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RESEARCH ARTICLE

OTORHINOLARYNGOLOGICAL FINDINGS INRHEUMATOID ARTHRITIS (RA) PATIENTS

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Abstract

Rheumatoid arthritis is a persistent inflammatory illness that impairs joint function by destroying cartilage and causing synovitis. It is a debilitating illness that affects every joint in the body. Additionally, it manifests extra-articularly, impacting the auditory system as well as ENT manifestation. Regarding Laryngeal Symptoms, dysphonia or changes in voice quality can be caused by autoimmune illnesses in general and RA in particular. These changes can be caused by either functional or anatomical l modifications.

Material and Method: 60 adults with rheumatoid arthritis classified into two groups the 1st group have disease duration less than or equal to 5 years and the 2nd group is more than 5 years. Disease activity was assessed using DAS 28 (Disease activity score). The entire patient underwent otoscopic examination of ears & Laryngeal examination as well asfull audiological evaluation including pure tone and speech audiometry and immetencemetryin the form of tympanometry and acoustic reflexes to assess middle function.

Results: A total of 60 patients, 40 patients with a disease duration of less than or equal to five years (1st group). The 2nd group had disease duration of more than five years they were 20 patients. In RA patients the disease activity score was done using DAS-28 CRP, the first group with mean 5.3±1.3, the second group had a mean 5.9± 1.4. As for the Otorhinolaryngological findings we found that otalgia &myringo sclerosis and rhinogrnic findings there are no significant difference between the two groups. As regard laryngeal findings there are no significant difference between the two groups as regard edema, GERD and laryngeal swellings. Hearing loss was present in 16 (40%) patients in the first group and 17(85%) patients in the second group with highly significant difference between the two groups,there was direct correlation between; disease duration &degree of hearing loss.

Conclusion: our research revealed that the duration of RA had little bearing on laryngeal findings. On the other hand, the length of the illness had an effect on rhinogenic findings. Additionally, duration of RA and hearing test showed a direct association.

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Introduction:-

Rheumatoid arthritis is a persistent inflammatory illness that impairs joint function by destroying cartilage and causing synovitis (1). It is a debilitating illness that affects every joint in the body. Remissions and exacerbations are hallmarks of the disease's progression, and chronicity frequently results in impairment. With a preference for tiny joints, it is distinguished by the emergence of extra-articular and articular lesions. (2).

Additionally, it manifests extra-articularly, impacting the auditory system, as seen by the inconsistent results of prior research linking the duration and activity of RA disease to hearing loss (HL). (3-6). ENT symptoms are important markers across the range of inflammatory rheumatic illness, from mild to potentially fatal manifestations. These symptoms may appear as early warning indicators or change as the illness worsens. It is critical to accurately identify the underlying physiopathology, whether it is infection, thrombosis, or inflammation. For the purpose of both the initial diagnosis and continuing treatment of patients with inflammatory rheumatic illnesses, appropriate management of ENT symptoms is essential. (7)

Regarding Laryngeal Symptoms, dysphonia or changes in voice quality can be caused by autoimmune illnesses in general and RA in particular. These changes can be caused by either functional or anatomical laryngological modifications, both of which have an effect on quality of life. Dysphonia should notify otolaryngologists, rheumatologists, and general practitioners of the possibility of laryngeal immersion when it occurs. According to Grossman et al., laryngeal symptoms were present in 50% of RA patients (8) Bamboo nodes may also be seen by laryngoscope in cases with RA, the first description of bamboo nodes. Transversally organized cystic yellowish bamboo nodes are seen in the submicroscope using endoscopic visualization. (9)

Objective of our study: was to assess the relationship between RA and hearing loss (HL), laryngeal manifestations and Rhinological manifestations.

Study design:
Cross sectional observational study.

Methodology:-

This study was conducted at Hearing and Speech Institute on RA patients referred from National Institute for Neuro-Motor System.60 adult patients diagnosed as RA diagnosed according to 2010 American College of Rheumatology/ European League against Rheumatism classification criteria for RA (10).They classified into two groupsgroup 1had disease duration equal to or less than 5 years and the group 2were more than 5 years.All participants provided consent and the study approved by the ethical committee of GOTHI.

