

ULTRASOUND EVALUATION OF THE ANKLE JOINTS AND TENDONS IN SYSTEMIC LUPUS ERYTHEMATOSUS

ULTRAZVUČNA EVALUACIJA ZGLOBOVA I TETIVA GLEŽNJA U SUSTAVNOM ERITEMSKOM LUPUSU

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ABSTRACT

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease with musculoskeletal involvement as one of the most common clinical manifestations. High-resolution ultrasound (US) has been proven to be a useful diagnostic tool for the evaluation of joints and tendons in the majority of inflammatory rheumatic diseases.

The aim of this study is to assess the frequency of ankle joint and tendon involvement in SLE patients with the use of US, and correlate the findings with the physical examination, laboratory tests, and disease activity scores. Here we will show preliminary results of the survey in the first 10 out of 60 included patients. Ten consecutive SLE patients were enrolled in the study and underwent clinical evaluation, laboratory tests, and bilateral high-resolution US on the same day.

Gray-scale and power Doppler (PD) US were performed for imaging of the talocrural (TC) and subtalar joints (ST), ankle tendons, second and third metacarpophalangeal (MCP) joints, second and third proximal interphalangeal (PIP) joints, second and third metatarsophalangeal (MTP) joints, and wrists.

A total of 180 joints and 200 tendons were examined. Preliminary results showed US-detected inflammatory joint abnormalities in 7/10 (70%) patients and tendon involvement in 1/10 (10%). Both the MTP and TC joints were affected in 60% of the patients, MCP joints in 50%, ST in 40%, wrists in 30%, and PIP joints in 10% of the patients. The most prevalent pathological US finding was joint effusion, less frequently synovial hypertrophy, while a positive PD signal was rarely detected. Effusion in the TC joints was present in 60% of the patients, synovial hypertrophy in 40%, and a positive PD in 10%. As many as 62.5% of the patients without inflammatory joint symptoms had pathological US findings in the ankle joints.

The results showed a high prevalence of US-verified inflammatory joint changes in SLE patients. Surprisingly, the MTP and ankle joints were most commonly affected. Additionally, a great number of asymptomatic patients also had pathological US findings in the ankle joints.

KEYWORDS: Lupus erythematosus, systemic – complications; Ankle joint – diagnostic imaging; Joint diseases – diagnostic imaging, etiology; Synovitis – diagnostic imaging, etiology; Tenosynovitis – diagnostic imaging, etiology; Metacarpophalangeal joint – diagnostic imaging; Metatarsophalangeal joint – diagnostic imaging; Ultrasonography

SAŽETAK

Sustavni eritemski lupus (SLE) kronična je autoimunosna bolest s afekcijom muskuloskeletnog sustava kao jednom od najčešćih manifestacija. Ultrazvuk visoke rezolucije (UZ) dokazao se kao korisno dijagnostičko sredstvo pri evaluaciji zglobnih i tetivnih promjena u većini upalnih reumatskih bolesti.

Cilj je ove studije odrediti učestalost zahvaćanja zglobova i tetiva gležnja u bolesnika sa SLE-om koristeći se UZ-om te korelirati rezultate s fizikalnim pregledom, laboratorijskim nalazima i mjerama aktivnosti bolesti. Prikazali smo preliminarne rezultate studije na prvih 10 od ukupno 60 bolesnika. Uključeno je 10 uzastopnih pacijenata sa SLE-om koji su istog dana podvrgnuti kliničkoj evaluaciji, laboratorijskom ispitivanju i ultrazvučnom pregledu. Ultrazvučno su obostrano pregledani talokruralni (TC) i suptalarni (ST) zglobovi, tetive gležnja, drugi i treći metakarpofalangealni (MCP) zglobovi, drugi i treći proksimalni interfalangealni (PIP) zglobovi, drugi i treći metatarzofalangealni (MTP) zglobovi te ručni zglobovi.

