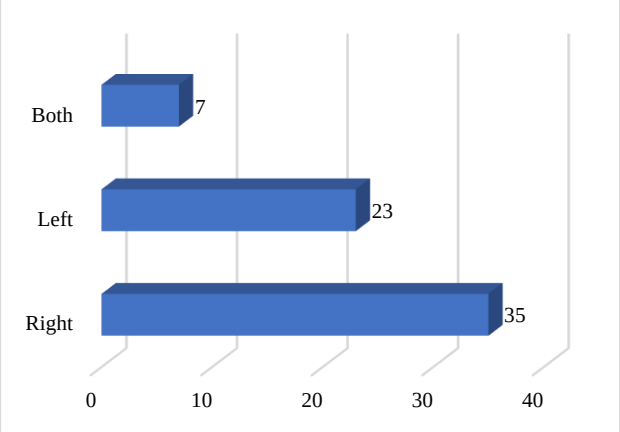

Figure 4: Laterality.

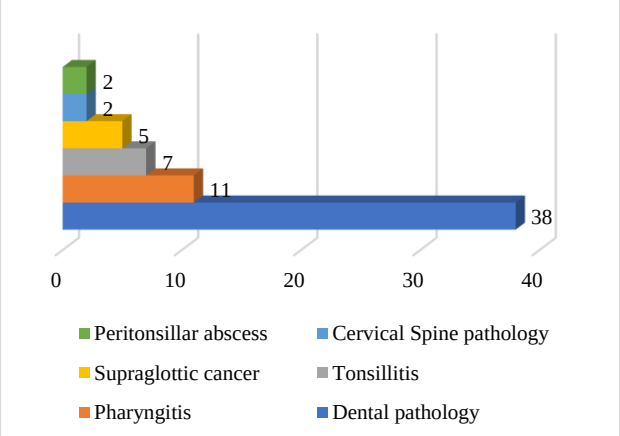

Figure 5: Etiology distribution.

Out of 65 patients, CN V was involved in 38 patients (58.4%), CN IX in 20 patients (30.7%), CN X in 5 patients (7.6%) and C2/C3 in 2 patients (3.07%).

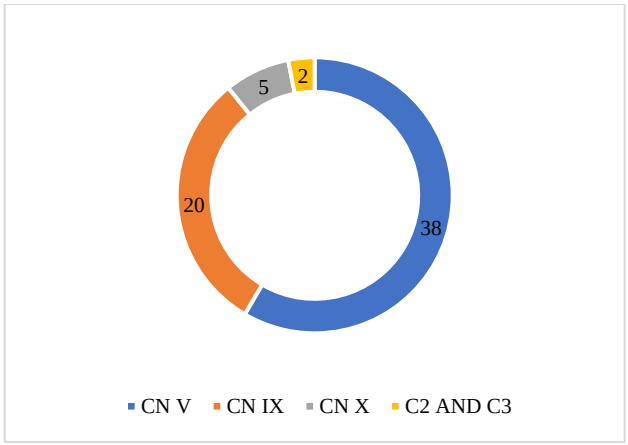

Figure 6: Cranial nerve distribution.

DISCUSSION

Ear pain indicates stimulation of the sensory nerves supplying the ear. This may be caused by local disease or in case of referred pain by pathology as distant as cranial cavity and chest.[7]

Although the mechanism of referred otalgia is slightly controversial, the most accepted theory is the convergence-projection theory, which states that multiple nerves converge onto a single shared neural pathway, with the central nervous system unable to differentiate the origin of stimulation. In referred otalgia, there is convergence of common sensory pathways between the complex sensory innervation supplying both the ear and cranial nerves innervating head and neck, with the CNS being unable to correctly pinpoint the location of pathology.[8]

In our study, out of 110 patients with pain in ear- 65 patients (59.09%) had referred otalgia. This observation was consistent with the studies conducted by Taboo et al, (64.5%), Siamak et al, (65%) and Kiakojoori et al, (46%).[9-11] However, Taziki et al, in their study showed 12.2% cases of referred otalgia only.[12]

There was female preponderance (63.07%) in our study, which was comparable to studies conducted by Jaber JJ et al, and Taboo ZA et al.[13] However, Kiakojoori et al, showed male preponderance in their study.

