Arthroscopy and psoriatic knee joint synovitis.

Carlos D Rosé

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The Journal of Rheumatology is a monthly international serial edited by Earl D. Silverman featuring research articles on clinical subjects from scientists working in rheumatology and related fields.
Arthroscopy and Psoriatic Knee Joint Synovitis

To the Editor:

Hoping to find the key to the "histologic signature" of psoriatic arthritis I started to read with great interest the work by Fiocco, et al.1 Soon, my enthusiasm gave way to concern. That disturbing feeling of "calm passionate disapproval" so well put by the Scottish philosopher David Hume (1711–1776) to describe how we feel when we encounter human behavior that could be rendered wrong.

According to the authors' description, 20 adults with psoriatic and 19 with rheumatoid arthritis underwent arthroscopic examination and synovial biopsy of the knee joint. The sole purpose of the procedure, as it stands in the Methods section, was to compare the visual appearance and histologic morphology of the synovium in these 2 rheumatic diseases. Patients received spinal anesthesia and the procedure lasted an average of 45 minutes. The authors reported no complications.

There are several disquieting elements in this scenario. The first has to do with straightforward risk/benefit analysis. These human research participants draw no direct benefit from the operation (as described), leaving the substantial (certainly more than minor) increase over minimal risk to plain altruism. Such dose of altruism, when viewed under the utilitarian "social justice" umbrella, could have only been justified by the prospect of a monumental contribution to the advancement of generalizable knowledge. With that standard in mind this work in my view did not fulfill criteria.

The phrase "all patients gave written informed consent" is the only reference devoted to human subject protection in this manuscript. There is no allusion to institutional review board (IRB) approval or any specific details or safeguards in the consent process, a fact that is remarkable in a study involving such an invasive intervention. Of course, what lurks behind the question is how much did the subjects really know about the purpose of the surgical procedure before they consented. Furthermore, how much undue pressure (coercion) they suffered by being both patient and subject at the same time, that is the issue of vulnerability, a problem expected to surface always in clinical settings but which acquires unusual relevance in the context of an invasive research procedure. In fact, the International Conference on Harmonisation (Brussels, 1996) defines vulnerable subjects very strin-

gently and includes individuals with incurable disease in that category. A vulnerable subject should be given special protection including the requirement of either minor increase over minimal risk or direct benefit commensurate with the entailed risk before the research is approved. For this protocol, a non-therapeutic trial by ICH definition, at least a mechanism of consent involving an impartial party (unrelated to the investigators) should have been in place.

In summary, we feel the work would be enhanced if the authors can expand on the following issues:

1. Which were the direct benefits (if any) to the subjects.
2. What were the considerations by the Institution's IRB leading to the approval of this study, and confirm that such approval process took place.
3. Which were the safeguards in place during the consent process to assure compliance with the principle of "respect for persons".

This report will benefit from this addition, which in turn will enhance the ethical acceptability of the data presented.

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REFERENCES


Dr. Fiocco, et al, reply

To the Editor:

Dr. Rosé raises some important issues in view of the increasingly extensive use of invasive diagnostic and therapeutic procedures in rheumatology.

As regards his points 1 and 2 ("Which were the direct benefits to the subjects"; "What were the considerations by the institution's IRB leading to the approval of this study"). The aim of our study was to evaluate the diagnostic utility of standard arthroscopy equipped with an image analysis system, to examine the macroscopic appearance of synovial blood vessels in knees of patients with rheumatoid arthritis (RA) and psoriatic arthritis (PsA) who submitted to arthroscopic synovectomy for refractory knee joint synovitis (KJS). Therefore, video-recording of a standardized exploration of the joint, obtained before starting to remove synovium, was processed by dedicated software and used for blind examination.

Everything that occurred after video-recording did not come within the scope of our report. That these patients were arthroscoped for synovecto-

my rather than solely for research purposes makes a difference from the subject protection viewpoint. Unfortunately, that information was not high-

lighted in our manuscript.

