Research Article

Anti CCP and Anti MCV Antibodies are Marker of Arthritis in Systemic Lupus Erythematosus and Scleroderma

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Abstract

Aim of the work: To detect the presence of Anti-Cyclic-Citrullinated Peptide Antibodies (anti CCP Ab) and Anti-Modified Citrullinated Vimentin Antibodies (anti MCV Ab) in Systemic Lupus Erythematosus (SLE) and Systemic Sclerosis (SSc) patients and their correlation to radiological findings and disease activity.

Methods: This study was included 70 SLE patients and 30 SSc patients diagnosed according to ACR classification criteria. After informed consent, all patients were subjected to detailed history taking, full clinical examination including rheumatological examination, laboratory investigations: included CBC, ESR, CRP with titer, urine analysis, renal and liver function, serum uric acid, ANA, Anti dsDNA antibodies by Indirect Immunofluorescence Method (IIF), Anti Scl 70 antibody, Anti CCP and Anti MCV antibodies done by ELISA. X- Ray and U/S on both hands and knees and disease activity score using SLEDAI score for SLE patients and Medsgar score for SSc patients.

Results: In this study, anti CCP Ab were found in 8 (11.4%) of SLE patients and 4 (13.3%) SSc patients, while anti MCV Ab were found in 14 (20%) SLE patients and 8 (26.7%) of SSc patients. There is association between presence of anti CCP Ab and anti MCV Ab and a clinically evident arthritis in both SLE and SSc. Strong relationship between high CRP level and a severe arthritis and joint erosions was noticed in SLE patients. A significant radiological evident erosive arthritis in the form of synovial hypertrophy and bony erosions were found using ultrasonography and plain X-ray with seropositive anti CCP and anti MCV Ab in both SLE and SSc patients. In our study, cut off value of anti CCP which was >12, with sensitivity of 70.42% and specificity of 60%and best cut off value of Anti MCV which was >11, with sensitivity of 98.46% and specificity of 30% in SLE and SSc.

Conclusion: There is a significant association between presence of anti CCP Ab and anti MCV Ab and the presence of clinically and radiologicaly evident erosive arthritis assessed by x-ray and U/S in both SLE and SSc patients.

Introduction

Anti-Citrullinated Protein Antibodies (ACPA) has been reported as more specific serological markers of Rheumatoid Arthritis (RA). They provide a superior alternative to the Rheumatoid Factor (RF) test in laboratory diagnostics of RA [1]. Different studies suggest that the enzymatic citrullination and the production of ACPAs may also be associated with other inflammatory arthritis-associated autoimmune diseases [2].

In SLE, arthritis is one of the most common symptoms seen in 60-90% of patients. In the majority of cases arthritis is non deforming and non-erosive and thus will not directly cause irreversible functional impairment, the presence of anti CCP was strongly associated with erosive arthritis [3].

In SSc, polyarthritis have varied between 36-80%. Erosive arthritis has been reported throughout the Metacarpophalangeal (MCP), Proximal Interphalangeal (PIP), and Distal Interphalangeal (DIP) joints, as well as the wrist. Indeed, at 7 years of SSc, bony erosions (mostly in the hands) have been noted in 4-57% of patients [4].

Patients and Methods

Patients

This is across sectional study which included 70 SLE patients selected according to ACR classification criteria [5] and 30 SSc patients selected according to ACR classification criteria SSc [6]. All patients were recruited randomly by simple sampling method from rheumatology and internal medicine outpatient clinics and inpatient departments at Ain Shams University hospitals, Egypt.

Ethical considerations: The nature of the present study was explained to all participants. The laboratory and radiological procedures represent standard care with no ethical conflicts. Consent was obtained from all participants.

