ORIGINAL ARTICLE

ULTRASONOGRAPHY FEATURES OF SALIVARY GLAND IN PATIENTS WITH RHEUMATOID ARTHRITIS AND SECONDARY SJOGREN SYNDROME

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 No conflict of interest,
Personal financial

ABSTRACT

The aim of this study was to detect the ultrasonographic features of salivary glands in patients with rheumatoid arthritis patients and secondary Sjogren syndrome

Methods: This cross sectional study was carried out in Rheumatology and Rehabilitation department, Faculty of Medicine, Zagazig University Hospitals.All paitents included were evaluated by clinical examination and salivary gland ultrasonography.

Results Sexty eight patients were included in our study ,most of them were female 88.3% . the disease duration was 9.31±2.4 **.** the median value for disease activity (DAS28) was 2.5(mild disease activity),the ESR median value was 30 .RF median value was 16. CRP median value was 18 , Anti CCP median value was 19.5 **.** Ultrasonographic features of salivary glands in patients with rheumatoid arthritis and secondary sjogren syndrome shows **hypoechoic areas** in (67.6%) of right parotid gland ,and (47%) of left parotid gland , (48.5%)of right submandibular gland, (44%) left submandibular gland . (88.2%) of right parotid gland showed **heterogenic areas** ,and (82.3%) of left parotid gland , (41.1%) of right submandibular gland, (73.5%) of left submandibular gland. **Hyperechoic bands** were detected in (80.8%) of right parotid gland ,and (85.2%) of left parotid gland , (42.6%) of right submandibular gland, (48.5%)of left submandibular gland. **fatty infiltration** were noticed in (10.2%) of right parotid gland ,and (11.7%) of left parotid gland , (20.5%) of right submandibular gland, (39.7%) of left submandibular gland. **calcifications** were identified in (4.4%) of right parotid gland ,and (8.8%) of left parotid gland , (4.4%) of right submandibular gland, (2.9%)of left submandibular gland. The **posterior border** were visible in (57.3%) of right parotid gland ,and (48.5%)of left parotid gland , (89.7%)of right submandibular gland, (88.2%)of left submandibular gland.There is no significant correlation between disease activity and Ultrasonographic features of salivary glands in patients with rheumatoid arthritis and secondary sjogren syndrome.

Conclusion: Musculoskeletal Ultrasonography is a very   helpful tool in detection of salivary gland ultrasonographic abnormalities at patients with rheumatoid arthritis and Sjogren Syndrome.

Keywords: sjogren's syndrome, musculoskeletal ultrasound, rheumatoid arthritis.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, progressive, autoimmune inflammatory disease linked to articular, extra-articular and systemic effects. RA has been reported to affect 0.5–1% of the adult population in developed regions **[1]**

Sjögren syndrome is a chronic autoimmune disease associated with   lacrimal and salivary lymphocytic salivary lymphocytic infiltration leading to clinical symptoms of keratoconjunctivitis sicca and xerostomia.In a community setting, it is relatively hard to perform salivary   gland biopsy or reliable diagn

ostic tests for the involvement of the salivary gland in a   suspected Sjögren syndrome (SS) patient **[2]**. The affection of salivary glands is a significant characteristic of SS and is traditionally evaluated on the basis of unstimulated whole salivary flow rate, salivary scintigraphy or parotid sialography, as used in the criteria set by the American Consensus Group.**[3].** On the other hand unstimulated whole salivary flow has restricted reproducibility **[4]**

Salivary gland ultrasonography (SGUS) is simple, non-invasive, widespread, non-irradiating and less expensive than other imaging techniques.**[5]**

The aim of this study was to detect the ultrasonographic features of salivary glands in patients with rheumatoid arthritis patients and secondary Sjogren syndrome

SUBJECTS AND METHODS
Study design and subjects:

This cross sectional study was conducted in the inpatient and outpatient clinics of Rheumatology and Rehabilitation Department , Faculty of Medicine, Zagazig University Hospitals. All patients were fulfill the following:

❖ Inclusion criteria

All patients were diagnosed as R.A according to ACR/Eular criteria 2010 **[6]** , and fulfil Eular criteria (2016) of Sjogren syndrome **[7]**

❖ Exclusion criteria:

Patients with Past head and neck radiation treatment, Hepatitis C infection , Acquired immunodeficiency syndrome (AIDS), Pre-existing lymphoma, Sarcoidosis ,Current use of anticholinergic drug.

