

Referred Otalgia: Etiology and Incidence Among 136 Patients in Hillah City, Iraq

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Abstract

Background: Prompt history and clinical examination are mandatory to fix the proper diagnosis of referred ear pain which sometimes needs the aid of laboratory, radiological assessments, and even examination under general anesthesia. **Objectives:** To diagnose cases of referred otalgia with the estimation of the incidence according to different age groups and sex. **Materials and Methods:** A prospective study was done in the ENT clinic in Hillah City, to evaluate 600 patients who presented with ear pain, 136 patients out of them were labeled as referred otalgia cases when the ear showed normal examination. The study started from January 2019 to February 2021. Physical examination with required investigations according to etiologies suspected for referred otalgia was done accordingly. **Results:** Out of 600 patients who presented with otalgia, 136 patients had referred otalgia (22.6%). The right ear was more affected than the left one (54%), whereas four cases had bilaterally referred ear pain. Of them, 57 patients had temporomandibular (TM) dysfunction (42%), 34 patients had pharyngeal pathologies including tumors (25%), 20 patients had cervical causes (14.7%), 11 patients had dental problems (8%), 8 patients had miscellaneous cases including salivary glands, oral cavity, lymph nodes, and long styloid process (5.8%), and 6 patients had nasal and sinus problems (4.5%). **Conclusion:** Ear pain could be due to remote etiologies rather than the ear especially when it is normal by examination. The pain is mainly from adjacent head and neck structures. Physical examination of those structures especially TM joints, teeth, pharynx, nose, and sinuses is important to identify the causes of ear pain. Malignancy may be one of the causes and should not be missed.

Keywords: Ear ache, etiology, incidence, referred pain

INTRODUCTION

Ear pain may be due to pathologies inside it or may be referred from surrounding head and neck pathologies and here it is labeled as referred otalgia.^[1] This happens because the ear shares a complex neurological innervation with other head and neck structures.^[2] The innervation of the ear comes through cranial nerves (V, VII, IX, X cranial nerves, C2, and C3 cervical plexus).^[3]

The most accepted theory explaining referred otalgia is the convergence-projection theory in which multiple nerves converge onto a single shared neural pathway. The central nervous system cannot differentiate the origin of sensory stimulation, hence being unable to pinpoint the site of pathology.^[3,4]

Referred otalgia in any patient needs proper examination and investigations according to the suspected etiology in

head and neck structures, which share the same innervation with the affected ear.^[5]

The aim of this study was to diagnose cases of referred otalgia with an estimation of the incidence according to different age groups and sex among patients in Hillah City, Iraq.

MATERIALS AND METHODS

Patients and study design

This is a prospective study designed to evaluate the incidence and etiology of referred ear pain in 600 patients

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attending the ENT clinic, Hillah City, Iraq for the period extended from January 2019 to February 2021. About 136 patients were labeled as referred otalgia after a normal ear examination. Proper history and thorough clinical examination were done including all the suspected regions in the head and neck to identify the etiological factor. A questionnaire form is used for every patient included in the study, it contains a lot of points in the history such as the age, gender, ear side, any associated otological or non-otological symptoms, and history of nasal, pharyngeal, laryngeal, or neck associated symptoms, which can be relevant to the pain.

Some of the patients were sent for audiological, radiological, and laboratory investigations. Other patients need consultation with a referral to a dentist, maxillofacial, or orthopedic specialist. The age of the patients started from 5 years for proper cooperation in history taking and clinical assessments. The age was divided into three groups: group 1 was from 5 to 16 years, group 2 was from 17 to 40 years, and group 3 was above 41 years.

Patients who had a history of sore throat, pharyngeal surgery, nose and sinus pathologies, or surgeries were excluded from the study to avoid interference with unknown cases of referred pain because they were already known to cause referred otalgia. One patient was treated as a case of pharyngitis for a long period, but indirect laryngoscopy showed a pyriform fossa tumor proved as malignant by biopsy.

Statistical analysis

All values were expressed as mean $\pm$ standard deviation. Data were analyzed by SPSS version 27 (SPSS, IBM Company, Chicago, IL, USA) and Microsoft Excel. Categorical variables were analyzed by Chi-square test.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. The study protocol, the subject information, and the consent form were reviewed and approved by a local ethics committee according to document number 622 on December 18, 2021.

RESULTS

Of 600 patients who presented with ear pain, 136 patients had referred otalgia (22.6%). The patients were divided into three groups: group 1 had 33 patients (24%), group 2 had 59 patients (44%), and group 3 had 44 patients (32%).

Out of 136 patients, 51 patients were males (37.5%), whereas 85 patients were females (62.5%).

Regarding the side of the affected ear, it was the right ear for 73 patients, while it was the left side for 59 patients. Also, 4 patients had bilateral otalgia, and 4 patients had bilateral referred otalgia mostly due to pharyngeal infections [Table 1].

