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SECULAR TENDENCIES OF THE INCIDENCE OF FRACTURE OF THE UPPER END OF THE FEMUR

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On the basis of an epidemiological study of the incidence of fracture of the upper end of the femur, undertaken in the city of Malmö for the period 1951–1960, the expected number of fractures in 1967 and 1968, and in 1974 and 1975, was calculated taking into account the changes in the size and the composition of the population. It was demonstrated that during the first period the previously described increasing trend continued so that more fractures were observed than could be expected from changes in the population only, whereas later on this trend became insignificant. The changes observed after 1968 could be explained by the increasing number of old residents in the city, and there was no obscure secular trend.

Key words: fracture; incidence; femoral neck

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Alffram (1964) found that during the period 1949–1961 the risk of femoral neck fracture increased in the city of Malmö. The increase exceeded that which could be explained by changes in the age of the population at risk; even when the increased survival age was accounted for, the number of fractures increased over the years. Mårtenson (1962), also, pointed out that the risk appeared to increase in the city of Gothenburg.

These findings suggest that an additional, so far unknown, aetiologic factor is interfering with the incidence pattern.

The objective of the present study was to continue these observations of fracture incidence up to the present time in order to decide whether or not this secular trend is continuing.

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MATERIAL AND METHODS

From the records of the Departments of Radiology and Orthopaedic Surgery, all cases of fracture of the upper end of the femur, trochanteric and cervical, in residents of the city of Malmö, were collected for the years 1967, 1968, 1974 and 1975. On the basis of the census data of the city the age and sex specific incidence of the injuries was calculated. The expected numbers of fractures for the years 1967, 1968, 1974 and 1975 were calculated on the basis of the incidence in 1951–1960 assuming that the risk had remained unchanged over the years. By calculating the expected numbers within each 10-year age group the changes in age distribution over the years were accounted for. The observed numbers were then compared with the expected by means of Poisson statistics (cf. Alffram 1964).

RESULTS

In the period 1951–1960 the average annual number of fractures of the upper end of the femur in the city of Malmö was 132. In 1967–1968 the numbers had increased to 266

and 246, respectively, and finally, in 1974 and 1975 the numbers observed were 331 and 311. There was an appreciable increase in the number of fractures. However, when the observed numbers were compared with the expected, derived from the population figures, and the numbers observed by Alffram (1964) it could be demonstrated that there was a significant continuing increase in the trend between the fifties and 1967–1968 (Figure 1). From that time on the observed number in comparison with the expected did not increase significantly. The age and sex specific incidence is demonstrated in Figure 2. There was a tendency towards a continuing increase in the incidence in the oldest age groups even during the interval 1967/68 to 1974/75. However, the very oldest patients, the octogenarians, were too few in number to contribute significantly to the rising trend, particularly the men. In women, there was a significant trend of an increasing average age at the time of fracture for both cervical and trochanteric fractures (Table 1).

Table 1. Mean age at the time of fracture

		1951–60	1967–68	1974–75
Men	Cervical	68.6	71.2	71.7
	Trochanteric	69.4	69.3	71.4
Women	Cervical	71.7	72.7	76.7
	Trochanteric	75.2	76.6	78.0

DISCUSSION

The population background for the increasing number of fractures should be considered. In the city of Malmö, over the last two decades, there has been a change in the distribution of the population, as demonstrated in Figure 3. A population peak resulting from a high birth rate at the turn of the century has advanced 20 years, which may be the basic cause of the increasing number of fractures. However, until 1968 the number of fractures in the city increased more than could be explained by the changes in the population only. There is

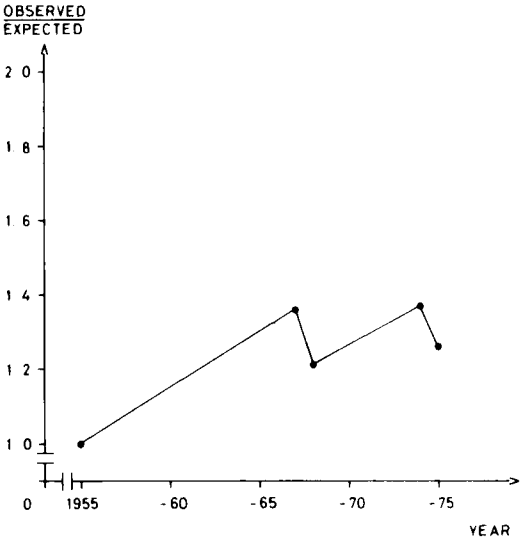

Figure 1. The relationship between observed and expected number of fractures of the upper end of the femur. Variations after 1967 are not significant.

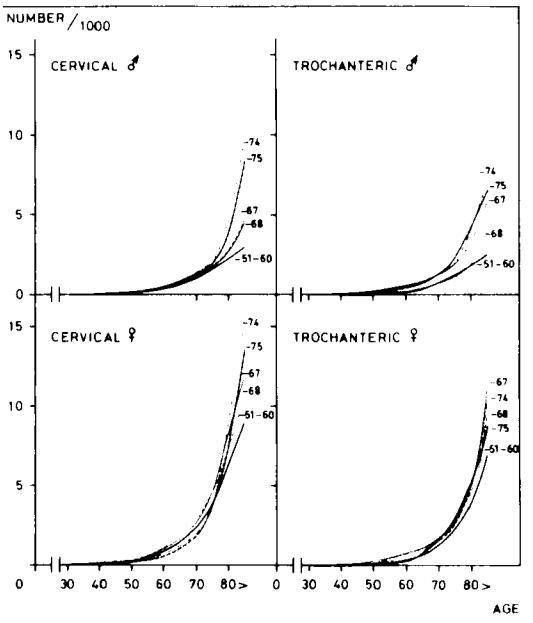

Figure 2. Age and sex specific incidence of fractures of the upper end of the femur. Note that there was an increase also during the period 1967–68 to 1974–75 in the oldest group except as regards trochanteric fractures in women. This increase was, however, not significant.

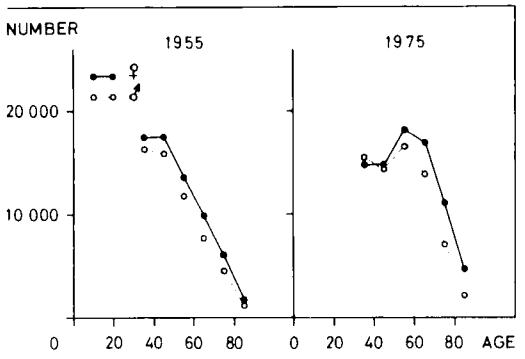

Figure 3. Population of the city of Malmö in 1955 and 1975. A peak value can be seen which is a result of migration and, possibly, a high birth rate during the second decade of this century. This population peak still has not had its full effect on the fracture pattern in the city.

no valid explanation for this. A hypothesis is that those patients, who had their fractures in the sixties, in many instances had been raised in the city of Malmö in the late phase of the industrial revolution with poverty and insufficient nutrition whereas a decade earlier, persons who then sustained fractures had mostly grown up in the country in southern Sweden and later moved to the city.

Moreover, the effects of poor nutrition in Swedish cities during the 1st World War cannot be disregarded. Alffram (1964) found that fracture of the upper end of the femur is more common in individuals born in the fall than in the spring which indicates that factors such as food and vitamin deficiencies in childhood may be of importance.

It appears as if the rising trend has been broken so that in the future the expected number of fractures may, with some accuracy, be calculated from the expected distribution of the population with regard to age and sex and that an increasing number of old residents will have the expected number of fractures and no more. It is of interest to study the incidence changes also in the future.

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