Ukupno je pregledano 180 zglobova i 200 tetiva. Preliminarni rezultati pokazuju ultrazvučno detektirane upalne zglobne promjene u 7/10 (70%) bolesnika i zahvaćenost tetiva u 1/10 (10%). MTP i TC zglobovi bili su zahvaćeni u 60% bolesnika, MCP zglobovi u njih 50%, ST u 40%, ručni zglobovi u 30%, dok su PIP zglobovi bili zahvaćeni u 10% bolesnika. Najčešći patološki ultrazvučni nalaz bio je zglobni izljev, nešto rjeđe sinovijalna hipertrofija, dok je pozitivan PD signal rijetko bio prisutan. Izljev u TC zglobovima detektiran je u 60% bolesnika, sinovijalna hipertrofija u njih 40%, a pozitivan PD u 10% bolesnika. Čak 62,5% asimptomatskih bolesnika imalo je patološki nalaz na UZ-u gležnjeva.

Rezultati pokazuju veliku prevalenciju ultrazvučno verificiranih upalnih promjena zglobova u pacijenata sa SLE-om. Iznenađuje da su najčešće bili zahvaćeni zglobovi stopala i gležnja. Također, bitno je naglasiti da je velik broj asimptomatskih bolesnika imao patološki ultrazvučni nalaz zglobova gležnja.

KLJUČNE RIJEČI: Sistemski eritemski lupus – komplikacije; Gležanjski zglob – dijagnostički slikovni prikaz; Zglobne bolesti – dijagnostički slikovni prikaz, etiologija; Sinovitis – dijagnostički slikovni prikaz, etiologija; Tenosinovitis – dijagnostički slikovni prikaz, etiologija; Metakarpofalangealni zglob – dijagnostički slikovni prikaz; Metatarzofalangealni zglob – dijagnostički slikovni prikaz; Ultrasonografija

INTRODUCTION

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease of complex pathogenesis with a wide range of clinical manifestations (1). It is characterized by multi-system inflammation with the production of autoantibodies and the formation of immune complexes and their deposition into tissues. Affection of the musculoskeletal system is one of the most common and earliest manifestations of the disease, occurring in 95% of patients (1, 2). The joint involvement may range from mild arthralgia and arthritis to a rare non-erosive deforming arthropathy (Jaccoud arthropathy) (1), and almost all joints can be affected. In older studies, the most commonly affected joints were the small joints of the hands, the wrist, and the knee, while recent studies point to the frequent involvement of the joints of the feet (3, 4). Periarticular structures may also be affected by inflammation. Tendinitis, tenosynovitis, and changes or ruptures of the tendons have also been described in SLE patients, sometimes being the only cause of pain and instability in these patients. Affection of the ankle often occurs in patients with inflammatory rheumatic diseases. Clinical examination of the ankle may underestimate the type and distribution of the pathological changes due to the complexity of the anatomical structures of that area. Conventional radiological examination of the ankle provides bone structure data while providing

UVOD

Sustavni eritemski lupus (SLE) kronična je autoimunosna bolest kompleksne patogeneze koja se manifestira širokim spektrom simptoma (1). Karakteriziraju je multiorganska upalna zbivanja uz proizvodnju protutijela i stvaranje imunokompleksa te odlaganje njihovih depozita u tkiva. Zahvaćanje muskuloskeletnog sustava među najčešćim je i najranijim manifestacijama, a javlja se u oko 95% slučajeva (1, 2). Zahvaćanje zglobova može varirati od blage artralgijske, preko artritisa, do rijetko prisutne neerozivne deformirajuće artropatije (takozvane Jaccoudove artropatije) (1), a mogu biti zahvaćeni gotovo svi zglobovi. Prema prijašnjim studijama, kao najčešće zahvaćeni zglobovi navode se mali zglobovi šaka, ručni zglobovi i koljena, dok novije studije upućuju i na čestu zahvaćenost zglobova stopala (3, 4). I periartikularne strukture mogu biti zahvaćene upalnim zbivanjem. Tendinitis, tenosinovitis i promjene ili rupture tetiva također su opisani kod pacijenata sa SLE-om, što katkad može biti jedini uzrok boli i nestabilnosti u ovih pacijenata. U pacijenata s upalnim reumatskim bolestima gležanj je često zahvaćen bolešću. Klinički pregled gležnja može podcijeniti tip i distribuciju patoloških promjena zbog kompleksnosti anatomskih struktura tog područja. Konvencionalni radiološki pregled gležnja donosi podatke o strukturi kosti, ali ne daje mnogo podataka o okolnom mekom tkivu. Magnetska rezonancija (MR) slikovna je metoda

very little information about the surrounding soft tissue. Magnetic resonance imaging (MRI) is a high-resolution imaging that can show both bone and soft tissue structures. It is very sensitive to changes in joints, but it is expensive and often unavailable in routine clinical practice.