Refractory KJS, defined as the persistence of active synovitis after at least 6 months of aggressive local and systemic medical management, is considered a proper indication for arthroscopic synovectomy, within early anatomic stages. The serious long-term outcome of persistent KJS in RA clearly emerges from the recently reported incidence of knee joint arthroplasty, representing 68% of all disease related procedures, in a large series.
of patients⁴. In the last decade, arthroscopic synovectomy has increasingly been extended to earlier disease phases⁵. Unfortunately, blind controlled studies are lacking and not easy to perform, for ethical reasons. Longterm longitudinal followup of the response to arthroscopic synovectomy using objective clinical⁶, ultrasound⁷, and magnetic resonance (MR)⁸ outcomes have highlighted the importance of optimal diagnostic and therapeutic approaches, to slow down the intensity of synovitis before intervention and to prevent KJS relapses.

The introduction of new technologies including arthroscopy, high frequency and power Doppler ultrasound, and MRI can provide fundamental information for new management strategies and early surgical procedures⁹. Diagnostic arthroscopy is indicated when knee symptoms persist in a patient with an established diagnosis of inflammatory arthropathy, despite conventional local therapy for the knee and adequate control of the systemic process⁹. "Prearthroscopic" complications arise when diagnoses that cannot be established or treated by arthroscopy are neglected⁹.

As regards Dr. Rosé's point 3 ("Which were the safeguards in place during the consent process to ensure compliance with the principle of 'respect for persons' ?") in the last 5 years, patients with persistent active KJS attending the Rheumatology Clinic at Padova General Hospital were entered into a protocol for management and followup of KJS supported by the Veneto Region Health authorities (6700/96). Each time, separate written forms for informed consent for each specific therapeutic and diagnostic procedure are submitted to patients. Great importance is placed on patient empowerment: to provide advice in such a way as to enable "prime" patients to ask for information they need to, to enable decisions to be made and to anticipate possible complications through provision of clear, specific information. The General Guidelines for Therapy are followed with the aim to achieve remission, followed by timely strengthening exercises, and the identification of nonresponders. Conventional radiology, ultrasound, and MRI are performed at entry and repeated according to the clinical picture and response to treatment during followup.

Suggested indications for arthroscopy in patients with inflammatory arthritis are, for example: symptoms unresponsive to medical treatment; symptoms disproportionate to clinical findings; and uncertain diagnosis. Arthroscopic synovectomy is always done by consultant orthopedic surgeons in an operating room (OR) of a knee surgery department, in the presence of the rheumatologist who is aware of the patient's clinical condition. Diagnostic arthroscopy is now also performed by rheumatologists in multidisciplinary day surgery (OR), under monitored anesthetic care, combined with local anesthesia if deemed appropriate. Monitored anesthetic care allows possible coupling of diagnostic and therapeutic phases of arthroscopy, after recognition of specific intraarticular lesions requiring operative procedures, thus reinforcing the collaboration with orthopedic surgeons⁸,¹⁰.

Also considered are guidelines for practising arthroscopy by rheumatologists (to obtain data to support patient diagnosis; to document all elements of comprehensive management; to explain procedures; to select therapeutic arthroscopic procedures with due consideration; to prepare reports of procedures, and to ensure continuity of management)⁸.⁰.

We agree that ongoing discussion on this subject would certainly be useful, to enhance the principle of respect for persons.

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In Quest of the Holy Grail: Efficacy versus Effectiveness in Rheumatoid Arthritis

To the Editor:

In her intriguing editorial⁴, Dr. Maria E. Suarez-Almazor asked, "Are clinical trials enough for health care decision making?" She asserts that observational studies and surveys are helpful in determining the community effectiveness of drugs, while clinical trials can only determine a drug's efficacy. I agree that efficacy is necessary but not sufficient to ensure a drug's effectiveness in community practice.

