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Differences in the incidence of hip fracture

Comparison of an urban and a rural population in southern Sweden

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The incidence of hip fracture from 1981 to 1984 inclusive in the urban population of the city of Malmö was compared with three rural municipalities around the city of Ystad in southern Sweden. A higher incidence of hip fracture was found in the urban population, especially among women. Patients with a hip fracture in Malmö had a lower mean age. Women in Malmö lived more often alone or in institutions.

The annual age-related increase in incidence of cervical and trochanteric fractures of the femur in urban populations is well known (Alffram 1964, Falch and Ilebekk 1978, Johnell et al. 1984, Zetterberg and Andersson 1982). A few studies have compared urban and rural populations (Reikerås et al. 1984, Falch et al. 1985, Finsen and Benum 1987, Mannius et al. 1987). The purpose of our present study was to compare the incidence of hip fractures in an urban population with that of a rural population and to describe social differences between these two population groups.

Material and methods

The number of cervical and trochanteric fractures of the femur from 1981 to 1984 inclusive was collected from the operation register at Ystad Hospital, a county hospital in southern Sweden, which serves the rural municipalities of Ystad, Skurup, and Sjöbo, and which is situated approximately 60 km east of the city of Malmö. The number of hip fractures in Malmö has been recorded continuously over the past years, and the increase in the incidence of hip fractures during the last 30 years has been reported (Johnell et al. 1984). The number of inhabitants in the four municipalities was noted from the Census Register of the County Administration in Malmö. No difference in the relative size of age-groups between urban and rural areas was found.

The background factors registered for the patients with hip fractures at Ystad Hospital were collected from the operation records, supplementary data being collected from the patient's case records. The patients with hip fractures in Malmö have been studied prospectively (Johnell and Sernbo 1986).

In order to study the social situation of old-age pensioners in general in the city and countryside, we randomly selected 100 women, 80 years old, and 100 men, 76 years old, from two locations, Malmö and Sjöbo, from the Census Register. The same author interviewed all 400 pensioners by telephone, assisted by the nursing staff of the institutions when needed. The ages of the pensioners were chosen to correspond to the average age of the patients with hip fractures (Table 1). The number of unanswered questions was less than 1 percent.

The questionnaire used in the telephone interviews concerned the pensioners' residence, whe-

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Table 1. Mean age (SD) of patients with hip fractures 1981–84

	Malmö		Ystad
	n 1,899		n 286
Men	72 (13)	$P < 0.001$	78 (10)
Women	78 (9)	$P < 0.01$	80 (9)

ther they were living alone in their own homes, were in need of assistance in their daily activity, if they could do their own shopping, and took up walking aids and medication. Two persons refused to participate in the interview.

Statistical methods were the chi-square test with Yates' correction and the Student's *t*-test.

Results

The incidence of hip fracture was lower among the rural population in men over the age of 80 and among women both in the total population served by Ystad Hospital and in Sjöbo when compared with the urban population of Malmö (Table 2). No difference was found between the mean age of patients with hip fracture in Sjöbo and in the catchment area of Ystad Hospital as a whole (Table 1). Totally, 35 percent of the men with a hip fracture in the urban area and 46 percent in the rural area were at least 80 years of age ($P < 0.05$), and 79 and 91 percent, respectively ($P < 0.01$), were over 65 years of age. In women there were no differences between the urban and rural populations, with 56 percent over 80 years of age and 92 percent over 65.

Table 2. Annual incidence of hip fractures per 1,000 inhabitants 1981–84

	Malmö		Ystad	
	Men	Women	Men	Women
≥ 65	5.6	12	4.7	7.6
		$P < 0.001$		
≥ 80 years	18	32	13	18
		$P < 0.05$	$P < 0.001$	
All	1.1	2,9	0.94	1.8
			$P < 0.001$	

Table 3. Origin of patients with hip fractures in percent

	Malmö 1983–84		Ystad 1981–84	
	Men n 269	Women n 736	Men n 97	Women n 189
Own home	66	66	61	60
Old people's home	12	14	18	28
		$P < 0.001$		
Geriatric hospital ward	19	16	12	6
		$P < 0.001$		
Other hospital ward	3	4	3	4
Uncertain residence	0	0	6	2

Two thirds of the patients had sustained their hip fracture while living at home (Table 3). There were six beds in geriatric hospitals per 1,000 inhabitants in Malmö, but only five in the Ystad area. Hip fracture patients in Malmö stayed approximately 1 month at the acute orthopedic ward, which was almost twice as long as in Ystad. Thirty-six percent of the patients with a hip fracture in Malmö compared with 25 percent in Ystad ($P < 0.05$) were discharged to geriatric hospitals. Six out of 10 patients with hip fracture were discharged to their previous residence from both hospitals.