High resolution Power Doppler (PD) and musculoskeletal ultrasound (MSUS) has been proven to be a useful and non-invasive diagnostic technique for assessing and tracking pathological changes in joints, tendons, and entheses (5). There is extensive literature on the benefits of MSUS in various inflammatory rheumatic diseases, mostly in rheumatoid arthritis, psoriatic arthritis, and other spondyloarthropathies (6, 7). However, so far few ultrasound studies have been conducted that evaluate the joints in SLE patients (4, 8, 9).

PATIENTS AND METHODS

The pilot study included 10 consecutive SLE patients diagnosed according to the 1997 revised ACR criteria, who were treated at the Division of Clinical Immunology and Rheumatology at the University Hospital Center Zagreb (10). The study protocol included an ultrasound and physical examination performed the same day as the regular rheumatologist follow-up and laboratory reevaluation. The MSUS examination was performed in all patients, regardless of the presence or absence of pain and swelling in the joints and tendons. The study was conducted according to the guidelines of good clinical practice as well as the Helsinki Declaration. All patients signed an informed consent form.

Clinical and demographical data (date of diagnosis, disease duration, system involvement, current and previous therapy, previous presence of pain and swelling of the ankle) were collected from each study patient. All patients were subjected to a standardized physical examination that evaluated the presence of painful and swollen joints and deformities (44 joints), with the evaluation of tendons and joints of the feet and ankles. To assess the disease activity, the SLEDAI-2K (Systemic Lupus Erythematosus Disease Activity Index 2000) and ECLAM (European Consensus Lupus Activity Measurement) were used (11, 12). For the purposes of the study, data on patients with SLE included in the hospital register were used as well. A single rheumatologist, who was blinded to the clinical and laboratory data, performed the MSUS examination and scored the static images. The images were also scored by another independent rheumatologist expert in MSUS.

A high-resolution US equipped with a multifrequency linear array transducer (4–15 MHz) with PD was used. Multiplanar examination techniques were performed in accordance with the International Guide-

visoke rezolucije koja može prikazati i strukturu kosti i mekih tkiva te ima visoku osjetljivost na promjene u zglobovima, ali je često nedostupna i preskupa za uporabu u rutinskoj kliničkoj praksi. *Power Doppler* visoke rezolucije (PD) i muskuloskeletni ultrazvuk (MSUS) dokazali su se kao korisne i neinvazivne dijagnostičke metode za procjenu i praćenje promjena zglobova, tetiva i enteza (5). Postoje opsežni literaturni podatci o pozitivnim stranama primjene MSUS-a u raznim upalnim reumatskim bolestima, većinom pri reumatoidnom i psorijatičnom artritisu te spondiloartropatijama (6, 7). Za razliku od toga, nije provedeno mnogo studija koje su proučavale zahvaćenost zglobova u pacijentima sa SLE-om (4, 8, 9).

ISPITANICI I METODE

U pilot-studiju bilo je uključeno 10 uzastopnih ambulantnih bolesnika koji se liječe u Zavodu za kliničku imunologiju i reumatologiju Kliničkoga bolničkog centra Zagreb, a kojima je dijagnoza SLE-a postavljena u skladu s kriterijima ACR-a (*American College of Rheumatology*), revidiranima 1997. godine (10). Protokol studije uključivao je ultrazvučni i fizikalni pregled koji su bili obavljani na dan redovite reumatološke kontrole i rutinske laboratorijske reevaluacije. Pregled MSUS-om obavljen je u svih bolesnika, neovisno o tome jesu li u tom trenutku imali boli ili oticanje zglobova i tetiva. Studija je provedena prema pravilima dobre kliničke prakse i u skladu s Helsinškom deklaracijom. Svi pacijenti potpisali su pristanak kojim potvrđuju da su informirani o sudjelovanju u studiji.