All patients had full medical history and the disease activity was assessed using **DAS 28 (Disease activity score)** (11). The scoring ranges from< 2.6 Remission, low disease activity $2.6 \leq 3.2$, moderate disease activity $3.2 \leq 5.1$, and high disease activity meets the score >5. For otoscopic examination of ears Karl Stors 2.7 mm 0-degreelens was used, Karl Kaps microscope 250 lens was also used (if needed). For rhinologic assessment Karl Stors 4.0 mm 30-degree lenswas used. **Laryngeal examination**was done by Video- laryngoscopy to examine the larynx consist of KayPENTAX 70 degrees rigid oral endoscope, colored camera (Toshiba IK-M43A, Model 9211 PHL), constant halogen light source for illumination 9100 B with a 150-Watt halogen lamp, video recorder model 9221and a screen. **Full audiological evaluation**; including pure tone audiometry, and speech audiometry was done by using Audiometer InteracousticAC40. Assessment of middle ear function was done in form of tympanometry and acoustic reflex threshold was done using ImmittancemeterInteracousticsAZ26.

Inclusion criteria:
Patients with RA were included in the present study. **Exclusion criteria:** Patientswith past history of hearing loss & Patients with secretory otitis media (OM) or chronic suppurative OM&Patients with congenital malformation of ears causing hearing loss and Patients with change of voice before the onset of RA.

Statistical Analysis:
With the help of the Statistical Package for Social Science (SPSS 15.0 for Windows; SPSS Inc, Chicago, IL, 2001), the gathered data was updated, coded, tabulated, and brought into a PC. Data were shown, and appropriate analysis

was carried out in accordance with the kind of data found for each parameter. When it comes to numerical data, descriptive statistics are performed using the mean, median, standard deviation (± SD), minimum and maximum values (range). The percentage and frequency of non-numerical data

Analytical statistics:
To determine the statistical significance of the difference between the means of the two research groups, the Independent-Samples T Test was employed. Mann-Whitney Test used to find out if there is a difference in the values of a specific variable between two groups, the degree of correlation between two quantitative variables was evaluated using Spearman's Correlations. The intensity and direction of the association between two variables are defined by the correlation coefficient, symbolically represented as "rho". to investigate the association between two qualitative variables, the Chi-Square test was employed. To compute Fisher's precise Chi-Square test, a table that does not yield

P- value: level of significance: P>0.05: Non-significant (NS)& P≤ 0.05: Significant (S).

Results:-

This studyincluded 60 patients, whose demographic data is listed as follows: group 1 with disease duration of less than or equal to five years was 40 patients, 4(10%) males and 36 (90%) females. The group 2 had disease duration of more than five years they were 20 patients, 3(15%) males and 17 (85%) females. The mean age of group 1 was 43±10.9 years and the mean age of group 2 was 48.6 ±5.7 years respectively.

DAS-28 was used to calculate the disease activity score for RA patients, group 1 with mean 5.3±1.3, and group 2 had a mean 5.9± 1.4. The morning stiffness duration in group 1 is 29.5±18.6 minutes and group 2 is 36.5±18.6 minutes.

As for the Otorhinolaryngological findings we found that otalgia present in 17(42.5%) patients ingroup 1 and 6 (30%) in the group 2, ear finding in form of myringo sclerosis was present in 14(35%)patients in group 1 and 11(55%) patients in group 2, as for rhinogrnic findings there were 17(42,5%) in group 1and 9 (45%)in group 2, nasal polyps present in 11 (27.7%) in group 1 and 1(5%) in group 2, the difference between the two groups is significant.

