

ORIGINAL RESEARCH

Assessment of audiologic profile in patients with ankylosing spondylitis- A clinical study

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ABSTRACT:

Background: Ankylosing spondylitis is a human leukocyte antigen (HLA)-B27-associated chronic, inflammatory rheumatic disease. The present study was conducted to assess audiologic profile in patients with ankylosing spondylitis. **Materials & Methods:** The present study was conducted in the department of Otolaryngology. It comprised of 36 patients diagnosed of ankylosing spondylitis of both genders (Group I). Equal number of healthy subjects was taken as controls (Group II). In all patients careful otolaryngologic evaluation was done and administered to a standard audiologic assessment. Patients were subjected to Bath ankylosing spondylitis disease activity index (BASDAI) and the Bath ankylosing spondylitis functional index (BASFI). **Results:** Out of 36 patients, males were 20 and females were 16. 36 patients with hearing loss were in group I and 36 subjects without hearing loss in group II. The mean hearing thresholds were significantly higher in group I at 3 kHz ($p = 0.005$), 4 kHz ($p < 0.001$), 6 kHz ($p < 0.001$), and 8 kHz ($p < 0.05$) as compared to group II. The mean BASDAI score in group I was 4.92 and in group II was 4.54. Mean BASFI score was 6.14 and I group II was 5.76. The difference was non-significant ($P > 0.05$). **Conclusion:** Patients with Ankylosing Spondylitis have a greater prevalence of sensorineural hearing loss but that it was not correlated with either disease activity or functional status.

Key words: Audiologic, Ankylosing spondylitis, Hearing.

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INTRODUCTION

Ankylosing spondylitis (AS) is a human leukocyte antigen (HLA)-B27-associated chronic, inflammatory rheumatic disease characterized by sacroiliitis and spondylitis with formation of syndesmophytes leading to ankylosis. The disease can be accompanied by extraskeletal manifestations, such as acute anterior uveitis, aortic incompetence, cardiac conduction defects, fibrosis of the upper lobes of the lungs, cauda equina syndrome or renal amyloidosis.¹

The disease primarily affects the spine and sacroiliac joints and usually commences in the third decade of life. It affects men three times more often than women. The diagnosis of ankylosing spondylitis is based on clinical features, with

the clinical diagnosis usually supported by radiologic evidence of sacroiliitis.² Evaluation of extra-articular manifestations of ankylosing spondylitis is also important when considering different treatment options. The most common of these are anterior uveitis, psoriatic arthritis, inflammatory bowel disease, and pulmonary and renal abnormalities. Investigation of hearing loss in chronic rheumatic inflammatory diseases such as rheumatoid arthritis has always attracted attention. Many studies and reports have been published on hearing loss in rheumatoid arthritis.³

It has been found that sensorineural hearing loss (SNHL) also might be a manifestation of ankylosing spondylitis, although this association is controversial. The

physiopathologic mechanism of this hearing impairment is not yet clear; nevertheless, it has been suggested that it might be the result of vasculitis, granulomatous inflammation, or autoantibody production. It has been demonstrated that immune complexes are present in the sera of ankylosing spondylitis patients with SNHL, leading to the supposition that deposition of these circulating immune complexes in the inner ear or labyrinthine vessels could result in vasculitis or ischemic damage.⁴ The present study was conducted to assess audiologic profile in patients with ankylosing spondylitis.

MATERIALS & METHODS

The present study comprised of 36 patients diagnosed of ankylosing spondylitis of both genders (Group I). Equal number of healthy subjects was taken as controls (Group

II). All patients were informed regarding the study and written consent was obtained.

Data related to participants such as name, age, gender etc. was recorded. In all patients careful otolaryngologic evaluation was done and administered to a standard audiologic assessment, which consisted of pure-tone audiometry at eight frequencies (0.25, 0.5, 1, 2, 3, 4, 6, and 8 kHz), speech audiometry, and tympanometry. Speech audiometry included measurements of the speech reception threshold and the word recognition score, including during tests in noise. Patients were subjected to Bath ankylosing spondylitis disease activity index (BASDAI) and the Bath ankylosing spondylitis functional index (BASFI). Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 36		
Gender	Males	Females
Number	20	16