In the municipality of Sjöbo, as well as in the catchment area of Ystad Hospital as a whole, 44 percent of the men and 60 percent of the women that sustained a hip fracture between 1981 and 1984 inclusive were living alone in their own homes at the time of fracture. The corresponding figures in the city of Malmö 1983–1984 inclusive were 47 and 71 percent, with a significant difference for women ($P < 0.05$).

The percentage of women out of the total number of patients with a hip fracture was 63 percent in the municipality of Sjöbo and 66 percent in the catchment area of Ystad Hospital between 1981 and 1984 inclusive. During the same period of time in Malmö, there were 74 percent women with a hip fracture ($P < 0.05$). The percentage of cervical fractures during 1981–1984 inclusive in the catchment area of Ystad Hospital was 46 percent among men and 50 percent among women. In Malmö there was no difference, i.e., 50 percent of the men and 51 percent of the women with a hip fracture had a cervical fracture. We found no difference in the degree of trauma between the rural and the urban population. Eight to nine out of 10 fractures were caused by a fall on the same level (Table 4), but the number of uncertain answers were 10 percent in Ystad.

Male old-age pensioners in Malmö were living in their own homes more often ($P < 0.01$), and the female old-age pensioners in the city of Malmö were living alone more often ($P < 0.001$) when compared with men and women in Sjöbo (Tables 5 and 6). With the aid of data from the Central

Table 4. Cause of trauma in patients with hip fractures in percent

	Malmö 1983–84		Ystad 1981–84	
	Men n 269	Women n 736	Men n 97	Women n 189
Fall on the same level indoors	67	77	59	73
Fall on another level indoors	4	3	1	2
Fall on the same level outdoors	18	16	21	15
Fall on another level outdoors including traffic accidents	10	3	6	2
Uncertain trauma	1	1	13	8

Table 5. Result of telephone interview of 400 old-age pensioners. Numbers are percent

	Malmö		Sjöbo	
	Men	Women	Men	Women
Residence, own home	96	90	85	93
	$P < 0.01$			
Living alone in their own own home	26	73	23	45
		$P < 0.01$		

Table 6. Statistical data

	Malmö	Ystad
Inhabitants per km^2	1,487	50
Population ≥ 65 years of age (%)	20	21
Living alone (%)	44	30
Pensioners with social home-aid (%)	19	15
Mean lifespan Men	73	74
Women	80	81

Bureau of Statistics in Stockholm, we compared the population of Sweden in general with the Malmö and Ystad populations (Table 6). The population in the city of Malmö more often lived alone and needed more social home aid.

Discussion

Our study confirms that patients with a hip fracture in the urban area more often live in their own homes (Holmberg 1985). This could reflect a lack of old people+s homes in the urban areas in Sweden. To live alone in an urban area and being a woman seems to increase the risk of sustaining a hip fracture. Women live more often alone in urban than in rural areas (Statistical reports of Folk and Bostadsräkningen 1980). The increased risk of sustaining a hip fracture when living alone has also been described by Thomas and Stevens (1974), and Ceder (1980) has pointed out that patients with a hip fracture who do not live alone are better motivated towards their physical rehabilitation after the fracture and can be discharged to their own homes earlier. Dolk and Westerborn (1977) reported that 50 percent of their patients with hip fracture were living alone. Nilsson (1984) found that 61 percent of men and 73 percent of women with trochanteric hip fractures were living alone in their own homes. According to Wild et al. (1981), "fallers" lived alone more often when compared with a control group. Sheldon (1960) and Lucht (1971) have both noticed that widows and divorced men have an increased risk of sustaining a hip fracture. The problems involved in living alone and the effect upon an elderly urban population, incapacitated by sickness, especially among men, are described by Kane and Andersen (1978). Chalmers and Ho (1970) and Suominen et al. (1984) have shown a positive relationship between bone mass and physical activity. Skog (1978) found signs that the physical activity of the rural population is greater than that of the urban population.

Our study confirms previous comparisons of the incidence of hip fractures between urban and rural populations. Reikerås et al. (1984) found that the incidence of hip fracture was twice as high in Oslo as in Troms County in northern Norway. Falch et al. (1985) found a lower incidence of hip fracture in the vicinity of Oslo than in the city itself. Mannius et al. (1987) have reported a lower incidence of hip fracture in the city than in the countryside in western Sweden, and Finsen and Benum (1987) have found similar differences in central Norway.

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