Methods

All subjects included in this study were subjected to the following: Detailed history taking with special emphasis on: age, sex, disease duration, drugs intake and musculoskeletal affection, full clinical examination including rheumatological examination. Laboratory investigations: Complete blood picture, performed on 5 part differential automated cell counter coulter® LH 750 cell counter (Coulter Corporation, Florida, USA). Measurement of the level of C - Reactive Protein Extended Range (RCRP), it was performed on dimension® clinical chemistry system (Siemens health care diagnostic products Gmbh, Malburg/ Germany) using Flex® reagent cartilage. It is a quantitative determination of CRP in human serum and plasma, based on particle enhanced turbidimetric immunoassay technique. The cut off value for RF is 3.0 mg/L. Erythrocyte Sedimentation Rate (ESR), performed by using "ALS – 20" Automatic Sedimentation Rate Analyzer (ALARİS MEDİKAL ve ELEKTRONİK SİSTEMLER SAN.TİC., ÇamdibiBornova /İZMİR / TÜRKİYE). Liver Function tests (Liver enzyme (AST\ALT) - Serum albumin- Total protein) and renal function tests (serum creatinine, blood urea and serum uric acid measurement), done by Synchron CX-9 autoanalyzer, Beckman Instruments., Inc., Fullerton, California USA. Routine urine analysis [7], ANA and Anti-Double Stranded DNA (anti dsDNA) by Indirect Immunofluorescence Method (IIF), auto antibodies were measured by incubation of patients' sera on the tissue substrate to allow binding of antibodies to the substrate. Any antibodies not bound are removed by rinsing the slide. Bound antibodies of the IgG class are detected by incubation of the substrate with fluorescence-labeled antihuman IgG conjugate. Reactions are observed under a fluorescence microscope equipped with appropriate filters. The presence of ANA and anti dsDNA is demonstrated by an apple green fluorescence of specific histological structures in the tissue (ANA pattern). The titre is then determined by testing serial dilutions. Serum antibodies measured by ELISA method, Anti Scl 70 antibodies by ELISA kit (MyBiosource, Inc., California USA) when indicated for SSc diagnosis, anti CCP by (DIASTAT, Axis-Shield Diagnostics Limited, UK) ELISA Kit and anti MCV antibodies measured by (OrgentecDiagnostika GmbH, Mainz, Germany) according to manufacturer's instructions with the recommended cut-off value of 1 U/L for anti Scl 70 and 20 U/L for both anti CCP and anti MCV.

Statistical analysis: Data were analyzed using SPSS (version 20) statistical software package under Windows 7 operating system for IBM compatible PC. The statistical tests used were as follow: The mean, standard deviation, for categorized parametric data. Student's t-test: was used for comparison of quantitative data, while Chi-Square test (X^2) was used for comparison of qualitative data. ROC curve was done to determine the best cut off value of the marker to determine the highest value of sensitivity and specificity on this point. The level of significance was ≤ 0.05.

Radiological methods: All the patients were subjected to plain X-ray posterior-anterior view for both hands and knees and numerical counting of number of erosions was done and ultrasonographic imaging of both hands and knees including assessing erosions, synovial hypertrophy and active inflammatory signs with blood flow Doppler [8].

Disease activity assessment: SLE disease activity was assessed by Systemic Lupus Erythematosus Disease Activity Index (SLEDAI),

patients with SLEDAI score less than 6 considered clinically inactive, patients with score 6-11 considered to have mild to moderate disease activity while patients with score 12 or more were considered to have severe disease activity [9].

SSc disease activity disease severity scale for SSc recently has been developed and internally tested. The authors identified nine organ systems and identified variables for each one which could be used for defining severity [10].

Results

Demographic data of SLE patients

The study was carried on 62 female patients and 8 male SLE patients, their age ranged from 18 to 49 years with mean 29.14±6.41 years. The disease duration ranged from 3 months to 10 years with mean 2.48±2.24 years with cumulative dose of steroid in gram ranged from 1 to13 gram with mean 7.91±3.79 gram and 39 (55.71%) of patient receiving cyclophosphamide.

Demographic data of SSc patients

The study was carried on 30 female patients, their age ranged from 18 to 63 years with mean 40.1±12.5 years. Their disease duration ranged from 2-20 years with mean 5.3±3.4 years. The disease activity index ranged from 3-9 with mean 5.33±1.83. 8 (26.7%) patients received cycle of Cyclophosphamide and 30 (100%) patients received steroids and Ca channel blocker while 13 (43.3%) patients were on prokinetics.

