

## CONCISE REPORT

# The cervical spine in patients with psoriatic arthritis

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**Objective:** To establish the incidence of clinically important inflammatory cervical spine abnormalities in radiographs of patients with psoriatic arthritis (PsA).

**Methods:** Patients were selected from a rheumatological outpatient clinic and one ward of the Rheumatism Foundation Hospital, Heinola, Finland, by examining 160 consecutive PsA cases. A total of 65 patients (38 women, 27 men) with PsA were identified who had cervical spine radiographs available. These were evaluated for inflammatory changes, and patient records studied for disease characteristics, laboratory and clinical findings.

**Results:** In 12 cases (18%) inflammatory cervical spine changes were seen in the cervical spine radiographs. The most frequently detected was apophysial joint ankylosis, seen in seven patients (11%). Anterior atlantoaxial subluxation (aAAS) was seen in five (8%) and atlantoaxial impaction in three (5%). In 20 of the 40 patients who had the rotational range of neck motion measured the measurement was  $\leq 45^\circ$  either to the left or the right side.

**Conclusion:** Inflammatory cervical spine changes were not commonly seen in radiographs of patients with PsA. Apophysial joint ankylosis and aAAS were detected most often. PsA may decrease the rotational range of neck motion significantly.

Psoriatic arthritis (PsA) presents clinically as distal joint disease, polyarthritis, arthritis mutilans, oligoarthritis, or axial disease.<sup>1</sup> Inflammatory changes in the cervical spine have been reported in 42%, 70%, and 75% of patients with PsA.<sup>2–4</sup> Those publications report apophysial joint ankylosis, atlantoaxial subluxation (AAS), atlantoaxial impaction (AAI), and ligamentous calcification.

Patients with PsA often have neck symptoms, but studies on cervical spinal inflammatory changes are only rarely reported and mostly rather old. Thus more data are needed from patients treated by modern methods. In this study we report the incidence of clinically significant inflammatory changes in the cervical spine in patients with PsA.

### PATIENTS AND METHODS

Patients were selected from the outpatient clinic and one ward of the Rheumatism Foundation Hospital, Heinola, Finland, during the year 2000 by studying the records and radiographs of 160 consecutive patients with PsA evincing typical psoriatic skin lesion or nail changes. Patients with inflammatory bowel disease, juvenile onset arthritis, or reactive arthritis were excluded. Sixty five patients (41%) with PsA had cervical spine radiographs available. The cervical spine radiographs had been taken because of pain or stiffness in the neck or limitation in neck movements or as preoperative routine. Lateral view cervical spine radiographs (during flexion and extension) were taken using a focus film distance of 150 cm. Cervical spine radiographs and patient records were studied.

Disease patterns of PsA were recognised as polyarthritis ( $\geq 5$  joints affected), oligoarthritis ( $< 5$  joints), or axial disease

(radiological sacroiliitis). Axial disease type also included patients with peripheral arthritis. Peripheral arthritis was diagnosed if at least one peripheral joint had been swollen or the patient had a history of previous swelling in at least one peripheral joint confirmed by a rheumatologist.

A diagnosis of anterior AAS (aAAS) was made if the distance between the anterior aspect of the dens and the posterior aspect of the anterior arch of the atlas was  $> 3$  mm. Posterior AAS (pAAS) was diagnosed if the posterior aspect of the anterior atlas arch was situated posteriorly in relation to the anterior aspect of the dens in lateral view radiographs during extension.<sup>5</sup> AAI was diagnosed by the Sakaguchi-Kauppi method, which has been developed especially for screening purposes and evaluates the position of the atlas in relation to the axis.<sup>6</sup> Subaxial subluxation of a vertebra (SAS) was diagnosed if a vertebra was displaced  $> 3$  mm in relation to the next below when measured from the posterior line of the vertebral bodies. Apophysial joint ankylosis was noted in a radiograph when fusion was seen in the joint and the position of the vertebra was unchanged during both flexion and extension. Rotational range of neck motion was evaluated as significantly decreased when it was  $\leq 45^\circ$  either to the left or the right side. Ligament calcification and syndesmophytes were not evaluated. One patient had a cervical spine radiograph taken only in flexion; she was included in the study.

### RESULTS

The most common disease type in both patient groups (with and without cervical spine radiographs) was polyarthritis (65% v 60%). The least common was oligoarthritis (17% in patients with cervical spine radiographs, but in those without radiographs, the disease was the axial type (12%).

Twelve of the 65 patients (18%) had inflammatory changes in the cervical spine. Table 1 shows the incidence of inflammatory changes. Apophysial joint ankylosis was seen solely between C2 and C3 in four patients (fig 1), between C2 and C4 in two patients, and between C3 and C4 in one (fig 2). No patients with severe AAI were seen (all three had grade II AAI). The size of aAAS was 9 mm in one patient and 4–7 mm in four. aAAS was unstable in three patients and stable in two (both of them had AAI). SAS was seen in one patient at level C3–4 and in another at C5–6 (fig 1).

In 20 of the 40 patients, who had the rotational range of neck motion measured, the measurement was  $\leq 45^\circ$  either to the left or the right side. One patient had undergone posterior spondylolysis at C1–2 because of aAAS (5 mm) and neck and occipital pain. Postoperatively no aAAS remained. No patient had neurological complications.

