



Original Article

Prevalence of severity and type of hearing loss in Rheumatoid Arthritis patients

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ABSTRACT

Rheumatoid arthritis (RA) is a chronic heterogeneous autoimmune disease characterized by painful joint inflammation which may cause destructive bone erosions. It also affects the auditory system and cause hearing loss. **Objective:** To find out the prevalence of Severity and type of Hearing Loss in Rheumatoid Arthritis Patients. **Methods:** Cross sectional descriptive study was conducted to find the prevalence of Severity and type of Hearing Loss in Rheumatoid Arthritis Patients. The study was performed at DHQ Hospital Bhimber, Mayo Hospital Lahore. The duration of data collection was 6 months (April 2022 to September 2022). Non-probability convenient sampling technique was used for data collection. Patients of both gender with ages 30 to 50 years were included. Patients with rheumatoid arthritis with other co-morbid factors were excluded. **Results:** Out of 117 patients, there were 33 (28.2%) male patients and 84 (71.8%) female patients. Most patients were in age group 41-45 years 38 (32.5%). There were 19 (16.2%) lower class patients, 93 (79.5%) middle class patients and 5 (4.3%) upper class patients. The prevalence of Hearing Loss in Rheumatoid Arthritis patients was high 70 (59.5%). Sensorineural hearing loss 66 (56.4) was most prevalent. Majority of them had mild to moderate degree hearing loss 50 (42.7%). **Conclusion:** The study showed the prevalence of Hearing Impairment in Rheumatoid Arthritis was high. The result of this study also concluded that majority of the patients had mild to moderate degree sensorineural hearing loss.

INTRODUCTION

Rheumatoid arthritis (RA) is a severe, persistent, autoimmune condition that mainly effects the synovial joints and causes joint inflammation and can lead to bone degradations. Estimates of the global prevalence of RA range from 0.24 to 1%, but vary considerably around the globe. The incidence of RA varies widely, with literature showing a frequency of 0.142% to 5.5% in Pakistan's southern and northern areas [1-3]. In RA, white blood cells target the individual's tissues, resulting in symmetrical joint discomfort, inflammation, tightness, and deformation. Among connective tissue diseases, this is the most prevalent rheumatic condition. It is a chronic and continuous inflammatory disease that starts with the synovial membrane and it ends to the degradation,

deformation, and dysfunction of articular tissues and function. The aetiology is unknown. Mental illnesses, climate, nutrition, race, trauma, inherited effects, endocrine malfunction, autoimmune disturbances, metabolic abnormalities, and infection have all been linked to the onset of rheumatoid arthritis. Rheumatoid arthritis symptoms and development differ greatly from person to person. Patients with rheumatoid arthritis encounter a variety of symptoms, including tight joints, sore joints, inflamed joints, tiredness, lack of appetite, and fever. Other illnesses or challenges may occur in these people as a result of the rheumatoid arthritis itself [4, 5]. Women are affected more than men, and are typically between the ages of 30 to 50 years. The systemic effects of RA include

involvement of the lungs, heart, brain, liver, eyes, and skin [6, 7]. RA treatments include glucocorticoids, nonsteroidal anti-inflammatory drugs (NSAIDs), and disease-modifying anti-rheumatic drugs (DMARDs). These drugs are vital in preventing additional joint degeneration and degradation, but they do not treat rheumatoid arthritis [8, 9]. Rheumatoid arthritis cause hearing loss. Sensorineural hearing loss (SNHL) and conductive hearing loss (CHL) are the two types of hearing impairment. Sensorineural hearing loss is typically irreversible and is caused by the destruction of inner or outer hair cells in the cochlea. Conductive hearing loss is characterized by more mechanical resistance anywhere on the sound wave's path via the outer ear, tympanic membrane, or middle ear [10, 11]. RA also causes hearing loss through variety of distinct potential pathways. Firstly incudomalleolar and incudostapedial junctions are tiny synovial joints that connect the malleus to incus and incus to stapes. These two joints transport vibrations between the bones in the middle ear, resulting in sound perception, these two joints could be harmed by the similar inflammatory and degenerative alterations as other joints in rheumatoid arthritis patients. Despite the fact that this approach may result in conductive hearing loss. Vasculitis might result in cochlear neuropathy, as component of a mononeuritis multiplex. The inflammatory process may result in severe degeneration of auditory hair cells, or the labyrinth may be the target of immune complex deposition. The traditional description of autoimmune labyrinth disease is quickly progressing bilateral sensorineural hearing loss with ear fullness, tinnitus, and vestibular impairment [12, 13]. RA are also known to cause ototoxicity. Salicylates and other NSAIDs, DMARDs drugs are examples of them. It causes permanent or temporary disturbance in auditory or vestibular function. Hearing loss is a common condition in the overall population and the consequences of hearing loss are devastating, affecting the functional, social, and psychological well-being of those afflicted [14, 15].

METHODS

Cross sectional descriptive study was conducted to find the prevalence of Severity and type of Hearing Loss in Rheumatoid Arthritis Patients. The study was performed at DHQ Hospital Bhimber, Mayo Hospital Lahore. The duration of data collection was 6 months (April 2022 to September 2022). There was Sample size of 117 patients which was calculated through online calculator. Sample size was calculated on the basis of prevalence of Hearing Loss 56.30% by using 95% confidence level and 5% confidence interval through online calculator [16]. Non-probability convenient sampling technique was used for data collection. Patients of both gender with ages 30 to 50 years

were included. Patients with rheumatoid arthritis with other co-morbid factors were excluded. A record keeping performa and pure tone audiometry (PTA) was used to accumulate the data. Identification of the Rheumatoid Arthritis patients through proper history. Rheumatoid arthritis patients was collected from rheumatology ward. Then they were brought to the Audiology OPD where patient was instructed about the rules of PTA. First of all headphones were placed on the ears and then patient was directed to response whenever he/she listens the tone and then whole procedure of PTA (Air conduction and Bone conduction) was performed. Data was analyzed through SPSS version 23.0 package.