Clinical manifestations

The most prevalent symptoms in SLE patients were nephritis as 62 (88.57%) SLE patients, 53 (75.71%) patients have malar rash, 44 (76.86%) patients have arthritis, 43 (61.4%) patients have anaemia and 36 (51.4%) patients have photosensitivity. As regard SSc, all patient had skin tightness (100%) at time of examination, 28 (93.33%) patients had Raynaud's phenomena, 11(36.7%) patients had arthritis,10 (33.33%) patients had GIT affection, 7 (23.33%) patients had pulmonary affection, 2 (6.67%) patients had telangiectasia, calcinosis and neurological affection, 1(3.33%) patient had cardiac affection, but no patients with renal affection.

In this study, the incidence of anti CCP and anti MCV among SLE patients and SSc patients; anti CCP Ab were found in 8 (11.4%) of SLE patients and 4 (13.3%) SSc patients, while anti MCV Ab were found in 14 (20%) SLE patients and 8 (26.7%) of SSc patients as seen in table 1.

Table 1: Incidence of anti CCP and anti MCV among SLE patients and SSc patients.

SLEpatients	Positive	Negative
ANTI-CCP	8 (11.4%)	62 (88.6%)
ANTI-MCV	14 (20%)	56 (80%)
SSc patients		
ANTI-CCP	4 (13.3%)	26 (86.7%)
ANTI-MCV	8 (26.7%)	22 (73.3%)

Table 2: Relation between Anti CCP and Anti MCV antibodies and different clinically evident arthritis in both SLE and SSc patients.

Type of disease	SLE				SSc			
	Anti CCP				Anti CCP			
Clinical data	Positive (8)	Negative -62	x2/t*	p-value	Positive (n=4)	Negative (n=26)	x2/t*	p-value
No of patients with swollen joints	8 (100%)	30 (48.39%)	7.83	**0.005**	3 (75%)	6 (23.8%)	4.451	**0.035**
No of swollen joints/patient (Range)	3-Feb	2-Jan	18.111	**<0.001**	5-Mar	0-1	8.685	**0.034**
No of patients with tender joints	8 (100%)	36 (58.06%)	5.532	**0.019**	3 (75%)	8 (30.77%)	2.921	0.087
No of tender joints/patient (Range)	3-Feb	4-Mar	37.321	**<0.001**	15-16	0-1	11	**0.027**
No of patients with morning stiffness	8 (100%)	19 (30.65%)	14.693	**<0.001**	2 (50%)	1 (3.85%)	8.205	**0.004**
	Anti MCV				Anti MCV			
	Positive (14)	Negative -56	x2/t*	p-value	Positive (n=8)	Negative (n=22)	x2/t*	p-value
No of patients with swollen joints	11 (78.57%)	27 (48.21%)	4.399	**0.036**	5 (62.5%)	4 (18.2%)	5.487	**0.019**
No of swollen joints/patient (Range)	3-Feb	2-Jan	35.912	**<0.001**	3-Feb	0-1	6.523	**0.011**
No of patients with tender joints	11 (78.57%)	33 (58.93%)	2.039	0.153	5 (62.5%)	6 (27.27%)	3.135	0.077
No of tender joints/patient (Range)	5-Apr	4-Mar	54.699	**<0.001**	10-Sep	0-1	27.681	**<0.001**
No of patients with morning stiffness	10 (71.43%)	17 (30.36%)	8.255	**0.004**	3 (37.5%)	0 (0%)	9.167	**0.002**

There is a statistically significant difference between both anti CCP Ab and anti MCV Ab positive and negative SLE and SSc patients as regard clinically evident arthritis (number of swollen, tender joints and the presence of morning stiffness) (p value <0.05) as seen in table 2.

As regard different laboratory data, Disease Activity Index in SLE (SLEDAI score) ranged from 2-28 with statistically significant difference between positive anti CCP Ab and anti MCV Ab and CRP in SLE patients (p value <0.05). But in SSc patients there was no statistically significant difference between positive anti CCP and anti MCV as regard CRP (p value >0.05) as seen in table 3. Other studied laboratory parameters shows no statistically significant difference (p value >0.05).

As regard radiological finding there were a statistically significant difference between anti CCP Ab and anti MCV Ab positive and negative in SLE and SSc patients as regard the presence of erosions either by U/S or X-ray and the presence of synovial hypertrophy by U/S (p value <0.05). But as regard synovitis by blood flow doppler there was a statistically significant difference between Anti CCP Ab and Anti MCV Ab positive and negative in SSc patients only (p value <0.05) as seen in table 4.