Regarding the causes of referred ear pain TM joint dysfunction was at the top of the list of 57 patients (42%). The second cause was pharyngeal pathologies including malignancy in 34 patients (25%). Cervical causes were the third cause in the order of frequency in 20 patients (14.7%). There were dental causes in 11 patients (8%). In the miscellaneous group, which includes salivary glands, oral

Table 1: Incidence according to the side of the referred otalgia

Affected side	No. of patients	%
Right	73	54
Left	59	43
Bilateral	4	3
Total	136	100

Table 2: Etiologies of referred otalgia

Etiology of referred otalgia	No. of patients	%
TM joint dysfunction	57	42
Pharyngeal pathologies including malignancy	34	25
Cervical and related pathologies	20	14.7
Dental causes	11	8
Miscellaneous, including salivary gland, lymph nodes, oral cavity, and styloid process	8	5.8
Nasal and sinus problems	6	4.5
Total	136	100

Table 3: Gender distribution of referred otalgia cases

Etiology of referred otalgia	Female	Male	Total
TM joint dysfunction	32	25	57
Pharyngeal pathologies including malignancy	24	10	34
Cervical and related pathologies	12	8	20
Dental causes	8	3	11
Miscellaneous, including salivary gland, lymph nodes, oral cavity, and styloid process	5	3	8
Nasal & sinus problems	4	2	6
Total	85	51	136

Table 4: Etiology of referred otalgia in response to age groups

Etiology of referred otalgia	Group 1	Group 2	Group 3	Total
TM joint dysfunction	4	31	22	57
Pharyngeal pathologies including malignancy	18	10	6	34
Cervical and related pathologies	3	8	9	20
Dental causes	3	5	3	11
Miscellaneous, including salivary gland, lymph nodes, oral cavity, and styloid process	3	3	2	8
Nasal and sinus problems	2	2	2	6
Total	33	59	44	136

**Figure 1:** Pyriform fossa tumor**Figure 2:** X-ray shows the long styloid process

cavity, cervical lymph nodes, and styloid process, there were 8 patients (5.8%). The last causes in the list were nasal and sinus pathologies, which were 6 patients (4.5%) [Table 2].

Regarding the gender distribution of the symptoms the female was predominant in all the cases of referred ear pain [Table 3].

Pharyngeal infections were more predominant in group 1 than all other groups, whereas TM joint dysfunction was the main cause for referred pain in groups 1 and 2 [Table 4].

One case missed the diagnosis of pharyngitis in group 3, but it was proved as squamous cell carcinoma of pyriform fossa by biopsy [Figure 1]. One case of long styloid process (eagle syndrome) was detected as a case of referred ear pain in group 3 [Figure 2].

DISCUSSION

Out of 600 patients with randomized ear pain, 136 patients were labeled as referred otalgia after the exclusion of primary ear pathologies. After a careful history, clinical examination, laboratory, radiological investigations, and consultation with other specialties if needed confirmation of the diagnosis was done. In this study, 22.6% of patients were complaining of referred otalgia. Behrrod *et al.*^[6] found that the incidence of referred ear pain was 30.6%. In a study done by Geetha,^[7] the referred otalgia cases constituted 24.4%. Abdul-Kader found a high incidence of referred otalgia cases 64%^[8] which was a higher rate than our study in addition to other studies.^[9] However, Sumitha *et al.*^[10] reported a low rate of the disease (11.9%).

In this study, the patients complaining of referred ear pain were more than males (62.5%). This result was compatible with several authors.^[7,10] However, Gandhi and Soni^[11] revealed that males were more complaining of referred ear pain than females.

Our study showed the right ear was more affected than the left one (43%), while (4%) had bilateral ear otalgia. Several researchers found that the left side is more affected.^[1,10,12] Ijaduola^[13] showed that the right side was more affected than the left side.

The age incidence was higher in group 1 (17–40 years) than in other age groups (44%). Neilan^[14] showed that adults were more affected than children with referred otalgia. This result was compatible with several authors.^[7,15]

In our study, TM joint problems had priority in the list of etiological causes of referred ear pain followed by pharyngeal, cervical, and dental pathologies. Several authors worldwide reported a high incidence of TM joint dysfunctions as a major cause of referred otalgia.^[5,6,16-18]

Pharyngeal infections (18 patients) were more common in age (4–16 years old) than all other age groups. This result was consistent with a study done by Neilan.^[14] One case of pyriform fossa cancer in addition to a case of the long styloid process as causes of referred otalgia both were in the age group 3 (above 41 years old)^[19] [Figure 1].

CONCLUSION

Referred ear pain should have good attention during clinical practice. Examination of the structures that share the same innervation with the ear is mandatory to confirm the diagnosis. Cancer is sometimes an etiological factor that should not be missed.

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Conflicts of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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