

# Threefold increased risk of hip fractures with rheumatoid arthritis in Central Finland

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Table 1 Prevalence of rheumatoid arthritis (RA) in patients with hip fracture in Central Finland in 1991-93 and in the general population in Tampere 1987

Sex and age	Patients with hip fracture		Population		Relative risk (95% CI)
	Patients with RA No (%)	Total number of patients	Patients with RA No (%)	Total number of subjects	
Women:					
≤64	2 (9)	22	447 (0.7)	61 334	12.5 (3.3 to 46.9)
65-84	18 (8)	234	368 (2.5)	14 917	3.1 (2.0 to 4.9)
≥85	3 (3)	117	19 (1.5)	1 300	1.8 (0.5 to 5.8)
Men:					
≤64	1 (4)	27	134 (0.2)	57 515	15.9 (2.3 to 109.6)
65-84	3 (3)	88	81 (1.2)	6 992	2.9 (0.9 to 9.1)
≥85	2 (7)	29	2 (0.7)	285	9.8 (1.4 to 67.2)

Age and sex adjusted Mantel-Haenszel rate ratio 3.26 (95% CI 2.26 to 4.70).

## Abstract

**Objectives**—To evaluate the impact of rheumatoid arthritis (RA) on the incidence of hip fractures.

**Methods**—All patients with acute hip fractures admitted to Jyväskylä Central Hospital in 1991-93 (n=517) were selected from the hospital discharge register. Medical records of these patients were studied retrospectively for RA fulfilling the American Rheumatism Association criteria. The prevalence of RA in patients with hip fractures was compared with the prevalence rates of RA obtained from the nearby city of Tampere.

**Results**—29 (5.6%; 95% CI 3.8 to 8.0) of the patients with hip fracture in Jyväskylä Central Hospital had RA. The age and sex adjusted risk of hip fractures was increased by RA (risk ratio 3.26; 95% CI 2.26 to 4.70).

**Conclusions**—Patients with RA are at increased risk of osteoporotic hip fractures.

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Several separate health disorders have been related to increased risk of hip fractures in the elderly. The relative risk for hip fractures in patients with rheumatoid arthritis (RA) has been reported to be 1.5<sup>1</sup> and 2.1.<sup>2</sup> In Finland it has been estimated that the number of excess deaths related to the presence of RA is 400-450 a year.<sup>3</sup> Five of these excess deaths were attributed to osteoporotic fractures.

The purpose of this study was to evaluate the significance of RA as a risk factor for hip fractures in the province of Central Finland during 1991-93.

## Patients and methods

Five per cent of the population of Finland lives within the Central Finland Health Care District. In Finland there is a consensus that all patients with acute hip fractures be referred to

hospital for surgical assessment and treatment. Jyväskylä Central Hospital is the only place for referral to specialist care in this area, except in three small municipalities in the southern part of the province where the patients are partly treated in a local hospital. Those three municipalities were excluded from this study.

The mean population was calculated using data obtained from the registers of the Social Insurance Institution of Finland. The mean population of the study area was 231 697.

Patients with acute hip fractures admitted to Jyväskylä Central Hospital between January 1991 and December 1993 were selected from the hospital discharge register. To verify that no patients had accidentally been overlooked, contemporaneous records from the Department of Anaesthesiology and a hand written record of patients with hip fracture held in the traumatology ward were studied. Medical records of these patients were studied retrospectively by a specialist in internal medicine for definite or classical RA according to the American Rheumatism Association (ARA) 1958 criteria.<sup>4</sup>

The sex and age specific prevalence rates of RA among patients with hip fracture in Central Finland were compared with the rates obtained from a population based study in the city of Tampere (population 170 511) in 1987.<sup>5</sup> In Tampere the doctors' certificates of all those aged 15 years or more admitted to the special reimbursement category by the Sickness Insurance Register because of RA and allied conditions were re-evaluated by a rheumatologist using a standard protocol for the ARA criteria. All patients with definite or classical RA were studied prospectively or retrospectively and all cases with incorrect classification of the joint disease were excluded. The sex and age distributions of the population of Tampere were obtained from the official population statistics.

Mantel-Haenszel test, Student's *t* test, and the  $\chi^2$  test were used for statistical testing.

## Results

A total of 517 patients with acute hip fractures (373 (72%) women, 144 (28%) men) were admitted to Jyväskylä Central Hospital between 1991 and 1993. The mean age of the patients was 78 (range 15-99). Men were significantly younger (mean age 74) than women (mean age 80,  $p < 0.0001$ ).

Twenty nine patients with hip fractures admitted to Jyväskylä Central Hospital had definite or classical RA (5.6%; 95% CI 3.8 to 8.0). Table 1 shows the prevalence of RA in patients with hip fractures in Central Finland and in the general population in the city of Tampere.<sup>5</sup> The age and sex adjusted Mantel-Haenszel risk ratio for hip fractures in the

patients with RA was 3.26 (95%; CI 2.26 to 4.70). The relative risk was highest in the group aged  $\leq 64$ .

The mean age of the RA patients with hip fractures was 77 (range 52–91) for women and 79 (range 62–92) for men. The corresponding figures for the patients with hip fracture and no RA were 80 (range 41–99) for women and 74 (range 15–93) for men.

There were 15 (52%) cervical hip fractures and 14 (48%) trochanteric fractures among the patients with RA. The corresponding figures for patients who did not have RA were 315 (65%) for cervical fractures and 173 (35%) for trochanteric fractures ( $p=0.163$ ).

### Discussion

In Finland all patients with acute hip fractures are referred to hospital for surgical assessment and treatment. The only hospital for referral in this area with a population of 231 697 is Jyväskylä Central Hospital. Although retrospective, this study should give reliable incidence rates for hip fractures.

The diagnoses of RA were made using the medical records of Jyväskylä Central Hospital according to the ARA criteria. Jyväskylä Central Hospital is the only specialist referral centre for RA in the area. Most patients with RA should be found by this method because a certificate of a specialist is needed for the special reimbursement of drugs.

Tampere lies only 151 kilometres from Jyväskylä. The morbidity, diagnostic criteria, and treatment of RA are supposed not to be different from those of the Jyväskylä area. In the Mini Finland Health Survey<sup>6</sup> no significant differences were found in the prevalence of locomotor diseases between different parts of Finland.

A consistent 1% overall prevalence for definite or classic RA has been reported among different countries and races. In the present study 29/517 (5.6%) of patients with hip fracture had RA. It was a significant risk factor for hip fractures in men and in women. The

relative risk was highest in the age group of 64 or younger. Physical impairment and corticosteroids have been related with osteoporosis and increased risk of hip fractures<sup>1–9</sup> among patients with RA.

In this study RA was a more important risk factor for hip fractures than in earlier reports from the United Kingdom and the USA.<sup>1,2</sup> In the study in Southampton General Hospital<sup>2</sup> the relative risk for hip fractures in patients with RA was 2.1. The rate of response among controls was, however, only 71%, which may partly be responsible for the difference in the results. In Rochester, Minnesota<sup>1</sup> the relative risk was 1.5. In this study a cohort of female residents with RA diagnosed during 1950–74 was investigated in 1983. Patients with possible RA were included in the study.

We conclude that there is a threefold increased risk of hip fractures for those with RA in Central Finland.

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