Disease Activity Index in SLE (SLEDAI score) ranged from 2-28 with no statistically significant with either anti CCP and anti MCV positive and negative patients (p value >0.05) while SSc disease activity index ranged from 3-9 and it is statistically significant with anti CCP positive antibodies (p value <0.05) while highly statistical significant with anti MCV positive antibodies (p value <0.01) as seen in table 5.

Receiver Operating Characteristics (ROC) curve was used to define the best cut off value of anti CCP which was >12 and cut off value of anti MCV which was >11 (Figure 1 and 2).

Table 3: Relation between Anti CCP and Anti MCV antibodies and laboratory markers of arthritis in both SLE and SSc patients.

Type of disease	SLE				SSc			
	Anti CCP				Anti CCP			
	Positive (8)	Negative -62	x2/t*	p-value	Positive (n=4)	Negative (n=26)	x2/t*	p-value
ESR	56.50±29.55	51.38±32.01	0.429	0.669	78.75±29.55	59.58±23.96	2.103	0.158
CRP	0 (0%)	18 (29.03%)	3.094	**0.046**	4 (100%)	16 (61.5%)	2.308	0.129
	Anti MCV				Anti MCV			
	Positive (14)	Negative -56	x2/t*	p-value	Positive (n=8)	Negative (n=22)	x2/t*	p-value
ESR	50.64±24.44	52.28±33.28	0.173	0.863	68.00±29.60	60.00±23.64	0.767	0.449
CRP	2 (14.29%)	17 (30.36%)	3.81	**0.05**	6 (75%)	14 (63.6%)	0.341	0.559

Table 4: Relation between Anti CCP and Anti MCV antibodies and different radiological evident of arthritis in both SLE and SSc patients.

Type of disease	SLE				SSc			
	Anti CCP				Anti CCP			
	Positive (8)	Negative -62	x2/t*	P-value	Positive (n=4)	Negative (n=26)	x2/t*	P-value
Hand U/S								
No. of patients with U/S erosions	7 (87.5%)	3 (4.84%)	40.158	**<0.001**	3 (75%)	0 (0%)	21.667	**<0.001**
No. of erosions/patient (Range)	3-Feb	0-1	7.514	**<0.001**	2-Jan	0	6.4	**0.011**
No. of patients with synovial hypertrophy by U/S	8 (100%)	33 (53.23%)	6.597	**0.01**	3 (75%)	9(34.62%)	2.356	0.125
No. of joints with synovial hypertrophy/patient (Range)	3-Feb	2-Jan	8.913	**<0.001**	2-Jan	0-1	0.151	0.881
U/S with increased doppler flow (synovitis)	1 (12.5%)	4 (4.84%)	0.41	0.522	1 (25%)	0 (0%)	6.724	**0.01**
U/S knee osteoarthritis	4 (50%)	26 (41.94%)	0.222	0.638	2 (50%)	9 (34.62%)	0.353	0.552
No. of patients with synovitis	2 (50%)	2 (3.23%)	0	1	1 (25%)	0 (0%)	6.724	**0.01**
X-ray finding								
Hand x-ray: No. of patients with joint Erosions	4 (50%)	1(20%)	18.287	**<0.001**	2 (50%)	0 (0%)	13.929	**<0.001**
No. of eroded joints /patient (Range)	0-1	0-1	1.643	0.2	0-1	0	13.929	**<0.001**
Knee x-ray: osteoarthritis	4 (50%)	22 (35.4%)	1.976	0.577	2 (50%)	9 (34.6%)	4.455	**0.035**
	Anti MCV				Anti MCV			
	Positive (14)	Negative -56	x2/t*	p-value	Positive (n=8)	Negative (n=22)	x2/t*	p-value
Hand U/S								
No. of patients with U/S erosions	7 -50%	3 (5.36%)	18.589	**<0.001**	3 (37.5%)	0 (0%)	9.167	**0.002**
No. of erosions/patient (Range)	2-Jan	0-1	4.967	**0.045**	0-1	0	16.5	**0.004**
No. of patients with synovial hypertrophy by U/S	10 (71.4%)	31 (55.36%)	1.338	0.247	6 (75%)	6 (27.3%)	5.568	**0.018**
No. of joints with synovial hypertrophy/patient (Range)	5-Apr	0-1	18.775	**<0.001**	2-Jan	0-1	1.324	0.25
U/S with increased doppler flow (synovitis)	2 (14.29%)	3 (5.36%)	1.398	0.237	1 (12.5%)	0 (0%)	2.845	0.092
U/S knee osteoarthritis	7	23	0.429	0.513	4 (50%)	7 (31.82%)	0.835	0.361
No. of patients with synovitis	1 (7.14%)	3 (5.3%)	0.144	0.704	1 (12.5%)	0 (0%)	6.724	**0.01**
X-ray finding								
Hand x-ray: No. of patients with joint Erosions	2 (14.2%)	3 (5.3%)	0.353	0.563	2 (25%)	0 (0%)	5.893	**0.015**
No. of Eroded joints /patient (Range)	0-1	0-1	0.141	0.707	0-1	0	2.845	0.092
X- ray knee osteoarthritis	4 (28.5%)	22 (39.2%)	0.169	0.682	4 (50%)	7 (31.8%)	0.835	0.361

