

Urinary incontinence and hip fracture

A study was undertaken to define the prevalence of nocturia and urgency in the hip fracture population immediately prior to admission to hospital and to determine the frequency that urinary problems caused the fall leading to hip fracture.

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Hip fracture is one of the most serious osteoporotic fractures, associated with up to 35%¹ mortality and 50% permanent loss in function, placing a formidable burden on healthcare resources.² The World Health Organisation recommends the identification and treatment of risk factors as a means of reducing the incidence of osteoporotic fracture.

Risk factors for fracture include low bone mass and conditions associated with falls including visual impairment, polypharmacy and urinary incontinence. Some preventative strategies are well established, particularly the pharmacological treatments for osteoporosis.^{3,4} Other problems such as locomotor and visual impairment are more difficult to address.^{5,6} Attention has been focused on the circumstances of the fall with some recommending protective undergarments and flooring.^{4,5,7,8}

Several studies have found urinary incontinence, and in particular urge incontinence, to be associated with falls and therefore, hip fracture.^{1,5,6} Nocturia has also been implicated in falls in the elderly—the suggestion being that the falls occur en route to the toilet.

We hypothesised that the urinary problems lead to the fall causing fracture and therefore that the overall incidence of hip fracture could be reduced by treatment of urinary problems. We undertook the present study to define the prevalence of nocturia and urgency in the hip fracture population immediately prior to admission and to determine the frequency that urinary problems caused the fall leading to hip fracture.

Method

A study was undertaken of all hip fractures presenting during the 12-month period from 01 July 2003 to 30

June 2004. The catchment population during the study period was estimated to be 595,591. There were 877 consecutive patients with hip fractures entered into the study. Dedicated research personnel collected all data and recorded it on a specifically designed questionnaire (Table 1) based on the International Prostate Symptom Score, a validated urological questionnaire used in both sexes.^{9,10} Data was collected from direct interviews with the patient and supplementing this information with that from their main carers and the medical notes. Data was collected at the time of admission to the orthopaedic ward. All terms were explained to the patients in language that they understood.

Nocturia was defined as having to get up more than once at night to pass urine. Urgency was defined as an episode where micturation could not be postponed.

Results

Continence in the hip fracture cohort at admission

Thirty-two patients died in hospital before data collection was completed. No information was obtained for an additional 36 patients. 47 patients had permanent indwelling urinary catheters. These 115 patients were excluded from further analyses leaving a cohort of 762. Of those able to remember (n=438), 71 (16%) were on their way to the toilet to pass urine at the time of the fall causing the hip fracture. Ten patients in this analysis were unable to give a further detailed history.

Detailed information on urinary symptoms was available in 428 patients. Of this subset, 134 (31.3%) patients experienced symptoms of urgency and 164



Box 1: Questions used to score symptoms of urgency and nocturia

Score	0	1	2	3	4	5
Over the past month, how often have you found it difficult to postpone urination	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always
Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning	None	1 time	2 times	3 times	4 times	5 or more times

(38.3%) had to get up more than once at night to pass urine.

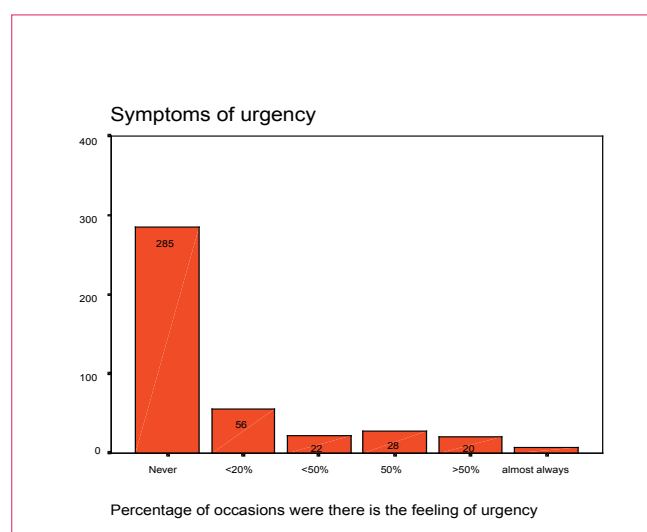
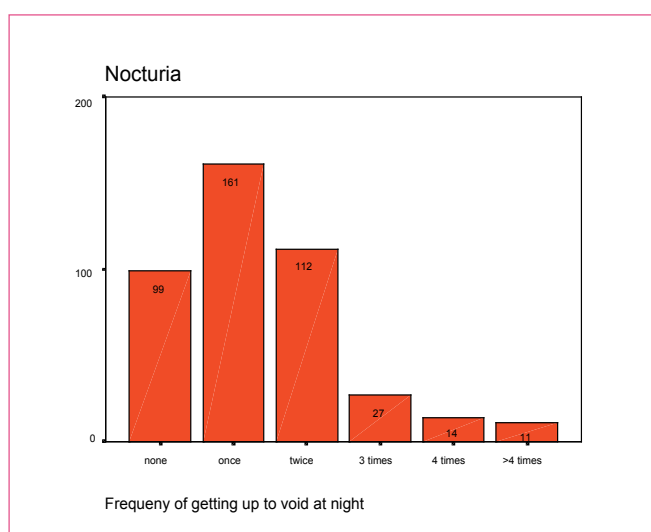
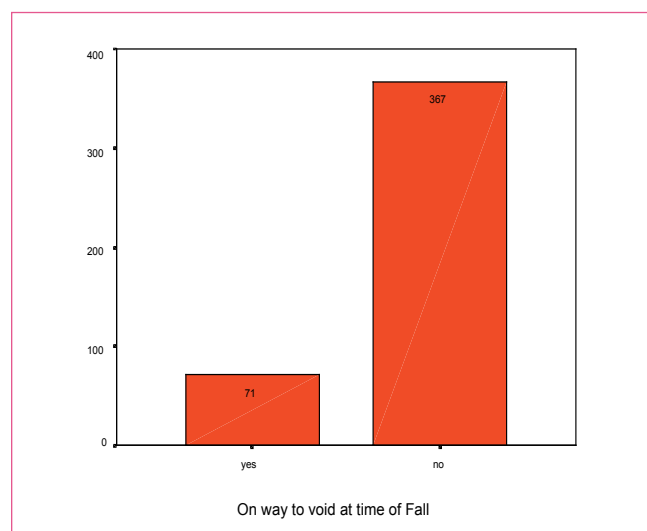
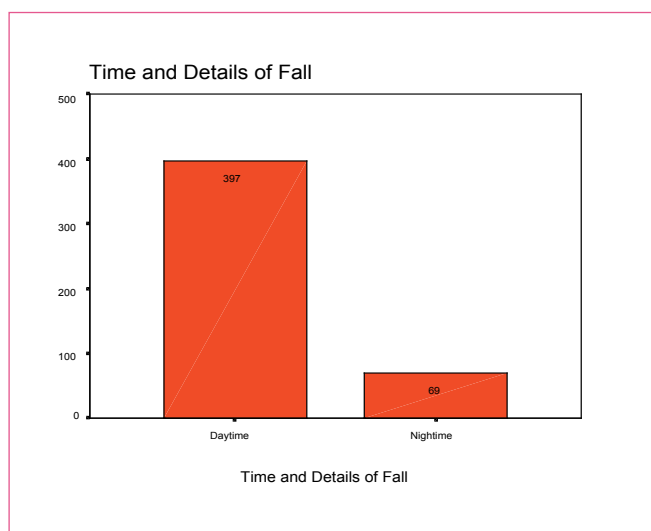
Urgency and nocturia as risk factors for hip fracture