The model of community effectiveness (community effectiveness = efficacy x access x diagnosis x recommendation x adherence) is useful because it emphasizes that multiple variables, in addition to clinical efficacy, influence effectiveness. However, with this model, poor community effectiveness scores are more reflective of current practice of medicine than the effectiveness of the treatments. For example, under Dr. Suarez-Almazor's base scenario (1.0 x 0.80 x 0.85 x 0.85 x 0.70) even a treatment that is 100% effective will be given to less than 50% of patients, and under the more optimistic scenario (1.0 x 0.90 x 0.90 x 0.90 x 0.80) this increases to only 58%. I believe that disease prevalence should also be considered in the evaluation of community effectiveness scores.

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munity effectiveness. Since about 2.1 million people in the US have rheumatoid arthritis, a community effectiveness value of 24% would still benefit a half million patients.

Dr. Suarez-Almazor compares the efficacy and effectiveness of 4 disease modifying antirheumatic drugs (DMARDs), methotrexate, leflunomide, etanercept, and anakinra, reported in 3 studies. However, comparison of these studies is questionable, because the studies are widely different in their objectives, methods, and patient populations; therefore, their results cannot be directly compared. Both the leflunomide and etanercept trials were placebo controlled (that is, patients were prohibited from receiving any DMARD). The anakinra trial included an active control of methotrexate. The anakinra trial tested the hypothesis that anakinra in combination with methotrexate is better than methotrexate alone. The other 2 trials test the hypothesis that leflunomide or etanercept is better than no DMARD. It is inappropriate to compare the treatment effects across clinical trials with such divergent objectives. The methods used in the studies also differ. In the leflunomide trial, response rates were calculated after 12 months of therapy, while in the etanercept and anakinra studies response rates were calculated after 6 months. The leflunomide and etanercept trials used a last-observation-carried-forward (LOCF) imputation technique for dropouts and missing data, while the anakinra trial used a nonresponder imputation technique. The LOCF method can result in higher response rates. All these differences confound the comparison of these studies.

Dr. Suarez-Almazor acknowledges that her example is overly simplistic, since it is based on only on efficacy data and does not consider other important factors, such as toxicity, joint damage, or quality of life. I believe that it is very important to consider the safety profile of an agent when calculating community effectiveness, since a safer product may be more likely to be adopted, increasing the community effectiveness.

In conclusion, I agree with Dr. Suarez-Almazor's hypothesis, that results from a clinical trial may not predict how effective a therapy will be in the clinical setting. However, comparison of clinical effectiveness and efficacy must be done among similar studies. We need to determine how we can increase the adoption of new therapies with good efficacy and safety profiles to maximize the benefit to patients.

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Dr. Fleischmann is an advisor/consultant and has performed clinical studies for Aventis, ImmuneX, Wyeth Ayerst, and Amgen Pharmaceuticals.

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Dr. Suarez-Almazor replies

To the Editor:

I appreciate Dr. Fleischmann's comments, and for the most part agree with him. The objective of the editorial was not to compare the efficacy or the effectiveness of disease-modifying drugs in rheumatoid arthritis (RA), which would require a thorough, systematic review of the trials with regard to patient populations, benefits, and risks. Rather, I wanted to demonstrate with simple numerical examples the potential importance of health system and patient variables on the overall effectiveness of therapies in the community. These factors are often overlooked by clinical researchers, and are seldom mentioned in textbooks or reviews regarding the treatment of RA. It has been my experience that clinicians, researchers, and policy makers recognize the importance of access to health care or adherence to treatment. However, the extent to which these issues may influence overall effectiveness is often underestimated.

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SAPHO Syndrome and Transient Hemiparesis in a Child: Coincidence or New Association?