Atrophic changes were present at 6(15%) cases in group 1 and 8(40%) patients in group 2 accompanying important difference among the two groups. Stridor was present in 2 (5%) cases in group 1 and 2(10%) in group 2. Edema at vocal fold was present at 17(42%) subjects at group 1 and 4(20%) patients at group 2. GERD was present 14(35%) in group 1 and 9 (45%) subjects at group 2. Swelling at vocal fold was present at 3(7.5%) cases in group 1 and 0 subjects at the group 2. Tinnitus was present in 15(37.5%) in group 1 and 15 (75%) subjects in the group 2 accompanying highly significant difference between the couple groups. Hearing loss was present in 16 (40%) patients in group 1 and 17(85%) in the group 2with the difference between the two groups is highly significant. Degree of hearing deficit was ranked from mild, moderate and severs form. The percentage of severe form in group 1 was 2(10%) patients it was higher than of group 2 (0%). Those differences were statistically highly significant as presented in table (1)

Table (1):- Comparison between disease duration groups regarding Otorhinolaryngological findings.

	Group 1 ≤ 5 years (n=40)	Group 2 >5years (n=20)	Total (n=60)	X2	P Value	Sig.
Otalgia	**17(42.5%)**	**6(30%)**	**23(38.3%)**	**0.88**	**0.408**	**NS**
Ear findings (Myringo sclerosis)	**14(35%)**	**11(55%)**	**25(41.7%)**	**2.19**	**0.139**	**NS**
Rhinogenic findings	**17(42.5%)**	**9(45%)**	**26(43.3%)**	**0.03**	**0.854**	**NS**
Nasal polyps	**11(27.5%)**	**1(5%)**	**12(20%)**	**4.22**	**0.037**	**S**
Atrophic changes	**6(15%)**	**8(40%)**	**14(23.3%)**	**4.66**	**0.035**	**S**
Stridor	**2(5%)**	**2(10%)**	**4(6.7%)**	**0.5**	**0.595**	**NS**
Edema at vocal fold	**17(42.5%)**	**4(20%)**	**21(35%)**	**2.97**	**0.150**	**NS**
GERD	**14(35%)**	**9(45%)**	**23(38.3%)**	**0.56**	**0.543**	**NS**

Swelling at vocal fold		**3(7.5%)**	**0**	**3(5%)**	**1.58**	**0.544**	**NS**
Tinnitus		**15(37.5%)**	**15(75%)**	**30(50%)**	**7.5**	**0.001**	**HS**
Hearingloss		**16(40%)**	**17(85%)**	**33(55%)**	**10.9**	**0.001**	**HS**
Degree of hearing loss	**Mild**	**16(40%)**	**9(45%)**	**25(41.7%)**	**21.01**	**<0.001**	**HS**
	Moderate	**0**	**6(30%)**	**6(10%)**			
	Sever	**0**	**2(10%)**	**2(3.3%)**			

Table (2):- Correlation between disease duration, hearing degree.

		Degree of hearing loss
Disease duration (months)	**Rho**	**0.490**
	P Value	**<0.001**
	Sig.	**HS**

There was direct correlation between; disease duration & degree of hearing loss as shown in table (2).

As for drugs usagethe percentage of drug usage for group 1 washigher than that for group 2. That difference was statistically highly significant. As shown in figure (1)