Za svakog uključenog pacijenta prikupljeni su klinički i demografski podatci (datum postavljanja dijagnoze, trajanje bolesti, zahvaćenost pojedinih organskih sustava, trenutačna i prijašnja terapija, oticanje i bol gležnja u prošlosti). Svim je bolesnicima učinjen standardizirani fizikalni pregled kojim je evaluirana prisutnost bolnih i otečenih zglobova te deformiteta (44 zglobova), uz evaluaciju tetiva na gležnjevima. Za procjenu aktivnosti bolesti upotrijebljeni su indeksi SLEDAI-2K (engl. *Systemic Lupus Erythematosus Disease Activity Index 2000*) i ECLAM (engl. *European Consensus Lupus Activity Measurement*) (11, 12). Za potrebe studije upotrijebljeni su i podatci o bolesnicima iz bolničkog registra oboljelih od SLE-a. Ultrazvučni pregled uz bodovanje slikovnih nalaza izveo je reumatolog koji nije bio upoznat s kliničkim i laboratorijskim podacima o bolesniku. Dobivene ultrazvučne slike bodovao je i drugi neovisni reumatolog koji je stručnjak u uporabi MSUS-a. Rabljen je ultrazvučni uređaj visoke rezolucije s linearnom sondom frekvencije 4 – 15 MHz uz upotrebu PD-a. Za prikazivanje TC i ST zglobova, tetiva gležnja, drugog i trećega MCP zgloba, drugog i trećega PIP zgloba, drugog i trećega MTP zgloba, drugog i trećega MCP zgloba te ručnoga zgloba

lines for MSUS in Rheumatology for imaging of the TC and ST joints, ankle tendons, second and third MCP joints, second and third PIP joints, second and third MTP joints, and wrists (13). A total of 18 joints and 20 tendons were examined in each patient and the inflammatory US score and global inflammatory US score were calculated. The joints for global inflammatory US scoring were selected according to the shown frequency of the joint involvement in recent studies. The presence of joint effusion, synovial hypertrophy, bone erosion, tenosynovitis, and enthesitis was defined according to the OMERACT definitions (13). US-detected elementary lesions were evaluated with a dichotomous score (absence/presence). A semi-quantitative scale (0–3) was used for scoring joint effusion, synovial proliferation, and PD.

RESULTS

Ten consecutive patients, all females, were enrolled in the study. The mean age was 45.3 years and the mean disease duration 164 months. Half of the enrolled subjects did not have musculoskeletal symptoms at the time of examination. The demographic, clinical, and serologic data are reported in Table 1. For the majority of patients, treatment was based on corticosteroids alone or combined with various different disease-modifying anti-rheumatic drugs.

Ultrasonographic findings

A total of 180 joints and 200 tendons were examined. Preliminary results in 10 patients showed US-detected inflammatory joint abnormalities in 7/10 (70%) patients and tendon involvement in 1/10 (10%). Both the MTP and TC joints were affected in 60% of the patients, MCP joints in 50%, ST in 40%, wrists in 30%, and PIP joints in 10% of the patients. According to these findings, the TC and MTP were the most frequently involved joints. The most severely affected joints were the TC and MCP, with clinical and ultrasound synovitis at the time of evaluation. The most prevalent pathological US findings in all examined joints were joint effusion and synovial hypertrophy (present in 80% of the patients), while a positive PD signal was rarely detected (30%). Only one patient had bone erosion verified. Furthermore, the most prevalent pathological US finding in the ankles was also joint effusion (60%), less frequently synovial hypertrophy (40%), while a positive PD signal was present in 10% of the patients. As many as 62.5% of the patients without inflammatory joint symptoms had pathological US findings in the ankle joints. The mean value of the global US inflammatory score was 5.6, while the mean value of the ankle US inflammatory score amounted to 2.9.

primijenjene su multiplanarne tehnike pregleda prema međunarodnim smjernicama za MSUS u reumatologiji (13). Ukupno je svakom bolesniku pregledano 18 zglobova i 20 tetiva te su izračunani upalni ultrazvučni zbroj (skor) za svaki pregledani zglob i opći ultrazvučni upalni zbroj. Zglobovi za izračun općeg ultrazvučnog upalnog zbroja odabrani su prema učestalosti zahvaćanja zglobova opisanoj u dosad objavljenim studijama. Prisutnost zglobnog izljeva, sinovijalne hipertrofije, koštanih erozija, tenosinovitisa i entezitisa određena je prema OMERACT-ovim definicijama (13). Osnovne lezije dijagnosticirane ultrazvukom evaluirane su dihotomnim sustavom (odsutnost/prisutnost). Semikvantitativna ljestvica (0 – 3) upotrijebljena je za izračun (skoriranje) zglobnog izljeva, sinovijalne proliferacije i PD-a.