To the Editor:

The case report of SAPHO syndrome with transient hemiparesis in a child with clavicular osteitis prompted us to briefly describe the opinion of German rheumatologists about the SAPHO syndrome and also to comment on the case. We regret that the German literature is no longer read or cited, thus being lost to international experience and knowledge, especially as far as clinical, radiologic, and histopathologic findings are concerned.

Our experience is based on this 3 dimensional analysis of a patient collective with the SAPHO syndrome, which we first published 2 years ago with 86 cases and which presently includes 140 patients. Our results, which could correct and enhance precision of the opinion of the last 15 years, proceed from the clinically decisive experience that this syndrome is not a nosologic entity and therefore cannot represent a diagnosis, but rather offers a heterogeneous picture of diseases with various symptom combinations, which are mainly kept together by the potential of psoriasis-arthritic dermatos-arthroskeletal associations.

The 2 entities that predominantly present the SAPHO syndrome are as follows.

1. With 40% of all cases: "chronic recurrent multifocal osteomyelitis" (CRMO), which we have newly defined and characterized as "primary chronic poly-osteomyelitis" with "sympathetic arthropathy", and which was expanded with the adult form. Its histopathogenesis, starting as reactive osteomyelitis, equals a plasma cell-sclerotic process, which comprises 3 stages, mainly lympho-plasmacellular with ossifying periostitis, and which ends as "sclerotic osteomyelitis" (Garrê). Important for clinical evaluation is the early magnetic resonance imaging (MRI) finding of a partly extended, "cloudy," soft tissue edema surrounding the involved tubular, flat, and spinal bones: the parossus inflammatory edema with infiltration and inflammatory affection of neighboring nerve and vascular structures.
2. In 24% of our cases: the disease we described as "spondylarthitis hyperostotica postulo-psoriasica". It appears in adults as a triad of sternocostoclavicular hyperostoses (SCCH), hyperostotic shaped spondyloepaphy, and postulosis pulmo-planartarsal (psoriatica) (PPP), and it corresponds pathogenetically to HLA-B27 negative entheseopathy.

Three additional smaller groups are dominated by the disease presentations of:

3. inflammatory syndrome of the anterior chest wall (ACW syndrome);
4. sternocostoclavicular hyperostoses (which are not found in childhood); and
5. arthropastical association with psutarul acne.

The quality of CRMO-osteomyelitis, which remained unnoticed until recently, is its sometimes widely extended parapathologic inflammatory edema, which up to now has only been acknowledged in SCCH of the adult as a fibrotic mass stenosing the subclavian vein mediastinally or supra-

Correspondence
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clavicularly. The early stage, which is already clinically complicated, can only be recognized by MRI. We have observed the following as clinically striking synovial, vascular, neurologic, or visceral neighboring complications close to metaphyseal, pelvic, vertebral, clavicular, or mandibular bony areas, which are affected by osteomyelitis, retroperitoneal fibrosis in iliac osteitis, painful neuritis of the plexus, exudative pleuritis and pericarditis, as well as pneumonitis of the upper lobe and intercostal neuralgias in spondylitis of the lower cervical or the middle thoracic spine, an aortitis between sternal and vertebral osteomyelitis, and finally stenosis not only of the subclavian vein (as in SCCH) but also of the subclavian artery in a 9-year-old boy with primary chronic osteomyelitis of the right clavicle. This subacute osteomyelitis, lympho-plasmacellular in biopsy and negative in culture, had to be considered as a monostotic form of juvenile CRMO. The MRI showed a vast soft tissue swelling extending wide into the axillary area (Figure 1) and in this circumstance the MRI angiography revealed stenosis of the subclavian vein and artery (Figure 2), in the course of which the venous stenosis manifested the typical visible subcutaneous collateral circulation. Localization of the arterial stenosis did prevent a subclavian-steel syndrome. Our regimen with the effective longterm combination therapy of azithromycin and calcitonin resulted in prompt healing of the initially voluminous, hyperostotic, periosteoosseus and edematous surrounding process. This case is documented together with another 11 cases of the clavicular type, i.e., with 21% of our CRMO patient collective. It resembles the case presentation of Vanin, et al.1 but without neurologic deficits.