Table 5: Diagnostic Performance of Anti CCP and Anti MCV antibodies in Discrimination of SLE and SSc.

	Cut-off	Sensitivity	Specificity	PPV	NPV	Accuracy
Anti CCP	>12	70.42	60	80.6	46.2	61.70%
Anti MCV	>11	98.46	30	75.3	90	60.2

Figure 2: Cut off value of anti MCV which was >11.
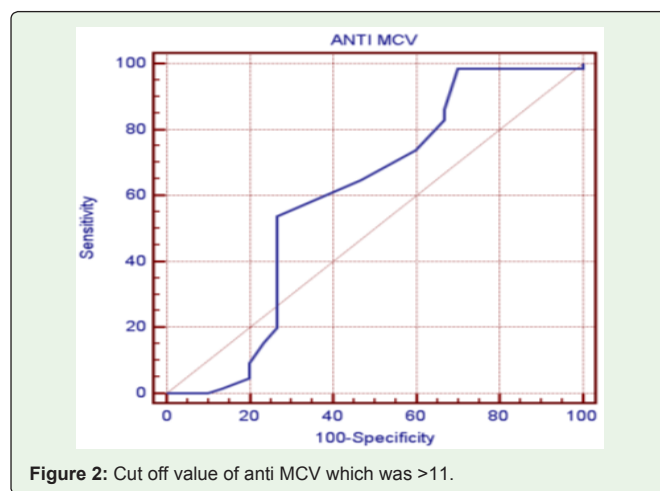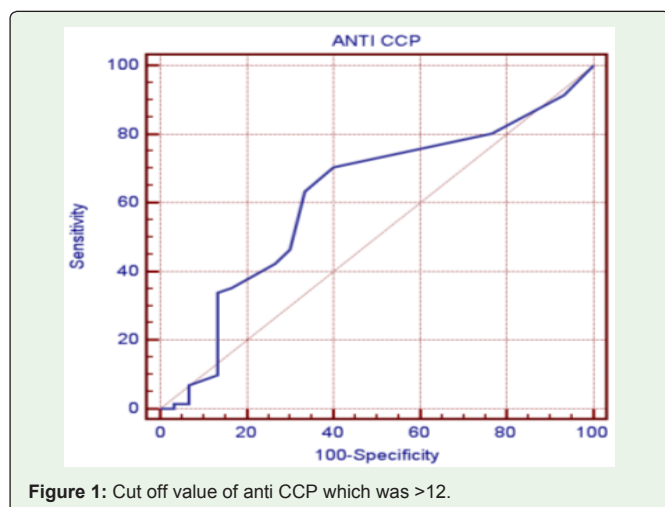
Discussion

Anti CCP Ab are highly specific serological markers for RA that is thought to be directly involved in the disease pathogenesis. Assays for the detection of anti CCP Ab have become popular in the last years for diagnosis of RA, in accordance with the 2010 RA classification criteria, ACPA detection is now used as a means of diagnosing RA

Figure 1: Cut off value of anti ccp which was >12.

[11]. Citrullinated proteins are not exclusively found in RA patients, but can also be present in patients with other inflammatory joint diseases [12].

