The Journal of Rheumatology

INSTRUCTIONS FOR LETTERS TO THE EDITOR

Editorial comment in the form of a Letter to the Editor is invited; however, it should not exceed 800 words, with a maximum of 10 references and no more than 2 figures (submitted as camera ready hard copy per Journal Guidelines) or tables and no subdivision for an Abstract, Methods, or Results. Letters should have no more than 3 authors. Full name(s) and addresses of the author(s) should accompany the letter as well as the telephone number, fax number, or E-mail address.

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Letters

Beneficial Effect of Being Outdoors in Rheumatoid Arthritis

To the Editor:

The widespread opinion of patients with rheumatoid arthritis (RA) that weather influences their complaints has remained scientifically elusive[1-7]. A factor that might have masked the relationship between RA variables and the weather is the extent to which the patients studied were actually exposed to it. For example, outdoor frost will have little effect on patients staying indoors all day.

One of the authors (WRP), a 54-year-old man, nonsmoker, has had rheumatoid factor positive RA since 1979 (revised American College of Rheumatology criteria[8]). Over a period of 4 years, he daily quantified his joint pain (n = 848 days) as described[3] (trace 3 in Figure 1), and the time he spent outdoors (n = 1200 days) (Figure 1, trace 2). The erythrocyte sedimentation rate (ESR) was determined regularly (n = 107) (Figure 1, bottom trace). During the study, medication was stable.

During all periods in which about 3 hours were spent outdoors daily (shaded in Figure 1) and with a relatively low outdoor temperature (top trace), the pain score as well as the ESR decreased, or remained at a low level (B, D, H, begin and end J, and L in Figure 1). At high outdoor temperatures the pain score and the ESR increased slightly (F and J). During the remaining periods (mostly < 3 hours outdoors), the RA variables in general varied with outdoor temperature, but periods in which he was only briefly outdoors (< 1 hour daily) were associated with an increase in pain score and ESR (second half of period G, the last quarter of period I, and period K).