REZULTATI

U studiju je uključeno deset uzastopnih bolesnika, a svi su bili ženskog spola. Srednja dob bolesnica bila je 45,3 godine, uz prosječno trajanje bolesti od 164 mjeseca. Polovina uključenih bolesnica nije imala aktualnih tegoba s muskuloskeletnim sustavom u trenutku pregleda. Demografski, klinički i serološki podatci prikazani su na tablici 1. Kod većine bolesnica terapija je bila bazirana na glukokortikoidima u monoterapiji ili u kombinaciji s različitim antireumaticima koji modificiraju bolest.

Ultrazvučni nalazi

Ukupno je pregledano 180 zglobova i 200 tetiva. Preliminarni rezultati na prvih 10 pacijentica pokazali su ultrazvučno verificirane upalne zglobne promjene u 7/10 bolesnica (70%) i zahvaćenost tetiva u 1/10 bolesnica (10%). I MTP i TC zglobovi bili su zahvaćeni kod 60% pacijentica, MCP u njih 50%, ST u 40%, ručni zglobovi u 30%, a PIP zglobovi u 10% pacijentica. Prema ovim podacima, TC i MTP zglobovi bili su najčešće te ujedno i najteže zahvaćeni, s kliničkim i ultrazvučnim znakovima sinovitisa u vrijeme evaluacije. Najčešći patološki ultrazvučni nalaz kod svih pregledanih zglobova bili su zglobni izljev i sinovijalna hipertrofija (oboje prisutno u 80% bolesnica), dok je pozitivan PD signal rijetko bio prisutan (30%). Kod jedne bolesnice verificirana je erozija kosti. Nadalje, najčešći patološki ultrazvučni nalaz gležnja također je bio zglobni izljev (60%), nešto rjeđe sinovijalna hipertrofija (40%), dok je pozitivan PD signal bio prisutan kod samo 10% bolesnica. Među bolesnicama koje nisu imale simptome sinovitisa, u njih čak 62,5% ultrazvukom su detektirane patološke promjene zgloba gležnja. Srednja vrijednost općeg ultrazvučnog upalnog zbroja iznosila je 5,6, a srednja vrijednost ultrazvučnog upalnog zbroja gležnja iznosila je 2,9.

TABLE 1. Demographic, clinical, and serologic data of enrolled patients according to musculoskeletal disease status
 TABLICA 1. Demografski, klinički i serološki podatci o bolesnicima prema statusu zahvaćenosti muskuloskeletnog sustava

Feature / Obilježje	All patients / Svi bolesnici n = 10	Patients with MSK symptoms / Bolesnici s MSK simptomima n = 5	No MSK symptom / Bez MSK simptoma n = 5
Age, years, mean (range) / Dob, godine, srednja vrijednost (raspon)	45.3 (24–67)	44.8	45.8
Disease duration, months, mean (S.D.) / Trajanje bolesti, mjeseci, srednja vrijednost (S. D.)	164 (121.01)	133.2 (116.5)	194.8 (130.4)
Joint involvement, n (%) / Zahvaćenost zglobova, n (%)	5 (50)	5 (100)	0(0)
CRP, mg/L, mean value (range) / CRP, mg/L, srednja vrijednost (raspon)	8.36 (0.9–57)	1.26	15.46
ESR mm/h, mean value (range) / SE, mm/h, srednja vrijednost (raspon)	34 (8–80)	34.2	33.8
ANA, n (%)	9 (90)	4 (80)	5 (100)
Anti-dsDNA, n (%) / AntidsDNK, n (%)	4 (40)	2 (40)	2 (40)
C3, mg/L, mean value (range) / C3, mg/L, srednja vrijednost (raspon)	1.168 (0.88–1.5)	1.156	1.186
C4, mg/L, mean value (range) / C4, mg/L, srednja vrijednost (raspon)	0.176 (0.05–0.35)	0.134	0.218
Glucocorticoids, n (%) / Glukokortikoidi, n (%)	9 (90)	4 (80)	5 (100)
Glucocorticoids, mean daily dosage, mg / Glukokortikoidi, prosječna dnevna doza, mg	13.25	17.5	12.5
Hydroxychloroquine and chloroquine, n (%) / Hidroksiklorokin i klorokin, n (%)	8 (80)	4(50)	4 (50)
MTX, AZA, MMF, CyA, CyC, n (%)	4 (40)	2(40)	2(40)
SLEDAI-2K, mean value (range) / SLEDAI-2K, srednja vrijednost (raspon)	3.6 (0–10)	5.6	1.6
ECLAM, mean value (range) / ECLAM, srednja vrijednost (raspon)	2.05 (0–5.5)	3	1.1
Number of tender joints, mean value (range) / Broj bolnih zglobova, srednja vrijednost (raspon)	2 (0–10)	4	–
Number of swollen joints, mean value (range) / Broj otečenih zglobova, srednja vrijednost (raspon)	1.3 (0–3)	2.6	–

