Fall frequency and incidence of distal forearm fracture in the UK

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Abstract

***Study objective* – This analysis aimed to determine the frequency of falls in men and women aged 50 years and over and to explore whether age variation in fall frequency may explain variation in the incidence of distal forearm fracture in women.**

***Design* – This was a cross sectional survey.**

***Setting* – Primary care based registers in four UK areas.**

***Participants* – Altogether 501 men and 702 women age 50–79 years participated.**

***Main results* – A total of 131 (26·1%) men and 181 (25·8%) women reported falling in the previous year. In women, the frequency of falls rose with age (χ^2 test for trend 4·33; p = 0·04), with no obvious early postmenopausal peak or subsequent decline. Men aged 50–54 years had a significantly increased risk of falls compared with women of the same age group, (odds ratio (OR) = 2·4; 95% confidence interval (CI) 1·3, 4·6), though above this age, the risk of falling was greater in women (OR = 1·2; 95% CI 0·9, 1·5).**

***Conclusions* – There are important differences in the frequency of falls in relation to age and sex. The data suggest that variation in fall frequency per se does not explain age variation in the incidence of distal forearm fracture in women.**

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The descriptive epidemiology of falls has been well characterised in elderly populations but there are few data on the frequency of falls in populations which include men and women aged less than 65 years.

Winner[1] in a postal survey of Oxford city residents reported a one year fall frequency of 12–20% in men between 20 and 85 years. In women fall frequency was similar until the perimenopausal period when it rose to 32% before falling to 21% in women in their late 60s, with a further increase after 75 years. Torgerson,[2] in a population based sample of Aberdeen women aged 45–49 years, reported a fall frequency of 14%.

In women, the incidence of distal forearm fracture increases rapidly during the early postmenopausal period and in most,[3 4] though not all series,[5] there is evidence of a plateau in incidence of fracture during the mid 60s. We have attempted to confirm whether an age variation in fall frequency may partly contribute to this observed pattern.[1]

Methods

The subjects who took part in this study were recruited from primary care based registers during the course of a large multicentre prevalence survey of vertebral osteoporosis in four UK centres (Aberdeen, Cambridge, Harrow, and Truro). Stratified random sampling was used with sex and five year age bands (50–54, 55–59, 60–64, 65–69, 70-74, 75+ years) as stratification groups. Subjects were invited by letter to attend for a spinal radiograph and an interviewer administered questionnaire. A follow up letter was sent to those who failed to attend, usually within four weeks. The overall response rate was 55% excluding those known to have died or moved house. In the four centres, a consecutive sample of approximately 76% of participants was also invited to complete a short interviewer administered questionnaire concerning falls. Subjects were asked about the occurrence of falls: "Have you fallen in the last 12 months?" and, "If Yes, how many times". These questions were based on those used in a previously validated instrument.[6]

The proportions of subjects who reported a fall in the previous year were calculated in five year age and sex bands from 50 to 79 years. Because of small numbers, individuals aged 80 years and over were excluded from the analysis.

Results

Altogether 1203 subjects age 50–79 years were recruited – 501 men (mean (SD) age 64·5 (8·0) years) and 702 women (mean (SD) age 63·8 (8·0) years). In all, 312 (25·9%) subjects reported falling in the previous year – 131 (26·1%) men and 181 (25·8%) women. Of these, 39 men (30%) and 68 women (38%) reported falling on more than one occasion. The table shows the numbers and proportions of subjects who reported any fall in the previous year in relation to age and sex group.

In women, the frequency of falls rose with age (χ^2 test for trend 4·33; p = 0·04). Men aged 50–54 years had a significantly increased risk of falls compared with women of the same age group, (odds ratio (OR) = 2·4; 95% confidence interval (CI) 1·3, 4·6) but above this age the risk of falling was slightly greater in women (OR = 1·2; 95% CI 0·9, 1·5).

Discussion

Winner suggested that changes in the risk of falling interact with osteoporosis and are partly responsible for the perimenopausal rise in the incidence of distal forearm fracture seen in women at this time and the fluctuations in

Proportions of men and women who experienced a fall in the previous 12 months (by age group).

Age group (y)	Men				Women			
	No	Falls			No	Falls		
		No	%	(SEM)		No	%	(SEM)
50–54	75	27	36	(5·5)	121	23	19	(3·6)
55–59	96	20	21	(4·1)	145	37	26	(3·6)
60–64	95	25	26	(4·5)	128	30	23	(3·7)
65–69	97	23	24	(4·3)	129	40	31	(4·1)
70–74	81	20	25	(4·8)	110	28	26	(4·2)
75–79	57	16	28	(6·0)	69	23	33	(5·7)
Total	501	131	(26)		702	181	(26)	

incidence in old age.[1] In our study, apart from minor fluctuations, the fall frequency rose gradually with age in women. There was no obvious peak incidence of falls in the early postmenopausal period or a subsequent decline. Because of small numbers within individual age strata, the data do not, however, exclude a plateau in fall frequency after 65 years, nor a rise in fall incidence in postmenopausal compared with premenopausal women, as previously suggested.[2]

Differences in absolute fall frequency between this and Winner's series may be related to methodological differences in study design, such as the use of interviewers rather than postal questionnaire increasing recall, or they may be related to lifestyle or environmental differences in the populations studied.

The response rate for participation in the study (55%) was moderate, though similar to that found in another large epidemiology study of osteoporosis conducted in the UK.[7] We analysed responses from those recruited after a first letter of invitation with those recruited after the reminder. There were no significant differences in fall frequency between these groups. This provides some evidence against serious non-response bias but does not exclude this. The main focus of this survey was osteoporosis. Because of the relationship between osteoporosis and trauma it is possible that a recent fall may have prompted participation. It is unlikely, however, that this bias would affect the younger rather than the older women, and is unlikely therefore to have influenced the age pattern of falls.

The explanation for the excess risk of falls in young men is unclear. Occupational factors are possible. Some manual occupations are known to be associated with an increased risk of falls[8] but we did not have information which would either confirm or refute this. There are few comparative data, although in a recent hospital based study in Denmark there was a slight excess of wrist trauma in men age 40–44.[9]

Although falls are clearly involved in the pathogenesis of distal forearm fracture, and fall prevention programmes are likely to have a beneficial effect on reducing fracture rates, our data suggest that variation in fall frequency per se does not explain age differences in the incidence of this fracture in women.

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