• All patients included were subjected to clinical assessment in the form of : ,unstimulated whole salivary flow rate(USWSFR) , shrimers test , rheumatoid arthritis disease acrivity (DAS28).

• Laboratory evaluation in the form of: CBC, ESR, CRP, RF ,Anti CCP

• ultrasonograhic assessment of salivary glands , ultrasound images were acquired in the supine position with the neck hyperextended and the head slightly turned to

the side opposite the glands being examined. Both bilateral parotid and submandibular glands of each patient were scanned in 2 planes, parallel and perpendicular to the submandibular plane.. Axial and coronal views of the parotid and submandibular glands were obtained.

Written informed consent was obtained from all participants and the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

STATISTICAL METHODS

Data collected throughout history, basic clinical examination, laboratory investigations and outcome measures coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) **(Statistical Package for the Social Sciences)** software for analysis.

RESULTS

Sexty eight patients were included in our study ,most of them were female 88.3% .The disease duration was 9.31±2.4 **.** the median value for disease activity (DAS28) was 2.5(mild disease activity),the ESR median value was 30 .RF median value was 16. CRP median value was 18 , Anti CCP median value was 19.5 **[table1]**

Ultrasonographic features of salivary glands in patients with rheumatoid arthritis and secondary sjogren syndrome shows **hypoechoic areas** in (67.6%) of right parotid gland ,and (47%) of left parotid gland , (48.5%)of right submandibular gland, (44%) left submandibular gland . (88.2%) of right parotid gland showed **heterogenic areas** ,and (82.3%) of left parotid gland , (41.1%) of right submandibular gland, (73.5%) of left submandibular gland. **Hyperechoic bands** were detected in (80.8%) of right parotid gland ,and (85.2%) of left parotid gland , (42.6%) of right submandibular gland, (48.5%)of left submandibular gland. **fatty infiltration** were noticed in (10.2%) of right

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**Table 1: Demographic data of the patients with rheumatoid arthritis and secondary sjogren syndrome**

Variable	Rheumatoid with secondary Sjogren syndrome N=68
Female (No./ %)	60 – (88.3%)
Male(No./ %)	8- (11.7%)
Duration (years) Mean ± SD	9.31±2.4
CDAI Median Range	30 13-49
DAS28 Median Range	2.5 2-4.5
ESR Median Range	30 17-92
RF Median Range	16 8-100
Anti CCP Median Range	19.5 7-50
CRP Median Range	18 2.17-19

Table 2 :Ultrasonographic features of salivary glands in patients with rheumatoid arthritis and secondary sjogren syndrome

|		Right parotid	Left parotid	Right submandibular	Left submandibular
city hoic oic	Echogeni Normoec Hypoech	22 –(32.%) 46- (67.6%)	21- (30.8%) 47 –(69.1%)	35 –(51.4%) 33 - (48.5%)	38 – (55.8%) 30 – (44.1%)
etity ic nic	Homogen Homogen Heteroge	8- (11.7 %) 60 – (88.2%)	12 – (17.6%) 56- (82.3%)	40 – (58.8%) 28 – (41.1%)	36 – (52.9%) 50- (73.5%)
oic bands	Hyperech	50 – (80 .8%)	58 – (85.2%)	29 – (42. 6%)	33- (48.5%)
unfiltration	Fatty	7 – (10.2%)	8- (11.7%)	14 – (20.5%)	27 – (39 .7%)
ions	Calcificat	3 – (4.4%)	6 – (8.8%)	3 –(4.4 %)	2 –(2.9%)
border visibility	Posterior	39- (57.3%)	33 - (48.5%)	61 – (89 .7%)	60 – (88.2%)