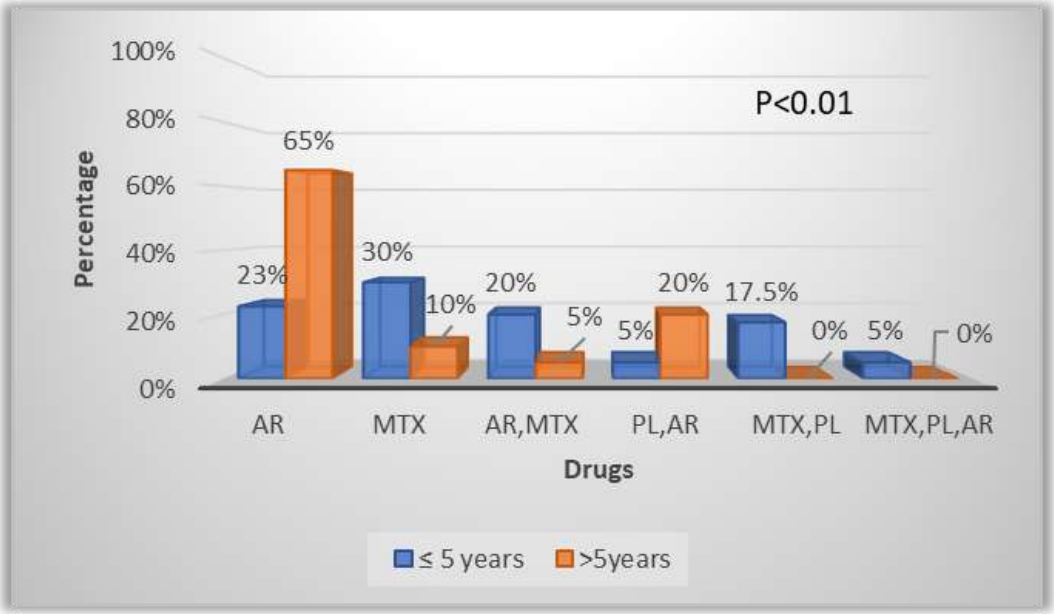

Figure (1):- Bar chart representing Comparison between disease duration groups regarding Drugs.

Discussion:-

The primary feature of (RA) is persistent inflammation of the joints, however there are also frequently several peripheral inflammatory symptoms of the disease. RA may cause chronic synovitis, which can destroy bone and cartilage and compromise joint function. Furthermore, extra-articular symptoms of RA that affect other organ systems, like changes to the auditory system, are possible. (12)

As for RA incidence in our study, we discovered that it affects women (88.3%) more frequently than men (11.75%). In terms of age, the mean age of the first group was lower than the mean age of the second group, indicating that RA is more prevalent in females than in males and that the risk of having RA varies with age this also reported in a study by Eriksson and colleagues (13)

Regarding the DAS-28 score, the results corroborated a study by Aletaha and his colleagues, which indicated no statistically significant difference between the two variables and no correlation between the two variables and the length of the disease or the change in disease activity (14). Another study done byAndrea and colleagues (15) found that the odds of achieving remission detected by DAS-28 decrease with longer duration of disease this concur with our study as we found that the patients with longer disease duration as higher DAS score than those with less disease

duration, as DAS -28 does not depend only on disease duration but on other factors as timing of introducing DMARDs and which type and introduction of biologicals or not and compliance of patients to drugs.

One of the most common clinical symptoms of RA that people report is morning stiffness. the correlation between disease duration and morning stiffness duration showed no statistically significant difference between them, this went with a study done by Dana and Colleagues (16) who stated that there is no statistically significant difference between the duration of morning stiffness and disease duration. As for study done by Khan and colleagues (17) stated that MS duration was significantly associated with DAS28 score, as morning stiffness duration and severity depend on the disease activity.

As for the correlation between disease duration and drugs that had been taken by the patients we found that there was a difference in drugs prescribed to the patients which differ along the disease duration, and that using combined DMARDs early in RA was more than using them in longer disease duration as in early disease using of combined drugs aiming to reach remission early this went with a study done by Vappu and collegues (18) who claimed that compared to patients treated first with DMARD monotherapy, patients treated initially with a combination of DMARDs have less long-term damage.

As regard ear findings Myringo sclerosis which is the deposition of calcium in thetympanic membrane this can be due infection, trauma and or autoimmune disorders, it is an observation rather than symptoms. It was found in 25 (41.7%), 14(35%) of which in the first group and11 (55%) in the second group, with no evident history of chronic ear infection or trauma in either group. There is no solid study correlates myringo sclerosis to rheumatoid arthritis. As regard Otalgia (referred) temporomandibular joint dysfunction TMJD was found in 23 (38%) of which 17(42.5%) in the first group and was the alerting symptom to ENT doctor for referral to the rheumatology department in 8 patients this goes with the work of Vito Crincoli and colleagues (19)as TMJD and oral symptoms were early seen in rheumatoid arthritis and his explanation to decrease symptoms in the first year of diagnosed cases to early management. This explains the reduced percentagein the second group in our study 6(30%)

Rhinogenic findings assist by endoscopic nasal examination were as follows: in the first group 17(42%) and 9(45%) in the second group this goes with Bacciuand colleagues (20) results where allergic rhinitis and chronic rhino sinusitis were found in group of autoimmune rheumatic disorders in his study. Our results were sub-classified to nasal polyposis which was found in 11(27.5%) in the first group and 1(5%) in the second group this goes with the results of Bacciu and colleagues (20) where allergic rhinitis was often complicated by nasal polyposis,in our case second group were under medications which improved the symptoms and reduced the percentage.