In this study anti CCP Ab were found in 8 (11.4%) of SLE patients, while anti MCV Ab were found in 14 (20%) of SLE patients. The anti CCP Ab prevalence among SLE patients in previous different studies was extremely variable. As the prevalence among different studies, ranging from 6.7 % to 37.93 % .In Romanian study it was 6.7% [13], in Brazalian study was 13.7% [14], in Chinese study was 13.8% [15], in Egyptian study was 28% [16], in another Chinese study was 37.93% [17]. In Contrast to Damián-Abrego et al. [18] who studied 34 SLE patients reported that SLE patients, with or without deforming arthropathy, had normal serum anti CCP Ab concentrations. The cause of this variability may be due to the different ethnicities, also the variability between the SLE patients in the different studies should be considered. Although Iaccarino et al. [19] estimated that the prevalence of ACPA in SLE patients with arthritis was around 57-100% and considering them as having "rhupus" (SLE-RA overlap syndrome) supporting the concept that rhupus represents the coexistence of two separated diseases in the same patient, rather than an additional disease entity.

But as regard anti MCV Ab in SLE our results were close to the results of Egerer et al., [20] who reported that anti MCV antibody was detected in many rheumatic diseases and was found positive in 14% of SLE patients. Lower results were reported by Putterman et al. [21]. Poulsom and Charles [22] studied different autoantibodies in SLE they had found that 2%of the studied patients had positive anti MCV Ab, this was similar to the results of Kalunian1 et al. [23] who studied the level of anti MCV Ab in 210 lupus patients he only found positive anti MCV Ab in 1.9%.

As regard SSc 4 patients (13.3%) had positive anti CCP Ab and 8 patients (26.7%) had positive anti MCV Ab. The anti CCP Ab prevalence among SSc patients in previous different studies was extremely variable ranging from 2.6% to 20.5%. In study done by Morita et al. it was 2.6% [24], Xia et al., study was 10% [1], in gegnoli et al. study was 10.6% [25], Payet et al. study was 10.8% [26] and in study of Polimeni et al. was 20.5% [27]. On other hand Gaddy et al. [28] who studied the level of different auto antibodies in patients with rheumatic disease among Oklahoma tribal populations anti CCP Ab were not detectable. But as regard anti MCV Ab in SSc patients Poulsom and Charles [22] found that only 2% scleroderma patients had positive anti MCV Ab.

As regard studying musculoskeletal and joint affection in SLE patients our results were agreed with Habeeb et al. [16] who found that arthritis in the form of joint tenderness and swelling were found in 60% of the studied patients and anti CCP Ab positive patients exhibited a significant higher occurrence of arthritis in comparison to negative patients. We also agreed with Popescu et al. [13] who found that 80% of anti CCP lupus patients had arthritis. Martinez ' study [29] had detected a similar results, in his a retrospective medical record review of a case series of five female patients with SLE and erosive arthropathy anti CCP Ab detected in 4 out of 5 (80%) patients, they concluded that erosive arthritis was strongly associated with the presence of anti CCP Ab. Also Amezcua-Guerra et al. [30] detected association of anti CCP Ab with erosive arthritis in SLE patients and concluded that high levels of anti CCP Ab may be a useful serological

marker for an erosive arthritis pattern among these patients; also Tarabore et al. [31] reported that patients with SLE and positive anti CCP Ab have more erosive arthritis than patients without anti CCP Ab. Although, one study did report that even though the prevalence of anti CCP was higher in SLE patients in comparison to control yet no relationship could be found with clinical profile including joint complaints which done by Skare et al. [20] and another study done by Galvão et al. [32] also found no difference between the patients with or without arthritis. Studying the clinical manifestations of SLE patients with positive anti MCV Ab had significantly more number of swollen joints, tender joints and more patients with morning stiffness than those with negative anti MCV Ab. This is in concordance with Hussain and Jaffery [33] that studied the association of anti MCV Ab with SLE overlapping with various syndromes and found that SLE patients with erosive arthropathy showed high level of anti MCV Ab.