The authors of the case report from Padua are searching for a cause of the transient hemiparesis of their patient. They assume a reversible ischemic neurologic deficit syndrome as the likely cerebral cause, yet could not detect the pathogenetic correlation with the clavicular osteomyelitis. According to our experience, we can postulate that an inflammatory process in the neighborhood of the clavicular osteomyelitis could cause thrombosis or stenosis of an artery, as a possible explanation for an ischemic event of the cerebrum. Moreover, in our opinion, we would classify this patient among the SAPHO syndrome as a juvenile CRMO with primary chronic osteomyelitis of the clavicle.

![Figure 1. Chronic recurrent multifocal osteomyelitis of the right clavicle.](image1)

![Figure 2. Contrast enhanced MRI angiography shows a stenosis of the subclavian artery and vein.](image2)

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CA15-3 and Cancer Associated Serum Antigen Assays Are Alternatives to the KL-6 Assay for Measuring Serum MUC-1 Levels in Patients with Intestinal Lymphoid Tumor Disease Associated with Polymyositis/Dermatomyositis

To the Editor:

We read with great interest the report by Nakajima, et al. describing the utility of serum KL-6 antigen levels in the diagnosis and monitoring of interstitial lung disease (ILD) associated with rheumatoid arthritis, systemic sclerosis, and polymyositis/dermatomyositis (PM/DM). However, the KL-6 assay (BD406; Eisa Co. Ltd., Tokyo, Japan) is not readily available outside Japan. The KL-6 antibody recognizes an undefined sialylated carbohydrate side-chain epitope on the high molecular weight mucin MUC-1. There are at least 3 other commercial assays available for measuring MUC-1, namely the tumor marker assays for CA15-3/BR, cancer associated serum antigen (CASA), and CA19-9. The CA19-9 assay (Bayer Diagnostics, Tarrytown, NY, USA) also recognizes sialylated carbohydrate side-chain epitopes (specifically sialyl Le"a) on MUC-1, while the former 2 assays employ monoclonal antibodies that recognize amino acid sequences on the central protein core of MUC-1, specifically "PDTRP" for the CA15-3/BR assay (Bayer Diagnostics) and "APDTR" for the CASA assay (Medical Innovations, Sydney, Australia).

We recently saw 2 patients with biopsy proven ILD associated with DM (first case) or PM (second case), with elevated serum CA15-3/BR and CASA levels but no evidence of an underlying malignancy. The first case had a video assisted thoracoscopic biopsy, which showed a predominant pattern of diffuse alveolar damage with a minor component of organizing pneumonia; the second case had a right lower lobe wedge biopsy, which showed features consistent with usual interstitial pneumonitis (UIP). The peak levels of CA15-3/BR and CASA were 310 kU/L (reference range < 30) and 366 kU/L (reference range < 60) in the first case, and 148 kU/L and 146 kU/L in the second case. In both cases, the levels of CA15-3/BR and CASA normalized after successful immunosuppressive treatment of the lung disease, consistent with the findings of Nakajima, et al. Interestingly, CA19-9 levels were not elevated in either case, with peak levels of 16 kU/L and 22 kU/L (reference range < 40), respectively. This is consistent with the findings of Yokoyama, et al. that the CA19-9 assay had a lower sensitivity (42.9%) than the KL-6 assay (74.3%) in patients with intestinal pneumonia. However, there are no published comparative studies between the KL-6, CA15-3/BR, and CASA assays in this setting.

We therefore suggest that the CA15-3/BR and CASA assays are more
Cerebral Embolism Complicating Libman-Sacks Endocarditis — Full Recovery Using Recombinant Tissue Plasminogen Activator

To the Editor:

Ischemic stroke occurs in 10–20% of patients with systemic lupus erythematosus (SLE), and emboli from a cardiac source may occur in 70–90% of these patients. We describe a patient with SLE who had a thromboembolic stroke due to Libman-Sacks endocarditis and made a good recovery after early administration of recombinant tissue plasminogen activator (rtPA).