As regard atrophic changes were found in 14(23.3%) of which 6(15%) in the first group, 8(40%) in the second group. Compared with Pereira and colleagues (21) rate was much lower this can be attributed to the difference in response to altered autoimmune disorders in his study where it was at highest percentage in Wagner's granulomatosis.

Based on the video-laryngoscopic examination, edema was found in 42.5% and 20% of RA patients in groups 1 and 2, respectively. There was no statistically significant difference observed (p-value = 0.150), suggesting that the larynx is unaffected by the duration of the disease. This result contradicts the work by Beirith and colleagues (22). Our results are in line with those of Castro and colleagues (23) who similarly found that laryngeal edema was present in 14.8% of RA patients. Furthermore, Bozbas and colleagues (24) found no evidence of a correlation between laryngeal issues and the duration of the condition. The results of our investigation indicated a link between RA and GERD or edema. This result is probably influenced by both the patients' drugs and the illness itself. The robust association between laryngeal findings and gastro-esophageal reflux disease has also been shown in numerous investigations. For instance, research by Kando and colleagues (25) and Gomez (26) found that over 60% of patients experienced symptoms and indicators of pharyngeal-laryngeal reflux. 70% of RA patients have GI problems, and 50% of them also have chance of having lower GI problems, according to a research by Zahi and colleagues (27). Since the majority of the patients in the study groups had been taking reflux medication since the start of their illness due to side effects from their RA treatment, there was no appreciable difference between the two groups in terms of having GERD. In group 1 of our investigation, the number of people with vocal fold swellings was limited to three. This observation is present in people with a history of both phono-traumatic behavior and gastro-esophageal reflux disease. A research by Immerman and colleagues (28) found that vocal nodules are

indicative of laryngeal involvement in 2% of individuals. It is reasonable to believe that RA and/or the drugs used to treat it may affect the larynx in an indiscriminate manner.

As regards to incidence of tinnitus we reported that 75% of group 2(RA≥5 years) had tinnitus, while only 37.5%of group 1(RA ≤5 years) had tinnitus, and also incidence of HL was higher in group 1(85%) than group 2(40%).This agreed with Torere et al. (1) who reported that the auditory system may be directly impacted by rheumatoid arthritis (RA) complications or as a result of side effects from therapy. An inflammatory inner ear illness brought on by rheumatoid arthritis may manifest as mixed symptoms, sensorineural hearing loss (SNHL), conductive hearing loss, or tinnitus.

In the current study we found there was direct correlation between; disease duration & degree of hearing loss. Elnagdy et al. (30) also discovered a relationship between the length of RA and pure tone audiometry in their study. Additionally, they discovered a strong correlation between hearing loss affecting mainly high frequencies and extended RA duration. Nasution and Haryuna(31) and Öztürk et al. (32) also recorded that the longer the RA duration, the more advanced the stage of disease.

Stiffness in the ossicular chain results from an extension of the disease's duration. A reduction in the ossicular chain's flexibility may result from inflammation during the active stage of the disease and the fibrosis that follows. Inner ear damage in patients with longer-term disease may result from the ototoxic medication use combined with the pathophysiology of RA. [33]. Conversely, several researchers found no connection between the length of the illness and RA patients' decreased hearing. (34) , (35).

Conclusion:-

Our research revealed that the length of the RA sickness had little bearing on laryngeal findings. On the other hand, the length of the illness had an effect on rhinogenic findings. Additionally, the length of RA disease and hearing test showed a direct association.

Recommendations:-

Instead of treating medicine as several specialties, physicians should approach it as a single field. Because all specialties interact with one another, there is a potential relationship between any given sign or symptom and another speciality. The patient can avoid suffering from a delayed diagnosis and treatment, along with all of its associated complications, by seeking early referral at the first sign of suspicion.

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