Thirty one per cent of patients with, and 15% of those without, cervical spine radiographs available were taking glucocorticosteroids. With sulfasalazine the proportions were 25% v 52% and methotrexate 42% v 45%, respectively.

**Abbreviations:** a (p)AAS, anterior (posterior) atlantoaxial subluxation; AAI, atlantoaxial impaction; CRP, C reactive protein; ESR, erythrocyte sedimentation rate; PsA, psoriatic arthritis; SAS, subaxial subluxation

**Table 1** Number of inflammatory cervical spine changes in radiographs of the 65 patients, shown in separate PsA patterns

Disorder	Oligoarthritis (n=11)	Axial disease (n=12)	Polyarthritis (n=42)	All No (%)
Anterior atlantoaxial subluxation (>3 mm, aAAS)		1	4	5 (8)
Posterior atlantoaxial subluxation				0
Atlantoaxial impaction (AAI)*		2	1	3 (5)
Apophysial joint ankylosis	1	3	3	7 (11)
Subaxial subluxation (>3 mm)		1	1	2 (3)
aAAS+AAI		1	1	2 (3)

\*Sakaguchi-Kauppi method, grades II-IV.<sup>6</sup>**Figure 1** Lateral view radiograph of cervical spine in flexion in a 50 year old man who has had PsA for 22 years. Anterior AAS of 7 mm and 4 mm subaxial subluxation at C5–6 level are seen. Apophysial joint fusion can be seen at C2–3.**Figure 2** Lateral view radiograph of the cervical spine in flexion showing apophysial joint ankylosis at C3–4 in a 60 year old woman who has had PsA for 27 years. Spondyloarthritis is seen at the lower level of the cervical spine.

The mean age of patients for whom cervical spine radiographs were available was at onset of PsA 38 years (range 18–65) and at radiography 49 (range 25–76) years. Their mean duration of PsA from initial arthritic symptoms to the time of cervical spine radiography was 11 years (range 1–27) and the female to male (F:M) ratio was 1.4:1. Fifty eight of the 65 patients had a Westergren erythrocyte sedimentation rate (ESR) available, with a median 24 mm/1st h (range 2–81). Serum C reactive protein (CRP) concentration was taken from 57 of the 65 patients, the median being 10 mg/l (range 0–163).

In the 95 patients with PsA (F:M ratio 1:1.1) without cervical spine radiographs available at study entry the mean duration of PsA was nine (range 0–32) years and the mean age 40 (range 16–76) years. In 79 of these 95 the median ESR was 13 mm/1st h (range 2–54) and in 77 the median CRP was 6 mg/l (range 0–46). Sixty per cent of them had polyarthritis, 28% oligoarthritis, and 12% axial disease.

## DISCUSSION

Inflammatory cervical spine changes were studied in 65/160 (41%) patients with PsA who had been treated in a rheumatological outpatient clinic and one ward. Radiographs had been taken because of neck symptoms, limitation of neck movements, or as a preoperative routine. Although cervical spine radiographs were available in only less than half of the

patients treated during the study period, we consider that this study adds useful information on patients with PsA seen by a rheumatologist, because the patients with clinical indications for cervical spine radiography are more likely to show important changes.

Most commonly these patients had polyarticular disease. Oligoarticular disease was seen less often in patients who had had cervical spine radiographs taken than in those without radiographs (17% v 28%). Patients who had cervical spine radiographs available tended to have higher ESR and CRP values than those whose cervical spine was not radiographed. This may reflect increased inflammatory activity among patients with cervical spine symptoms and need for radiography. They were also more often taking glucocorticosteroids. Blau and Kaufman have shown that patients with PsA with cervical spine changes had higher ESR levels than the patients without the changes.<sup>3</sup> In their study, patients with PsA had higher ESR levels than in our study.

The most common cervical spine change was apophysial joint ankylosis, seen in 11% of the patients. This is clearly less than seen in other studies, which have reported the incidence of apophysial joint changes in 15/75 patients (20%), 7/30 (23%), 20%, and 28%.<sup>2-9</sup> aAAS was seen less commonly here (8%) than in other studies (23% and 45%) or almost equally

often (3/30, 3/75, 5%).<sup>2,4,7-9</sup> AAI was mild and detected in 5% of patients, which is fewer than reported in a study of 28 patients (25%), but slightly more than in a study of 57 patients (2%).<sup>3,4</sup> SAS was noted in only 3% of patients. Others report SAS in 1–42% of patients with PsA.<sup>3,4,8</sup> Some of the patients had significantly limited rotational range of neck motion, but no neurological complications were seen.

Inflammatory cervical spine abnormalities were not common in the patients we studied. The size of aAAS was usually moderate and no pAAS was detected. Apophysial joint ankylosis may be more common in patients with PsA with axial disease, but to assess this with certainty would require study of a larger number of patients. The present findings confirm earlier observations that apophysial joint ankylosis is more common in patients with ankylosing spondylitis than in PsA.<sup>9,10</sup> Comparison of these results with those from patients with rheumatoid arthritis suggests that inflammatory cervical spine changes in PsA may be milder and less common than in rheumatoid arthritis, with the possible exception of apophysial joint ankylosis.<sup>11-14</sup>

In conclusion, inflammatory cervical spine changes were not commonly seen in patients with PsA. The most common changes were apophysial joint ankylosis and aAAS. None of the less clinically significant cervical spine changes do develop also in PsA.

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