A 28-year-old woman was admitted with sudden complete aphasia and right side weakness that occurred in our lupus clinic waiting room. She had developed SLE 10 years previously, with renal, neuropsychiatric, and skin involvement and was treated with prednisolone, intravenous cyclophosphamide, azathioprine, and hydroxychloroquine. On admission, her SLE was in remission with hydroxychloroquine 200 mg and prednisolone 7.5 mg daily. She had no "traditional" cardiovascular risk factors and was not taking an oral contraceptive.

Clinical examination revealed blood pressure 130/60, pulse 80/min and regular. No cardiac murmur was detected. She had a right upper motor neurone facial weakness, a right hemiparesis, right side visual neglect, and right hemi inattention. There was increased tone and exaggerated tendon reflexes on the right and the right plantar was extensor. She was unable to walk. Fundoscopy was normal. Laboratory investigations revealed white blood cells 8200/µm³, hemoglobin 13.6 g/dl, platelets 171,000/µm³, erythrocyte sedimentation rate 2 mm/h, C-reactive protein < 5 mg/l, glucose 4.9 mmol/l, total cholesterol 5.6 mmol/l, triglycerides 2.08 mmol/l, creatinine 86 µmol/l, creatinine clearance 86 ml/min, total protein excretion 1.69 g/24 h, glomerular filtration rate 111.9 ml/min, antinuclear antibodies weakly positive, anti-DNA negative, extractable nuclear antigens were SSA/Ro positive; RNP, Sm, SSB/La negative; complement C3 1.12 g/l (normal 0.75–1.65) and

Drs. Harigai and Kamatani reply

To the Editor:

We read with interest the letter by Dr. Wong, et al reporting alternative assay systems for serum MUC-1 levels in patients with polyomysitis/dermatomyositis (PM/DM).

In our report, we demonstrated that serum KL-6 levels were higher in patients with connective tissue diseases with interstitial pneumonitis (IP) than in those without IP. Our study included 57 patients with rheumatoid arthritis, 47 with systemic sclerosis, 21 with PM/DM, and 18 with systemic lupus erythematosus. Serum KL-6 levels were significantly higher in patients with connective tissue diseases with active IP (n = 43) compared to those with inactive IP (n = 18). Finally, serum KL-6 levels increased or decreased along with the deterioration or amelioration of IP, respectively (n = 13).

Although both CA15-3/BR and CASA decreased after successful treatment of IP in Dr. Wong’s 2 cases, further analysis is obviously required to determine whether these methods could really be alternatives to KL-6. Serum levels of CA15-3/BR and CASA should be determined in patients with PM/DM as well as other connective tissue diseases with or without IP. Serum levels of these markers should also be compared between patients with active and inactive IP. After these analyses, one could claim that these methods are alternatives to KL-6.

One of Dr. Wong’s cases revealed usual interstitial pneumonitis (UIP) by wedge biopsy. The UIP pattern, which is visible as honeycomb lung on chest computed tomography (CT), usually indicates chronic and inactive IP. We have measured serum KL-6 levels in many PM/DM patients with honeycomb lung by chest CT, and found that their KL-6 levels did not change during 3 or 4 years of observation. Their arterial blood oxygen levels did not decrease, and their clinical signs and symptoms and chest CT did not deteriorate. Therefore, it should be carefully determined whether the decrease of CA15-3/BR and CASA after immunosuppressive treatment in their UIP case is really associated with amelioration of IP.

Hopefully, the KL-6 assay will soon become available in other countries and its usefulness can be confirmed.