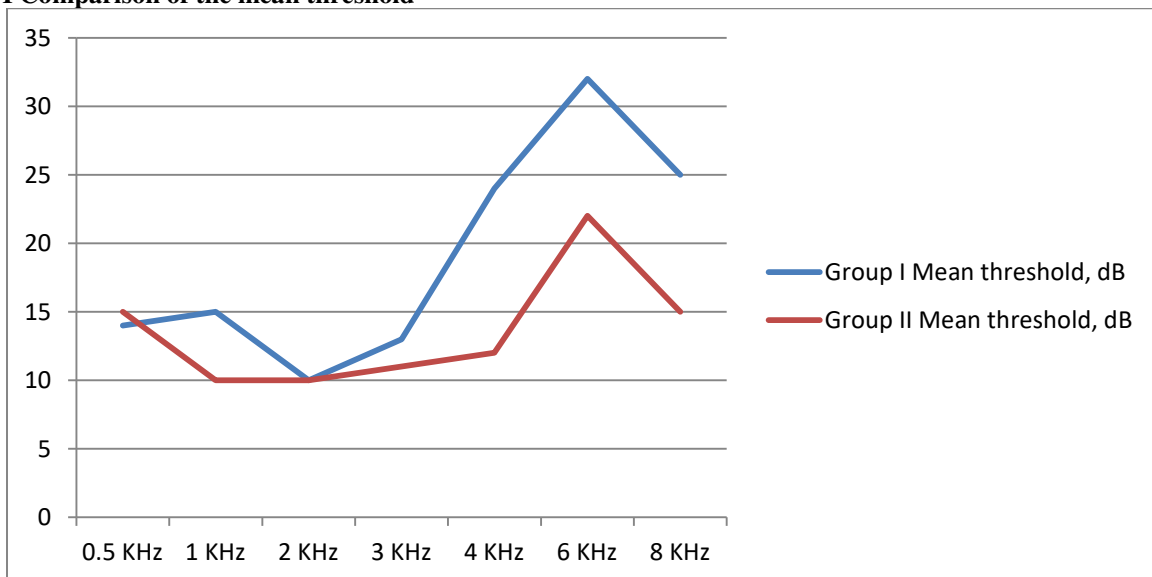
Table I shows that out of 36 patients, males were 20 and females were 16.

Table II Distribution in groups

Groups	Group I	Group II
Hearing	With hearing loss	Without hearing loss
Number	36	36

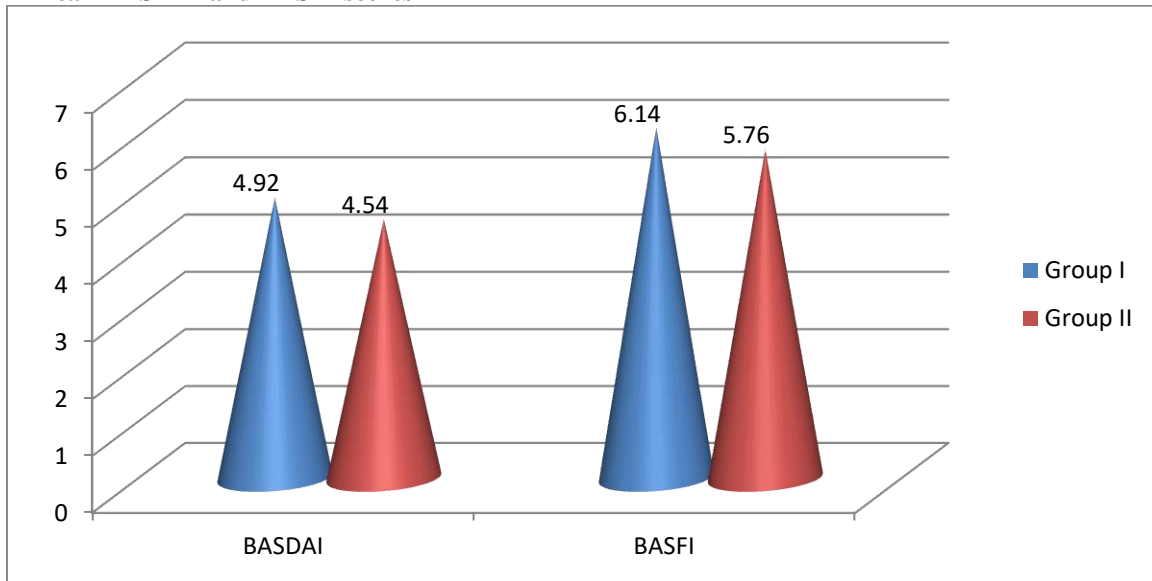
Table II comprised of 36 patients with hearing loss in group I and 36 subjects without hearing loss in group II.