Fig1:longitudinal scan of left parotid gland in comparison with thyroid gland shows hyperechoic bands ,hypoechoic nodules, and heterogenic appearance
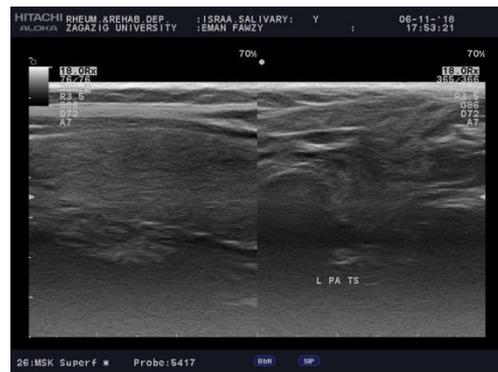
Fig2: left parotid glandin transverse scan in comparison with thyroid gland shows hyperechoic bands .
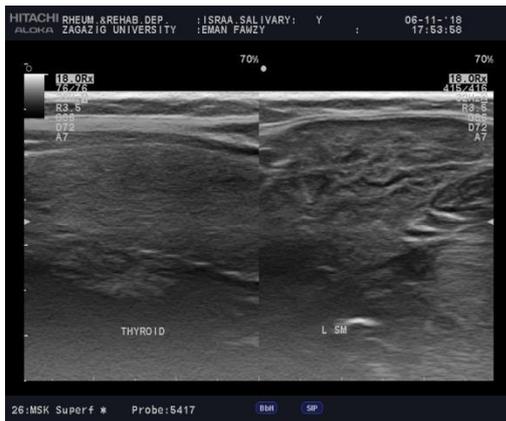
Fig3: left submandibular gland in comparison with thyroid gland shows hyperechoic bands and heterogenic appearance
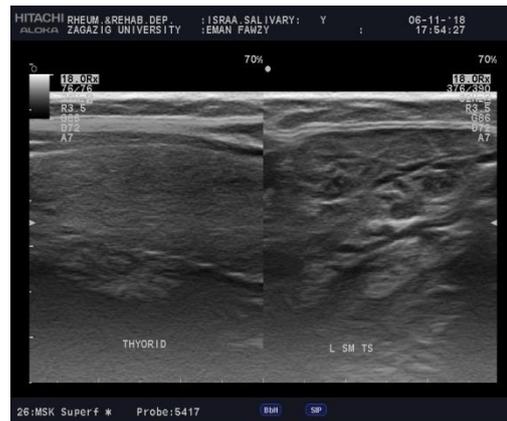
Fig4: transverse scan of left submandibular gland in comparison with thyroid gland shows hyperechoic bands ,hypoechoic areas , and heterogenic appearance

DISCUSSION

Sjogren's syndrome (SS) is a systemic autoimmune disease associated by especially salivary and lacrimal exocrine gland lymphocytic infiltrations arising in clinical signs; keratoconjunctivitis sicca and xerostomia or sicca complex.**[8]**

Secondary Sjogren's syndrome (SSS) is associated with other autoimmune diseases such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA)systemic inflammatory myositis or sclerosis (SSc).**[9]**

This study demonstrated that abnormal ultrasonographic features in salivary glands were common in patients with secondary sjogren syndrome,with heterogenecity and hyperechoic bands were the most common abnormal detected features .This was in agreement with Investigations done by **mossel et al. [10]** suggested the evaluation of parenchymal echogenicity, homogeneity, hypoechogenic areas, hyperechogenic reflections, and salivary gland posterior border , in either the right or left parotid and submandibular glands, to be sufficient to predict the ACR-EULAR classification , and detect ultrasonographic abnormal features of salivary glands

Our results showed that parotid glands were more affected than submandibular glands as detected by ultrasonography .this was in agreement with **Jonsson et al [11]** study which performed parotid gland

ultrasonography in 62 patients with Sjögren's syndrome (SS) and in 69 controls of similar age and sex distribution. Different degrees (mild, evident or gross) of parenchyma inhomogeneity (PIH) of parotid gland were the most important sonographic changes in SS; they occurred in 83.9% of the patients.

In our study ultrasonographic features of salivary glands were not correlated with disease activity of rheumatoid arthritis ,this was in agreement with **Nieto-gonza [12]** who conducted a transverse observational single center study I Madrid of spain verified that Pathological SGU findings might not be associated with the disease activity.

CONCLUSION

Musculoskeletal Ultrasonography is a very helpful tool in detection of salivary gland ultrasonographic abnormalities at patients with rheumatoid arthritis and Sjogren Syndrome.

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