Majority of patients were in the age group of 31-40 years, with mean age of presentation being 36.7 years, which was consistent with study conducted by Taboo et al (38 years). However, Jaber et al, in their study showed mean age of presentation to be 64 years.

In our study, right ear was most frequently involved (53.8%), which was comparable to Jaber JJ et al. However, Taziki et al, showed more involvement of left ear.

In our study, the most common cause for referred otalgia was dental pathology (58.4%), followed by pharyngitis (16.9%), tonsillitis (10.7%), supraglottic cancer (7.6%), cervical spine pathology (3.07%) and peritonsillar abscess (3.07%). This observation was comparable to study conducted by Taboo et al, who showed dental problem to be the most common cause of referred otalgia.

Similarly, Kim et al and Taziki et al, showed that dental pathology was most common cause of referred otalgia.[14] However, Behnoud et al, showed temporomandibular joint disease to be most common cause. In our study, no patient presented with earache due to temporomandibular joint disease.[15]

In our study, cranial nerve V (58.4%) was most commonly involved to cause referred otalgia, followed by cranial nerve IX (30.7%), X (7.6%) and C2/C3 (3.07%). This observation was comparable to study conducted by Taboo et al.

CONCLUSION

Referred otalgia is a difficult and challenging symptom for otologists. As observed with our study, dental pathology can lead to ear ache revealing how important dental hygiene is. Also, malignancy of supraglottis can lead to earache. Thus, all cases of otalgia should undergo thorough and complete examination of oral cavity, pharynx, larynx and neck, if ear examination is normal.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Powers WH, Britton BH. Nonotogenic otalgia: diagnosis and treatment. Am J Otol. 1980;2:97-104.
2. Ely JW, Hansen MR, Clark EC. Diagnosis of ear pain. Am Fam Physician. 2008;77(5):621-8.
3. Shah RK, Blevins NH. Otalgia. Otolaryngol Clin North Am. 2003;36:1137-51.
4. Olsen KD. The many causes of otalgia- infection, trauma, cancer. Postgrad Med. 1986;80:50-63.
5. Thaller SR. Otalgia with a normal ear. Am Fam Physician. 1987;36:129-36.
6. Wazzen JJ. Referred Otalgia. Otolaryngol Clin North Am. 1989;22:1205-15.
7. Charlett SD, Coatesworth AP. Referred otalgia: a structured approach to diagnosis and treatment. Int J Clin Pract. 2007;61(6):1015-21.
8. Chen RC, Khorsandi AS, Shatzkes DR, Holliday RA. The radiology of referred otalgia. Am J Neuroradiol. 2009;30:1817-23.
9. Taboo ZA, Buraa MF. Etiology of referred otalgia. Iraqi Postgrad Med J. 2013;12(3):436-42.
10. Siamak M, Mohammad J, Maryam B. Prevalence of referred pain with pulpal origin in the head, face and neck region. IEC. 2008;3.
11. 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.
12. Taziki MH, Behnampour N. A study of the etiology of referred otalgia. Iran J Otorhinolaryngol. 2012;24(69):171-6.
13. Jaber JJ, Leonetti P, Lawrason A. Cervical spine causes for referred otalgia. Otolaryngol Head Neck Surg. 2008;138:479-85.
14. Kim D, Cheang P, Dover S. Dental otalgia. J Laryngol Otol. 2007;121:1129-34.
15. Behnoud F, Zandi M. Survey etiologic factor in otalgia and correlation with temporomandibular joint in patient referred to ENT clinic in Emam khomani hospital in Hamedan Jul-Nov 2000. Hamedan University of Medical Sciences, College of medicine: Hamedan; 2000.

Cite this article as: Saraf A, Begh RA, Jyoti D, Kalsotra P. Causes of referred otalgia: a hospital-based study. Int J Otorhinolaryngol Head Neck Surg 2020;6:944-7.