Comparable populations were found in the literature. Tromp et al¹¹ found an incidence of urge incontinence in the community dwelling population to be 24%. In those able to give a full history (n=428), the incidence in the hip fracture population was 38.3%. This showed a statistically significant increased incidence in the hip

fracture cohort (Chi square value=9.073, p<0.01). The nocturia population was compared to that of Stewart et al¹² where the incidence of nocturia of more than once per night was 47%. This was significantly greater than that found in the hip fracture population (Chi Square=9.88, p<0.01).

Relationship of nocturia and urgency to falls

Only 11 patients with nocturia fell at night on their way to the toilet. The majority of patients with nocturia fell during the day (n=135) of which 11 were on their way



to the toilet. Of the 134 patients with any symptoms of urgency, 17 fell on their way to the toilet to pass urine. Therefore nocturia was clearly related to the fall causing the hip fracture in 1.4% and urgency in 2.2 % of the original cohort of 762 patients. Placing these figures in the context of those able to give a full, detailed urinary history, the rates were 2.5% and 4% respectively out of the subset of 428 patients.

Discussion

This study evaluated a large cohort of hip fracture patients to determine prevalence of nocturia and urgency and how frequently they were implicated in the fall causing

the hip fracture. Previous epidemiological studies on risk factors for hip fracture have consistently demonstrated an association with urinary incontinence,^{5,6} the implication being that the fall causing fracture was a consequence of getting up to pass urine. Treatment of urinary symptoms should therefore have been a rational measure to prevent hip fractures. However, in this study these problems could only be directly associated with the fall in 3.6% of the hip fracture cohort. It was therefore not possible to support our original hypothesis.

There are a number of difficulties in collecting reliable data in the hip fracture population. Most of the patients are elderly and many have some degree of cognitive impairment that may be exacerbated by the trauma.¹³ Recollection of events at the time of injury may

be imperfect in these patients. We believe this to be a problem inherent in conducting a study of this nature in this patient group.

Tromp et al¹¹ discussed the problems of questionnaire studies in an ageing population. They reviewed risk factors for falls in a population that appears similar to the patients in this study who were able to give a detailed history. The prevalence of urge incontinence amongst the community population in that study was 24% compared to 38% in the hip fracture population. The greater prevalence amongst the hip fracture population is consistent with the population studies identifying urinary problems as risk factors for fracture.

The incidence of nocturia defined as getting up more than once at night was 47% in the population reviewed by Stewart et al¹² and again their population appeared equivalent to those in this study able to provide a full history. Their study showed an increased incidence of falls but not fractures in this group. The lower incidence of nocturia (38%) among the hip population suggests that this is not a risk factor for hip fracture.

Urge incontinence is a risk factor for falls and therefore hip fracture. The importance is likely to be a marker of loss of functional independence and confidence.¹⁴ There are numerous components to this from muscle strength to sleep disturbance or psychological issues, each with separate therapeutic strategies. A preventative strategy based simply on treatment of urinary problems is not likely to be associated with a discernible decrease in the incidence of hip fracture.

Beyond the specific question of the relationship of urinary problems to hip fracture, this paper additionally highlights the need to appreciate the nature of any considered risk factor and its relationship to the index event. This is a particularly important component of any study design that aims to evaluate potential interventions.

Conclusion

This study supports the evidence from population studies that urge incontinence is a risk factor for falls and therefore osteoporotic (hip) fracture. It did not show a direct causative link. Osteoporotic fractures are a consequence of falls that have many contributory risk factors. Preventative strategies based on treatment of

urinary problems alone are not likely to be an effective way of lowering the incidence.

We have no conflict of interest

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