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Antinflammatory Effect of Simvastatin in Patients with Rheumatoid Arthritis

To the Editor:

Statins, which inhibit 3-hydroxy-3-methylglutaryl co-enzyme A (HMG-CoA) reductase, are widely used to treat hyperlipidemia. Recent studies have suggested that statins not only lower plasma lipid levels but also reduce coronary events1, improve outcomes after cardiac transplantation2, and prevent osteoporosis or Alzheimer disease3,4. In particular, the immunosuppressive effect of statins has been highlighted. In vitro studies have revealed possible mechanisms of immunosuppression by statins, including suppression of natural killer cells5, regulation of DNA synthesis in cycling cells6, and an inhibition of monocyte chemotaxis7. These lines of evidence suggest a new clinical application of statins as an immunomodulator in autoimmune diseases such as multiple sclerosis and rheumatoid arthritis (RA). To address this issue, we serially evaluated immunological, inflammatory, and clinical variables in patients with RA taking simvastatin for coexisting hypercholesterolemia.

From March to July 2001, 8 patients with RA who also had hypercholesterolemia (> 232 mg/dl) requiring lipid-lowering treatment were enrolled in this study after giving written informed consent. They were 6 women and 2 men with a median age of 57 years (range 49-75). The median duration after the diagnosis of RA was 12 years (range 5-28). All patients except one were stage III or IV by Steinbrocker classification and class III or IV by RA classification. All patients took simvastatin 10 mg per day for 12 weeks. Other treatments, such as disease modifying antirheumatic drugs, glucocorticoids, and nonsteroidal antiinflammatory drugs for RA, had not been changed from 3 months before beginning simvastatin administration through the study period.

Table 1. Summary of changes in clinical and laboratory variables before versus at the end of simvastatin therapy. Indicated values are the median (range).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before</th>
<th>End</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tender joint count</td>
<td>8 (4-29)</td>
<td>6 (0-20)</td>
<td>0.02*</td>
</tr>
<tr>
<td>Swollen joint count</td>
<td>7 (2-19)</td>
<td>5 (0-15)</td>
<td>0.07</td>
</tr>
<tr>
<td>Patient assessment of pain (VAS)</td>
<td>4.5 (1.5-7.5)</td>
<td>4.4 (1.3-7)</td>
<td>0.20</td>
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<tr>
<td>Patient assessment of disease activity (VAS)</td>
<td>5.3 (2-7.5)</td>
<td>4.6 (1.5-7)</td>
<td>0.03*</td>
</tr>
<tr>
<td>HAQ</td>
<td>10 (1-18)</td>
<td>11.5 (0-18)</td>
<td>0.11</td>
</tr>
<tr>
<td>Physician assessment of disease activity (VAS)</td>
<td>4.1 (2.0-9.0)</td>
<td>3.5 (0.8-7.5)</td>
<td>0.18</td>
</tr>
<tr>
<td>RF, IU/ml</td>
<td>76 (20-525)</td>
<td>65 (20-370)</td>
<td>0.03* (4w 0.02)*</td>
</tr>
<tr>
<td>ESR, mm/h</td>
<td>51 (27-96)</td>
<td>43.5 (23-107)</td>
<td>0.33 (4w 0.01)**</td>
</tr>
<tr>
<td>CRP, mg/dl</td>
<td>2.2 (0.5-6.9)</td>
<td>1.6 (0.4-4.7)</td>
<td>0.18 (4w 0.12)**</td>
</tr>
<tr>
<td>CD3, µl</td>
<td>1077 (471-1638)</td>
<td>1227 (400-1533)</td>
<td>0.89</td>
</tr>
<tr>
<td>CD19, µl</td>
<td>104 (32-140)</td>
<td>95 (28-171)</td>
<td>0.89</td>
</tr>
<tr>
<td>CD56, µl</td>
<td>202 (109-897)</td>
<td>167 (153-874)</td>
<td>0.5</td>
</tr>
<tr>
<td>HLA-DR+ CD3+CD4+, %</td>
<td>11.3 (8.6-19.0)</td>
<td>13.3 (6.8-27.9)</td>
<td>0.13</td>
</tr>
<tr>
<td>HLA-DR+ CD19+CD19+, %</td>
<td>97.2 (78.1-100)</td>
<td>98 (87.7-100)</td>
<td>0.69</td>
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<tr>
<td>HLA-DR+ CD14+CD14+, %</td>
<td>99.7 (98.8-100)</td>
<td>99.8 (99.2-100)</td>
<td>0.8</td>
</tr>
<tr>
<td>Th1/Th2</td>
<td>6.8 (3.9-7.2)</td>
<td>5.8 (3.2-9.9)</td>
<td>0.16*</td>
</tr>
<tr>
<td>Total cholesterol, mg/dl, mean ± SD</td>
<td>248 ± 21</td>
<td>189 ± 9.3</td>
<td>0.01*</td>
</tr>
<tr>
<td>HDL-cholesterol, mg/dl, mean ± SD</td>
<td>65.1 ± 14.2</td>
<td>70.1 ± 22.2</td>
<td>0.07</td>
</tr>
</tbody>
</table>