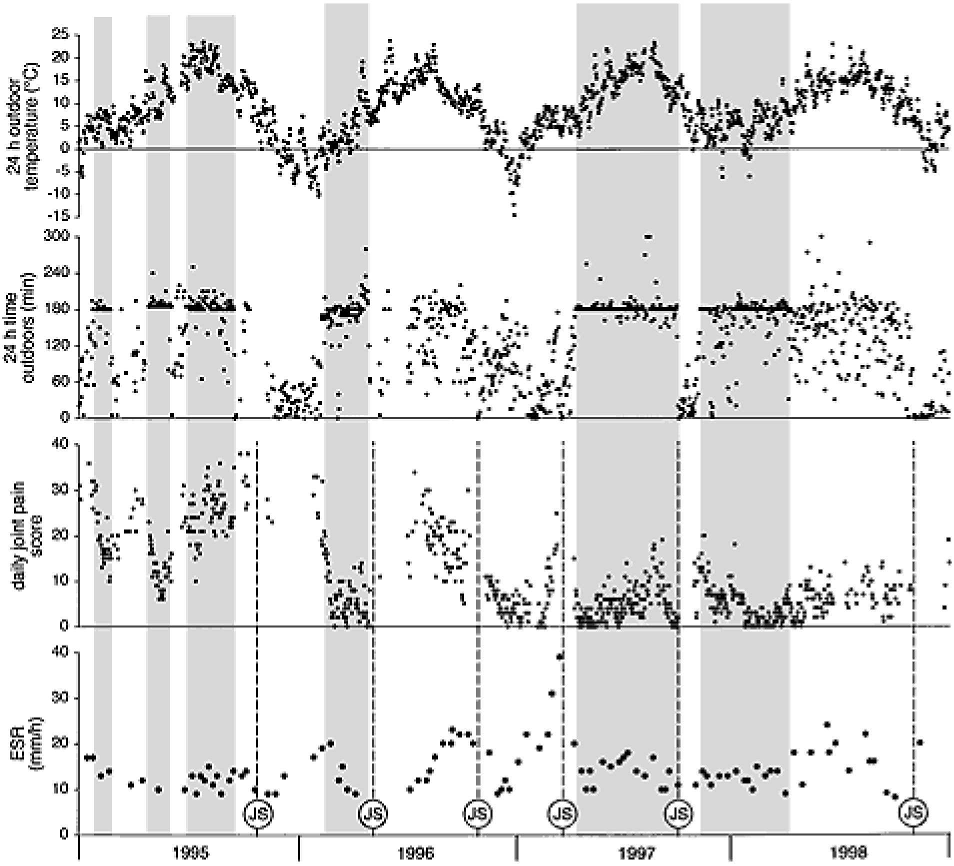

Figure 1. Plot of 24 hour mean outdoor temperature, time outdoors per 24 hours, daily joint pain score, and ESR. Periods during which the daily time outdoors was about 3 hours are shaded. Broken lines (JS) indicate days on which joint surgery was carried out.

Joint surgery ("JS" in Figure 1) that was carried out during the study hardly influenced the RA variables since none of the joints involved was severely inflamed and the main indication for surgery was deformity and not pain.

The delayed effect on pain score of time spent outdoors is shown in Figure 2 as the average change in pain score for 30 days following all days that satisfied a certain criterion — as described in A, B, C, and D. The difference between the curves is the number of successive days that met the criterion (1 to 20), as indicated by the length of the first part of the curve (bold line). For example, the bottom line in Figure 2D shows the course of the average change in pain score during (bold line) and after (regular line) 20 successive days with outdoor temperature < 6°C and time outdoors ≥ 2 hours. The change in pain score was always calculated with respect to the pain score on the first of the successive days that met the criteria.

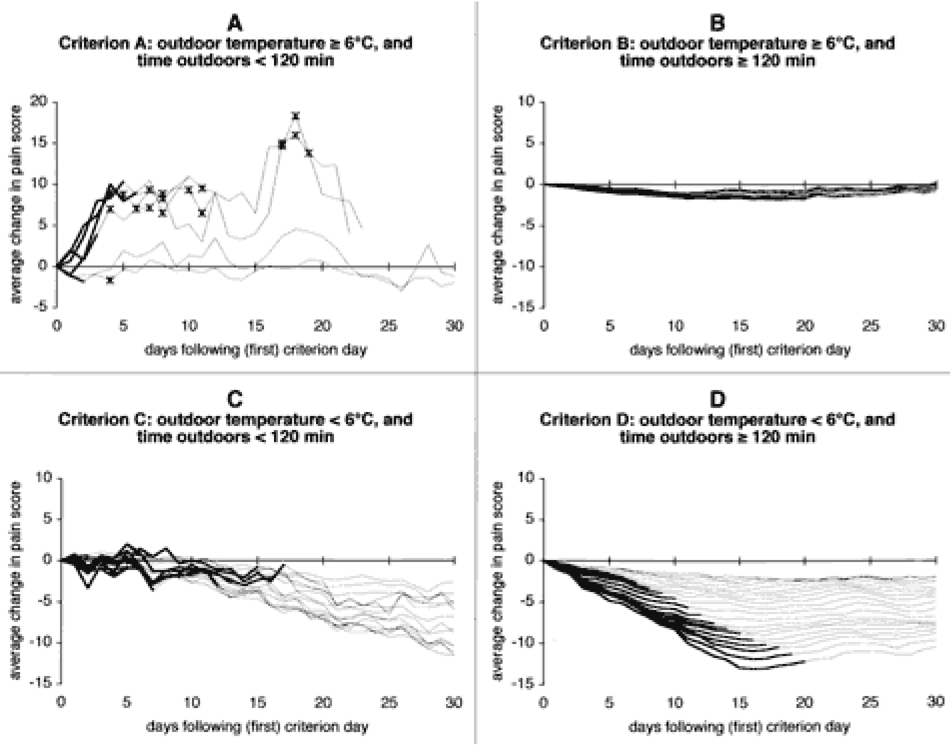

Figure 2. Average change in pain score following one or more successive days (up to 20) meeting 4 different criteria (A to D) of daily outdoor temperature and time outdoors (1995-98). Limited data restricted the analysis to responses following maximally 6 and 17 successive criterion days in A and C, respectively. Curves were truncated when < 3 pain scores contributed to the average (A). Number of data of the averages plotted varies considerably: 3-55 (A), 95-435 (B), 3-74 (C), and 11-160 (D). Differences from zero were tested for significance with Student t test. In A, significant values are indicated with asterisks. In B, significant values occurred beyond Day 4 and before Day 26 (on Days 9 through 13, and on Day 16, all values were significant). In C, most values beyond Day 12 were significant. In D, all values beyond Day 2 were significant.