RESULTS

Table 1 shows that out of 117 participants, most participants are in the age group 41-45 years are 38 (32.5%). There were 33 (28.2%) male participants and 84 (71.8%) female participants. There were 19 (16.2%) lower-class participants, 93 (79.5%) middle-class participants and 5 (4.3%) upper-class participants.

Sr no.	Variables	Categories	Frequency (%)
1	Age	30-35	27 (23.1%)
		36-40	34 (29.1%)
		41-45	38 (32.5%)
		46-50	18 (15.4%)
2	Gender	Male	33 (28.2%)
		Female	84 (71.8%)
3	Socioeconomic Status	Lower class	19 (16.2%)
		Middle class	93 (79.5%)
		Upper class	5 (4.3%)

Table 1: Demographics

Table 2 shows that there were mostly participants, 56 (47.9%) who have rheumatoid arthritis and belongs to duration of 0-5 years. 67 (57.3%) participants experiences hearing loss. 54 (46.2%) participants experiences bilateral hearing loss and 16 (13.7%) experiences unilateral hearing loss. Mostly participants 44 (37.6%) have hearing loss between group 1-2 years. 41 (35.0%) participants have tinnitus and 38 (32.5%) participants have tinnitus in both ears.

Sr no.	Variables	Categories	Frequency (%)
1	Duration of Rheumatoid Arthritis	0 to 5 years	56 (47.9%)
		6 to 10 years	33 (28.2%)
		11 to 15 years	23 (19.7%)
		16 to 20 years	5 (4.3%)
2	Do you feel hearing loss?	Yes	67 (57.3%)
		No	50 (42.7%)
3	If yes then do you feel hearing loss in both ears?	Bilateral	54 (46.2%)
		Unilateral	16 (13.7%)
		None	47 (40.2%)

4	If yes then tell me the duration of hearing loss?	less than 1 year	21 (17.9%)
		1 to 2 years	44 (37.6%)
		2 to 3 years	5 (4.3%)
		None	47 (40.2%)
5	Do you have tinnitus?	Yes	41 (35.0%)
		No	76 (65.0%)
6	If yes then do you have tinnitus in both ears?	Yes	38 (32.5%)
		No	79 (65.5%)

Table 2: Patient's Perception

Table 3 shows that the prevalence of Sensorineural hearing in rheumatoid arthritis patients was high, 66 (56.4%), conductive hearing loss 3 (2.6%) and mixed hearing loss 1 (0.9%). Majority of them have mild to moderate degree hearing loss 50 (42.7%).

Sr no.	Variables	Categories	Frequency (%)
1	Degree of hearing loss	Normal	47 (40.2%)
		Mild to Moderate	50 (42.7%)
		Moderate to Severe	19 (16.2%)
		Severe to Profound	1 (0.9%)
2	Type of hearing loss	Normal Hearing	47 (40.2%)
		Conductive Hearing Loss	3 (2.6%)
		Sensorineural Hearing Loss	66 (56.4%)
		Mixed Hearing Loss	1 (0.9%)

Table 3: Distribution of patient on the basis of type and degree of hearing loss

DISCUSSION

The result of the present study showed that prevalence of hearing impairment is 59.8%. Previous study conducted by Milisavljevic to assess hearing loss in patients with RA. According to the findings, 56.3% of rheumatoid arthritis patients reported hearing impairment [17]. The result of the present study showed that 56.4% have sensorineural hearing loss patients, 2.6% have conductive hearing loss, and 0.9% have mixed hearing loss. Previous study conducted by Lobo assessed hearing impairment in rheumatoid arthritis patients. Results showed that 80% of rheumatoid arthritis patients had sensorineural hearing loss, and 10% had conductive hearing loss and mixed hearing loss [18]. In contrast to a 2022 study by El Reheem, 29.09% of patients had sensorineural hearing loss, 1.8% had conductive hearing loss, and 5.45% had mixed hearing loss. This information was used to determine the relationship between the disease of rheumatoid arthritis and hearing impairment [19]. Result of the present study showed that 42.7% have Mild to Moderate degree hearing loss, 16.2% have Moderate to Severe degree hearing loss and 0.9% have Severe to Profound degree hearing loss. In contrast a study was conducted in 2018 by Nasution to investigate the role of rheumatoid arthritis in hearing impairment. Mild degree sensorineural hearing loss was shown to be the most prevalent in rheumatoid arthritis patients 38.1% [20]. In present study, the result showed

that 35.0% of the participants have tinnitus. Contrary to a study conducted in 2016 by Ilham to investigate the link between hearing impairment in rheumatoid arthritis patients. Tinnitus was shown to be more prevalent in rheumatoid arthritis patients 43.3% [21].

CONCLUSIONS

Conclusions of the study shows the incidence of Hearing Impairment in Rheumatoid Arthritis was high in prevalence. The result of this study concluded that majority of the patients have mild to moderate degree sensorineural hearing loss. Audiometric examinations should be included in RA assessments to detect and manage any hearing damage induced by the disease itself or by medication. Additionally, patients must be advised by their doctor of hearing impairment as a consequence of the disease, and this risk must be explained to them.

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