

Research Article



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RHEUMATOID ARTHRITIS PATIENTS' PREVALENCE AND FORMS OF HEARING LOSS: AN ANALYSIS OF CORRELATIONS WITH AGE, GENDER, AND LENGTH OF DISEASE

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ABSTRACT

Background: One multisystem ailment with an uncertain cause is rheumatoid arthritis, a persistent polyarthritic syndrome. Between 60 and 62 percent of people with rheumatoid arthritis have hearing loss, with conductive hearing loss (CHL) being more frequent than sensorineural hearing loss (SNHL).

Aim: The purpose of the current study was to determine the forms and prevalence of hearing loss in rheumatoid arthritis patients as well as its relationships to age, gender, and length of disease.

Methods: Fifty individuals with rheumatoid arthritis were evaluated in this study and compared to fifty controls who did not have the disease. Following a thorough clinical examination of every participant in both groups, an audiological evaluation comprising tympanometry, acoustic reflex, and PTA (pure tone audiometry) was conducted.

Results: 66% of individuals had hearing loss, 16% had SNHL, and 50% had conductive hearing loss. According to tympanometry, 32 participants had right side A type and 18 subjects out of 50 instances had curve. On the left side, a type and as type curve were seen in 36 and 14 participants, respectively. On the right side, the acoustic reflex was present in 14, 6, and 30 patients, whereas on the left side, it was lacking in 16, 8, and 24 subjects. With an acoustic reflex and an A-type tympanogram in both ears, every participant in the control group had a hearing threshold of less than 25 dB.

Conclusion: Many people with rheumatoid arthritis have ear involvement, which manifests as hearing loss. Because PTA can aid in early diagnosis and better rehabilitation, it is essential to do auditory screening in rheumatoid arthritis patients.

Keywords: Conductive hearing loss, hearing loss, pure-tone audiometry, rheumatoid arthritis, sensorineural hearing loss

INTRODUCTION

Persistent inflammatory synovitis is a distinctive symptom of rheumatoid arthritis, or RA, a chronic multifactorial illness with an unclear cause. Around 0.8% of people worldwide have rheumatoid arthritis, and more women than men have been found to have it. There is a strong hereditary susceptibility to the condition, which often manifests in the fourth or fifth decade of life. Rheumatoid arthritis (RA) was once thought to be a condition that only affected the joints, but further research findings led to RA's classification as a systemic illness that has various extra-articular manifestations that affects nearly 40% of the subjects with symptoms. Subjects with anti-cyclic citrullinated peptide or high titres for rheumatoid arthritis factor exhibit these symptoms.¹

20% to 30% of people with rheumatoid arthritis usually have a rheumatoid nodule, and studies have shown that conductive hearing loss, or CHL, is present in RA patients and has been connected to an increase in disease activity. Ear involvement can lead to CHL, which is caused by middle ear synovial joint disease. Significant evidence from earlier research has demonstrated a connection between rheumatoid arthritis and hearing loss, with the bulk of studies describing conductive

hearing loss in RA. Additionally, middle ear illness that involves the ossicles is thought to be the underlying etiology of hearing loss.²

Incudomalleolar and incudostapedial joints are synovial joints that may have a role in the development of rheumatoid arthritis, according to certain theories. One of the main causes of conductive hearing loss in these individuals is thought to be ossicular necrosis and joint fibrosis. In the past, autoimmune inner ear disease has been reported in the literature. According to reports, SNHL is brought on by autoimmune damage to the inner ear from vasculitis or neuritis and is linked to an increased chance of developing rheumatoid arthritis.³

Ropes et al. provided the diagnostic criteria for individuals with rheumatoid arthritis, and Arnett et al. updated the criteria based on a variety of clinical and radiological evidence in order to establish a diagnosis in individuals with rheumatoid arthritis.

Tympanogram classification, which is based on changes in air pressure and middle ear compliance, is also frequently used to evaluate hearing loss. Additionally, the majority of hearing-impaired people have either sensorineural or conductive hearing loss. The purpose of the current study was to determine the forms and prevalence of hearing loss in rheumatoid arthritis patients as well as its relationships to age, gender, and length of disease.

MATERIALS AND METHODS

The purpose of the current case-control clinical investigation was to determine the forms and prevalence of hearing loss in rheumatoid arthritis patients as well as its relationships to age, gender, and the length of the condition. The research participants came from the Institute's ENT Department. Prior to their involvement in the study, all participants gave their written and verbal informed permission.

50 participants with rheumatoid arthritis were evaluated in the research and compared to 50 controls who were matched for age and gender but did not have RA. Participants in the study had to have normal tympanic membranes, be diagnosed with rheumatoid arthritis according to the American College of Rheumatology's updated criteria classification for RA, have had the disease for at least six months to twenty years, and be between the ages of twenty and sixty. Participants on any ototoxic medications, those with connective tissue disorders or autoimmune diseases other than RA, those with a history of otorrhea, middle ear effusion, Meniere's disease, ear surgery, head trauma, acoustic trauma, a perforated or scarred tympanic membrane, and those with a history of ear diseases were excluded from the study.

NSAIDs (nonsteroidal anti-inflammatory medicines) were stopped seven days before the audiological evaluation, which was followed by a thorough examination of the ears, nose, and throat before the hearing evaluation. This included an otoscopic examination, a tuning fork test, and a mastoid X-ray. PTA (pure tone audiometry) and impedance audiometry were used for the audiological evaluation. Hearing threshold, including bone conduction threshold and pure-tone air threshold, was measured using a clinical audiometer. Using a commercial impedance audiometer, stapedial reflexes and impedance audiometry were evaluated.