DISCUSSION

Existing studies indicate a high prevalence of joint and tendon inflammatory changes in SLE patients and it is apparent that ultrasound changes of the hand and wrist joints are common in those patients, depending on the type of arthropathy (4, 8, 9, 14, 15). Furthermore, most studies have shown that there is significant subclinical joint involvement in SLE patients (4, 14, 15). This leads to the conclusion that reliance on the physical examination of the joints can underestimate the presence of active joint inflammation. In the systematic review by Lins and Santiago from 2015, which included a literature overview from 1950 to 2015, the high frequency of subclinical joint and tendon US pathology was also shown (14). Most articles in this re-

RASPRAVA

Dosad objavljene studije upućuju na veliku učestalost upalnih promjena zglobova i tetiva kod bolesnika sa SLE-om, a dokazano je i da se često ultrazvučno mogu detektirati promjene malih zglobova šaka i ručnih zglobova, ovisno o tipu artropatije (4, 8, 9, 14, 15). Također, istraživanja su upozorila na znatnu supkliničku prisutnost patoloških promjena zglobova kod bolesnika sa SLE-om (4, 14, 15). Ovo vodi do zaključka da oslanjanje samo na fizikalni pregled zglobova može dovesti do podcjenjivanja prisutnosti zglobne upale. U preglednom članku Caroline Lins i Mittermayera Santiaga, objavljenom 2015. godine, koji je obuhvatio literaturu od 1950. do 2015. godine, primijećena je velika učestalost supkliničkih ultrazvučnih promjena zglobo-

view demonstrated hand and wrist joint changes (14). In the research by Iagnocco et al. in 2014, ultrasonographic changes of the joints were described in a large proportion of patients (87%), while only 40% of them presented with clinical involvement of the joints. That study unexpectedly showed that the MTP joints were more commonly affected (72% of the patients) compared with the wrist (53%), MCP (46%), and PIP joints (19%) (4). In addition, the MTP joints were affected by more severe inflammatory changes compared with other examined joint levels. There are very few other studies that have evaluated the MTP joint region (4, 15). The high prevalence of MTP joint ultrasound pathology was also demonstrated in a pilot study by Mukherjee in 2016 (15). This study also showed a high frequency of US-detected forefoot bursal prevalence and bursal PD (100% of patients). Significant associations between bursal prevalence and MTP joint PD were noted (15).

Studies conducted in other rheumatic diseases have found US with PD a useful tool for the assessment of pathologies in ankle joint and tendons, as well as the differentiation of inflammatory and degenerative changes (16). To the best of our knowledge, this is the first US study aimed at an analysis of inflammatory changes in the ankle joints and tendons in SLE patients. In our study we found that the most commonly affected joints were the TC and MTP joints (60% of the patients). That correlates with the research of Iagnocco et al., although it has to be noted that ankle joints were not analyzed in that study. Gabba et al., in a study that was conducted in 108 SLE patients with musculoskeletal symptoms, found that patients with active musculoskeletal disease had more US pathology in the joints, while asymptomatic subjects had more pathological findings in the tendons (9). Our findings showed that the most common changes in joints were joint effusion followed by synovial hypertrophy, while a positive PD signal was rarely observed, which correlates with other studies (4, 5). It is important to emphasize that joint effusion was also present in 40% of asymptomatic patients in our study.