Being outdoors briefly on warmer days (≥ 6°C) increased the pain score as long as the criterion was satisfied (A). Thereafter, the curves level off, which is likely due to the contribution of warm days with time outdoors > 2 hours. Figure 2B illustrates this contribution: staying outdoors for 2 hours or more on days warmer than 6°C hardly affected the pain score.

Being outdoors briefly on cold days had little effect on the pain score (C). After the periods satisfying the criterion (bold line on curve) the curves tend to decrease steeply (thin lines). The explanation may be that cold days with outdoor times > 2 hours did contribute to the averages here as well. A clear decrease in pain score was found for staying outdoors > 2 hours (D). The longer the period of successive days that satisfied the cold criterion, the greater was the decrease.

Depending on the average time outdoors of the preceding 14 days, the ESR data were grouped in 1 hour periods. The mean ESR per period decreased with increasing time outdoors: 0 to 1 h: 18.00 (SD 7.03), 1-2 h: 15.53 (SD 7.03), 2-3 h: 14.60 (SD 4.05), 3-4 h: 12.50 mm/h (SD 2.46). The mean ESR in the last period was significantly lower than in the first ($p < 0.05$, ANOVA with Tukey correction).

The effect of daily time spent outdoors is in accord with the earlier reported effect of outdoor temperature on pain and ESR[9]: a low outdoor temperature as well as being outdoors (on most days in a marine climate) will have a cooling effect on the microclimate. In general, outdoor activities were light, and the chilly feeling during stays outdoors was the main experience of the (mostly lightly dressed) patient in this study.

A possible explanation for the effect of exposure to a cool environment might be related to skin vasoconstriction, or to the well known increased production of cortisol[10]. Whatever the influencing variable(s) might be, this 4 year study shows that being outdoors for 3 hours per day or longer appears to have a beneficial effect on this patient's RA.

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Monoarthritis as Presenting Sign of Stress Fracture

To the Editor:

Stress fracture is a common injury seen by health care professionals caring for athletes. However, they are being increasingly reported as a common cause of morbidity in both healthy populations and those with underlying diseases involving abnormal bone[1]. We read with interest the article by Zuber on clinical presentation of stress fracture[2]. The diagnosis and treatment of stress fractures is a challenge for the rheumatologist. An accurate history and examination is essential[3]; also, a high index of suspicion combined with a strong knowledge of at-risk stress fractures is required. We report our experience in a case of monoarthritis as presenting sign of stress fracture that could not be detected by conventional radiography.

A 45-year-old woman presented at the emergency room with a 2 week history of swelling and pain in her left ankle. Her history was unremarkable. She had no menstrual disturbances, leg length differences, genetic factors, or eating disorders. However, she worked as a janitor for at least 12 hours a day. On examination the left ankle was swollen with tenderness to palpation. She was afebrile. No other abnormalities were found. The erythrocyte sedimentation rate was 45 mm/h. Full blood cell count, coagulation test, routine biochemistry profile, bone metabolism variables, and thyroid stimulating hormone and T4 levels were normal. Rheumatoid factor and antinuclear antibodies were negative. Tuberculin skin test, seroagglutinations, and Coombs' test for brucella were also negative. A radiograph of the left ankle was normal. Fine needle aspiration of the ankle yielded only a scarce amount of bloody material. Cultures of this material were negative. Not enough material was available for histological study. Magnetic resonance imaging (MRI) of the left ankle disclosed mild synovial effusion and a linear zone of low signal intensity surrounded by a wider, poorly defined area of slightly higher signal intensity in the distal metaphysis of the tibia (Figure 1). A diagnosis of stress fracture was established. Treatment with immobilization was performed.