Studying musculoskeletal affection among anti CCP Ab in SSc patients; our results were close to Atzeni et al., [34] who showed that the frequency of arthritis was higher in patients with SSc with anti CCP Ab than in patients with SSc without anti CCP Ab. On the other hand Morita et al. [24] found that SSc patients with elevated serum levels of anti CCP Ab exhibited arthralgias and interstitial pneumonia. In contrast to Payet et al. [26] and Gottenberg et al. [35] who found no significant correlation between anti CCP Ab and any clinical symptoms? Habeeb et al. [16] found that anti CCP Ab positive patients exhibited significant difference in comparison to negative patients as regard arthritis (79 vs. 52%) and the presence of erosions (28 vs. 5%) and presence of high CRP (78 vs. 30%). As well as anti MCV Ab positive SSc patients in our results were in agreement with Xia et al. [1] who found significant association between anti MCV Ab with arthritis.

Concerning the laboratory findings there were statistical significant correlation between anti CCP Ab positive SLE patients with high CRP level that was in agreement with Habeeb et al. [16] and Zhao et al. [15] who demonstrated that anti CCP Ab positive patients with SLE show higher CRP and RF positivity than those with negative anti CCP Ab. Interestingly, since CRP does not usually increase with disease activity in SLE, in contrast to the majority of inflammatory diseases, an increase in CRP could help to distinguish SLE patients with or without classic articular involvement. This simple marker in SLE patients with articular involvement could be a warning signal of worse articular evolution. Also, that findings are supported by the results of Taraborelli et al. [31], as they found that RF positivity and increased CRP were more frequent in erosive arthritis than in non-erosive arthritis and reported that increase in RF and CRP could be an additional means of identifying lupus patients with arthritis at risk of a worse prognosis. On the contrary, Popscu et al. [13] found no statistical significant difference between anti CCP Ab positive and anti CCP Ab negative patients with CRP. Unlike SLE, among SSc patients, with positive anti CCP Ab and anti MCV Ab, joint erosions showed no association with CRP level or other laboratory parameters as up till now no available studies in this issue.

Our results revealed a significant radiological evident erosive arthritis in the form of synovial hypertrophy and bony erosions were found using ultrasonography and plain X-ray with seropositive anti CCP Ab and anti MCV Ab in both SLE and SSc patients, previous studies had detected similar results, as Amezcua et al., [30] who concluded that anti CCP Ab with radiological evident joint erosions

in SLE patients was 60 % and the high levels of anti CCP may be a useful serological marker for radiological evidence of erosive arthritis pattern among these patients. In addition to Zhao et al. [15] who found that the frequency of arthritis in anti CCP Ab positive SLE patients (73.7%) was significantly higher than in anti CCP Ab negative patients (47.1%, P = 0.031), they also noticed significantly higher incidence of x-ray proven erosive arthritis among their anti CCP Ab positive SLE patients with arthritis than in anti CCP Ab negative patients with arthritis.

Similarly, SSc, anti CCP Ab positivity was associated with more radiologically evident joint erosions that results were in agreement with Avouac et al. [36] and Atzeni, et al. [34] whom showed that 23% of patients with SSc with positive anti CCP Ab had radiological evidence of erosive arthritis. In contrast, Payet et al. [26] and Gottenberg et al. [35] studies which reported that no statistical significant between SSc patients with positive anti CCP Ab and radiological evidence of erosive arthritis. Positive anti MCV Ab had significantly number of U/S and X-ray evident erosions and synovial hypertrophy similarly Xia et al., [1] reported that presence of anti MCV Ab had been associated with more joint erosions in x-rays.

As regard Sensitivity and specificity of Anti CCP Ab which is an antibody directed against a variety of citrullinated proteins, has been considered a useful tool in RA diagnosis and prognosis. Among the different autoantibodies described in RA patients, anti CCP Ab displays the strongest specificity 95-98% with 70-80% sensitivity [37]. Variable results were found in other studies Budhram, et al. [38] found that SLE sensitivity of anti CCP Ab was 47.8% while specificity was 91.8%. Also Díaz-Toscano et al. [39] studied anti CCP Ab and anti-MCV Ab in RA in relation to other chronic inflammatory rheumatic diseases mainly SLE and SSc and reported that sensitivity 85 %, specificity 92 %, positive predictive value 94 % and negative predictive value79 %. While Morita et al. [24] who studied SSc –RA overlap for anti CCP Ab sensitivity 86 %, specificity 97%, positive predictive value 67% and negative predictive value 99%.

Conclusion

There is a significant association between presence of anti CCP Ab and anti MCV Ab and the presence of clinically and radiologicaly evident erosive arthritis assessed by x-ray and U/S in both SLE and SSc patients.

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