* p < 0.05. † 4W: at 4 weeks.
VAS: visual analog scale; HAQ: Health Assessment Questionnaire; RF: rheumatoid factor; ESR: erythrocyte sedimentation rate; CRP: C-reactive protein.

The mechanism of immunosuppressive effect of statins is not fully understood; however, 2 distinct molecular mechanisms have been proposed recently. One is a repression of the induction of MHC-II expression induced by interferon-γ on human endothelial cells and macrophages8,9. Another is a selective inhibition of the molecular association between leukocyte function antigen-1 (LFA-1) and intercellular adhesion molecule-1 by competitive binding to the L-site of LFA-1. We analyzed the expression levels of MHC-II on T cells, B cells, and monocytes in peripheral blood from 8 patients to clarify the molecular mechanism of our results. However, we could not find significant changes of the MHC-II expression levels on these cells by simvastatin. The analysis of numbers of T cells, B cells, and NK cells showed no consistent changes at the end of the treatment.

This is the first clinical study evaluating the effect of statins on RA. The number of patients in our study was relatively small because we enrolled only patients.
those requiring lipid-lowering treatment among RA patients. In addition, most enrolled patients had a long history of RA and had severe joint deformities; therefore, it might not be appropriate to enroll these patients in the study evaluating effects of statins on active manifestations in RA. In spite of these conditions, our data suggest that simvastatin could suppress inflammatory variables as well as clinical symptoms in RA. Based on these findings, we will extend this study to evaluate the benefit of simvastatin in larger numbers of patients with active RA.

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Figures

Figure 1. Changes in clinical variables of RA from beginning ("before") to the end of simvastatin therapy. Y-axes show clinical variables of RA, including (a) patient assessment of pain on VAS, (b) patient assessment of disease activity on VAS, (c) HAQ score, (d) physician assessment of disease activity on VAS, (e) swollen joint count, (f) tender joint count. "Before" represents the data before simvastatin administration and "end" data at 12 weeks or at the end of the study for the dropouts. Patient assessment of pain on VAS (a), HAQ score (c), and physician's assessment of disease activity on VAS (d) did not change between beginning and end of simvastatin therapy. However, patient assessment of disease activity on VAS (b) and tender joint count (f) improved significantly, in spite of no changes in swollen joint count (e).

Figure 2. Changes in inflammatory variables of RA between beginning and at the end of simvastatin therapy. Y-axes show inflammatory variables of RA, including (a) ESR, (b) CRP, (c) RF. Solid lines show values during simvastatin therapy and broken lines show values after discontinuation of simvastatin. ESR, CRP, and RF levels showed tendency to decrease at the end of simvastatin therapy. After the discontinuation of simvastatin in 3 patients, the levels of ESR and CRP rose again.
REFERENCES