Graph I Comparison of the mean threshold



Graph I shows that mean hearing thresholds were significantly higher in group I at 3 kHz (p = 0.005), 4 kHz (p < 0.001), 6 kHz (p < 0.001), and 8 kHz (p < 0.05) as compared to group II.

Graph II Mean BASDAI and BASFI scores



Graph II shows that mean BASDAI score in group I was 4.92 and in group II was 4.54. Mean BASFI score was 6.14 and I group II was 5.76. The difference was non- significant ($P > 0.05$).

DISCUSSION

Ankylosing spondylitis is a chronic, systemic inflammatory disorder which is strongly associated with HLA B27. Genes in the HLA complex are among the strongest predisposing genetic factors.

The HLA complex genes primarily involved are most often those encoding the peptide-presenting HLA class one or two molecules. A probable mechanism is preferential presentation, by the disease-associated HLA molecules, of peptides from auto-antigens to T cells.⁵ Autoimmune diseases are the result of an interaction between predisposing genes and triggering environmental factors, leading to loss of self-tolerance and an immune-mediated destruction of autologous cells and tissues. Immune-mediated mechanisms in ankylosing spondylitis are suggested by inflammatory histology and raised serum levels of immunoglobulin A and acute phase reactants. In an immunohistologic study of sacroiliac biopsies, CD4p and CD8p T cells and macrophages were present in the inflamed sacroiliac joints.⁶ The present study was conducted to assess audiologic profile in patients with ankylosing spondylitis.

In this study, out of 36 patients, males were 20 and females were 16. We found that 36 patients with hearing loss were in group I and 36 subjects without hearing loss in group II. Alatas et al⁷ found that the study group was made up of 18 men and 12 women, aged 25 to 58 years (mean: 46.5), who were diagnosed with ankylosing spondylitis. They compared their findings with a socially and demographically matched group of 30 healthy controls. All 60 participants underwent an audiologic assessment, consisting of pure-tone audiometry, speech audiometry, and

tympanometry. The average of the mean air-conduction thresholds at 0.5, 1, 2, and 4 kHz in the ankylosing spondylitis group was significantly worse than that of the controls ($p = 0.004$). A statistically significant difference was observed at frequencies greater than 3 kHz ($p < 0.05$). A subgroup of case patients who used only a tumor necrosis factor-alpha inhibitor exhibited better hearing thresholds than patients who used other drugs ($p = 0.01$). Differences in functional and disease activity scores between case patients with and without hearing loss were not statistically significant. Mean hearing thresholds were significantly higher in group I at 3 kHz ($p = 0.005$), 4 kHz ($p < 0.001$), 6 kHz ($p < 0.001$), and 8 kHz ($p < 0.05$) as compared to group II.

We found that mean BASDAI score in group I was 4.92 and in group II was 4.54. Mean BASFI score was 6.14 and I group II was 5.76. Corapci et al⁸ found that fifty-nine ankylosing spondylitis patients (118 ears) and 52 healthy control subjects (104 ears) were included. Pure tone audiometry at 250, 500, 1000, 2000, 4000 and 6000 Hz and immittance measures, including tympanometry and acoustic reflex tests, were performed in the patients and controls. Sensorineural hearing loss was found in 21 patients (35.5 per cent), bilateral in 15 patients and unilateral in six. Pure tone thresholds significantly differed between patients and controls at all frequencies. There was no statistically significant difference between the right and the left ears' thresholds at all frequencies, except at 4000 Hz in ankylosing spondylitis patients. The right ears' thresholds were higher than those of the left ears. Patients' pure tone average (PTA) thresholds were significantly different from those of controls in all three PTA groups (i.e.

250 Hz; 500, 1000 and 2000 Hz; and 4000 and 6000 Hz). The differences were most prominent in the higher frequencies.

Magarò et al⁹ described the case of an ankylosing spondylitis patient with conductive hearing loss secondary to arthritic involvement of the ossicular joints.¹² However, other studies have found an association between ankylosing spondylitis and SNHL, primarily in the higher frequencies, in the absence of middle ear pathology. Van et al¹⁰ suggested positive audiologic outcomes related to the use of anti-TNF α for the treatment of SNHL associated with spondyloarthropathies.

CONCLUSION

Authors suggested patients with Ankylosing spondylitis have a greater prevalence of sensorineural hearing loss but that it was not correlated with either disease activity or functional status.

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