Data on the correlation between ultrasound findings and the inflammatory activity index SLEDAI-2k are contradictory. In our study both the SLEDAI-2k and ECLAM indexes were higher in the group of patients with pathological ultrasound findings in the ankle joints than in the group of patients without US changes. SLEDAI was 4.66/2 and ECLAM 2.5/1.375.

CONCLUSION

Results of the preliminary study show a high prevalence of US-verified inflammatory joint changes in SLE patients. Surprisingly, the foot and ankle joints were most commonly affected and a great number of as-

va i tetiva (14). Većina radova u spomenutom članku opisala je promjene u zglobovima šaka te u ručnom zglobu (14). Annamaria Iagnocco i suradnici opisali su u istraživanju objavljenom 2014. godine ultrazvučne promjene zglobova kod velikog dijela bolesnika (87%), dok je njih samo 40% imalo kliničke znakove aktivne zglobne upale. Ta je studija došla do neočekivanih rezultata prema kojima su MTP zglobovi češće zahvaćeni (72%) od ručnih zglobova (53%), MCP zglobova (46%) i PIP zglobova (19%) (4). Isto tako, MTP zglobovi bili su zahvaćeni težim upalnim promjenama u usporedbi s drugim ispitivanim zglobovima. U literaturi se može naći tek nekoliko studija u kojima je evaluirana zahvaćenost MTP zglobova (4, 15). Jedna je od njih pilot-studija iz 2016. godine gdje su Mukherjee i suradnici pokazali veliku prevalenciju patoloških ultrazvučnih promjena MTP zglobova (15). Ta je studija također pokazala veliku učestalost ultrazvučno detektiranih burza prednjeg dijela stopala, kao i veliku učestalost pozitivnog PD-a burza (100% bolesnika). Primijećena je znatna povezanost pojavnosti burza prednjeg dijela stopala i pozitivnog PD signala u MTP zglobovima (15).

Istraživanja provedena pri drugim reumatskim bolestima pokazala su da su UZ i PD korisne metode za procjenu patoloških promjena zglobova i tetiva, kao i za razlikovanje upalnih promjena od degenerativnih (16). Prema našim spoznajama, ovo je prva ultrazvučna studija s ciljem analiziranja upalnih promjena zglobova i tetiva gležnja kod pacijenata sa SLE-om. Naši podatci upozoravaju na to da su najčešće bili zahvaćeni TC i MTP zglobovi (60%). To se slaže s podacima istraživanja koje su objavili Annamaria Iagnocco i suradnici 2014. godine, uz naglasak da u toj studiji nisu bili ispitivani zglobovi gležnja. Alessandra Gabba i suradnici pokazali su u studiji provedenoj na 108 lupusnih bolesnika s muskuloskeletnim manifestacijama u tijeku bolesti da su bolesnici s aktivnom muskuloskeletnom bolešću ultrazvučno dominantno imali zglobne promjene, dok su asimptomatski bolesnici imali više MSUS promjena na tetivama (9). Naši rezultati pokazuju da su najčešće zglobne promjene bile zglobni izljev i sinovijalna hipertrofija, dok je pozitivan PD signal rijetko detektiran, što odgovara podacima iz drugih studija (4, 5). Valja naglasiti da je zglobni izljev također bio prisutan kod 40% asimptomatskih bolesnika.

U dosadašnjim studijama podatci o korelaciji ultrazvučnog nalaza i indeksa upalne aktivnosti – SLEDAI-2k prijeporni su. U našoj studiji oba indeksa, SLEDAI-2k i ECLAM, bila su viša u grupi bolesnika koja je imala patološki nalaz ultrazvuka zglobova nego u grupi koja nije imala ultrazvučnih promjena zglobova. SLEDAI je bio 4,66/2, a ECLAM 2,5/1,375.

ZAKLJUČAK

Rezultati ove preliminarne studije pokazuju veliku prevalenciju ultrazvučno verificiranih upalnih promje-

ymptomatic patients also had pathological US findings in the ankle joints.

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na zglobova kod bolesnika sa SLE-om. Iznenaduje da su najčešće bili zahvaćeni zglobovi stopala i gležnja te da je velik broj asimptomatskih bolesnika imao patološke promjene opisane ultrazvučnim pregledom gležnjeva.

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