The chi-square test, Fisher's exact test, Mann Whitney U test, SPSS (Statistical Package for the Social Sciences), chi-square test, and student's t-test were used to statistically evaluate the collected data. When the p-value was less than 0.05, the significance threshold was taken into account.

RESULTS

Assessing the incidence and forms of hearing loss in rheumatoid arthritis patients as well as its correlations with age, gender, and the length of the disease were the goals of the current case-control clinical investigation. 50 individuals with rheumatoid arthritis were evaluated in this study and compared to 50 controls who did not have the disease. Following a thorough clinical examination of every participant in both groups, an audiological evaluation comprising tympanometry, acoustic reflex, and PTA (pure tone audiometry) was conducted. In terms of the research participants' kind of hearing loss, 14 and 20 people from the right and left ears, respectively, had normal hearing. Eight right and left ears each had SNHL, while 28 and 22 right and left ears had conductive hearing loss (Table 1).

When evaluating the tympanogram type in the right and left ears of the study participants, the findings indicated that 18 right ears and 14 left ears had the As type on tympanoplasty, while 32 right ears and 36 left ears had the type of recordings on tympanoplasty, as indicated in Table 2.

Regarding the investigation of acoustic reflexes in the right and left ears of the research participants, it was observed that, as described in Table 3, the acoustic response was present in 14 right ears and 18 left ears, missing in 3 right and 24 left ears, and delayed in 6 right and 8 left ears.

According to the study's findings, when comparing the hearing thresholds of the respondents' right and left ears, hearing threshold in right ear was <25dB in all 50 subjects and no control group subjects reported hearing threshold reading of

>25dB. Similar outcomes were seen in the control group for the left ear, where no subject had a hearing threshold reading more than 25 dB and all individuals displayed a hearing threshold reading of less than 25 dB. In contrast, 14 participants in the right ear and 20 in the left ear had a hearing threshold of less than 25 dB, whereas 18 subjects in the right ear and 30 subjects in the left ear had a hearing threshold of more than 25 dB (Table 4).

DISCUSSION

50 individuals with rheumatoid arthritis were evaluated in this study and compared to 50 controls who did not have the disease. Following a thorough clinical examination of every participant in both groups, an audiological evaluation comprising tympanometry, acoustic reflex, and PTA (pure tone audiometry) assessment was conducted.

In terms of the research participants' kind of hearing loss, 14 and 20 people from the right and left ears, respectively, had normal hearing. Eight right and left ears each had SNHL, while 28 and 22 right and left ears had conductive hearing loss. These findings were in line with those of McCabe BF⁵ and Ilham et al.⁶, whose authors reported hearing loss findings that supported the current investigation.

In terms of evaluating the tympanogram type in the right and left ears of the research participants, the findings indicated that 18 right ears and 14 left ears underwent tympanoplasty with the As type, whereas 32 right ears and 36 left ears underwent tympanoplasty with the A type.

These results were consistent with those of Nasution ME et al.⁷ and El-Raheem MA et al.⁸, whose research showed that the proportions of A and As types on the tympanogram were similar to the current study. Acoustic responses in the right and left ears of research participants were found to be absent in three right and twenty-four left ears, delayed in six right and eight left ears, and present in fourteen right and eighteen left ears, respectively. These findings aligned with those of research on acoustic reflexes by Milisavljević D et al. (9), and Chaitidis N et al. (10), where the authors' conclusions were similar to the current study.

When comparing the research participants' right and left ears, it was found that the right ear's hearing threshold was less than 25 dB in all 50 individuals, while none of the subjects in the control group reported hearing threshold readings more than 25 dB. Similar outcomes were seen in the control group for the left ear, where no subject had a hearing threshold reading more than 25 dB and all individuals displayed a hearing threshold reading of less than 25 dB. In contrast, 14 patients in the right ear and 20 in the left ear had a hearing threshold of less than 25 dB, whereas 18 subjects in the right ear and 30 subjects in the left ear had a hearing threshold of more than 25 dB.

These results were consistent with the findings of Gonçalves LF et al. in 2021 and Jeong H et al. in 2016, where the authors of both studies also reported a hearing threshold comparison that was comparable to the current investigation.

CONCLUSION,

The current study comes to the conclusion that many rheumatoid arthritis patients have ear involvement that manifests as hearing loss, taking into account its limits. In order to aid in early diagnosis and better rehabilitation, it is crucial to do auditory screening using PTA in individuals with rheumatoid arthritis.

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Hearing loss type	Right ear (n)	Left ear (n)
Normal	14	20
SNHL	8	8
CHL	28	22
Total	50	50

Table 1: Hearing loss type in study subjects in right and left ear

Tympanoplasty	Right ear (n)	Left ear (n)
As	18	14
A	32	36
Total	50	50

Table 2: Tympanogram type in study subjects in right and left ear

Acoustic reflex	Right ear (n)	Left ear (n)
Absent	30	24
Delayed	6	8
Present	14	18
Total	50	50

Table 3: Acoustic reflexes in study subjects in right and left ear

Hearing threshold	Right ear (dB)		Left ear (dB)	
	<25	>25	<25	>25
Controls	50	0	50	0
Cases	14	18	20	30
Total	50		50	

Table 4: Hearing threshold comparison in study subjects in right and left ear