

IMPACT OF NOCTURIA ON FRACTURES AND MORTALITY IN OLDER POPULATION: CORRELATES WITH THE NIGHT-TIME FREQUENCY?

Hypothesis / aims of study

Nocturia is a common problem among the elderly. However, there are several reports that nocturia is an independent risk factor of fracture and high mortality for elderly population. The objective of the present study was to evaluate the association between night-time frequency and fractures and the mortality rate in a community-based elderly population.

Study design, materials and methods

We conducted a Comprehensive Geriatric Assessment of all residents who were ≥ 70 years of age in 2003 at an urban district in northern part of Japan. The population-based cross-sectional survey was conducted using an extensive health interview for each participant. We investigated the incidence of fractures and mortality over five years using the data from the national health insurance system. The cases that were relevant to fall-related fractures were abstracted from medical records of hospitals regarding the cause of fractures and the position of fracture. Differences in survival according to the night-time frequency were assessed with Kaplan-Meier curves. We compared the risk of mortality and fractures using a multivariate Cox proportional hazard model.

Results

Of the 784 Japanese people included (28.9% participation rate), 425 were female and 359 were male. The mean age was 76.0 ± 4.6 years (range: 70 to 97). Kaplan-Meier curves representing mortality are shown in Figure 1. After multivariable adjustment, the HRs (95% confidence intervals) for mortality were 1.59 (0.80-3.17), 2.34 (1.09-5.00) and 3.60 (1.38-9.35) for people who voided 2, 3 and ≥ 4 times/night compared with ≤ 1 per night (p -value for trend < 0.01 ; Table 1). The number of night-time voiding episodes was associated with a significantly increased mortality. Fractures were observed in 41 cases and fall-related fractures were observed in 32 cases. The odds ratio and 95% confidence intervals of the risk of fractures among those elderly who did or did not experience nocturia (2 times per night or more) are given in Table 2. The multivariate odds ratios (95% confidence intervals) regarding nocturia among all fractures and fall-related fractures were 2.01 (1.04-3.87, $p=0.04$) and 2.20 (1.04-4.68, $p=0.04$), respectively. However, there was no significant trend correlation between night-time frequency and fractures (Table 1).

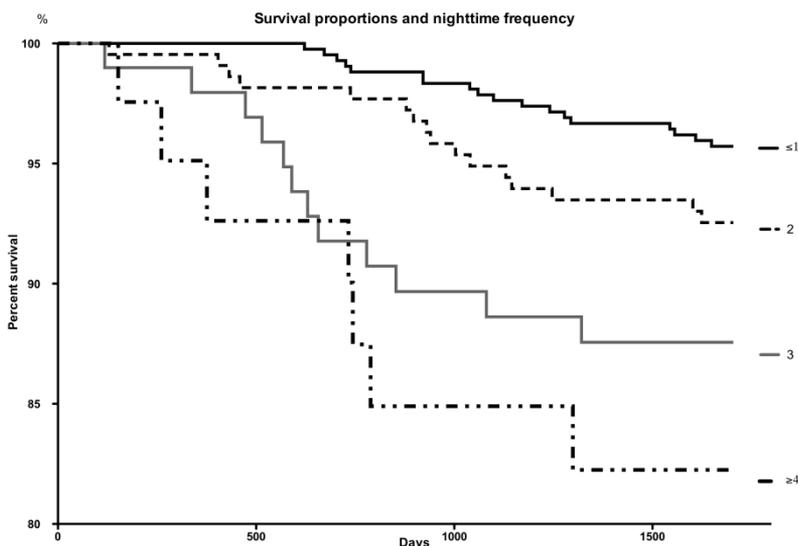


Table 1. Hazard ratios of mortality and fractures

	night time frequency				<i>p</i> for trend
	≤1 (n=425)	2 (n=219)	3 (n=99)	≥4 (n=41)	
Mortality					
No. of cases	18	16	12	7	-
Hazard Ratio (95%CI)					
Model 1*	1.00	1.59(0.80, 3.17)	2.34(1.09, 5.00)	3.60(1.38, 9.35)	<0.01
Fracture					
No. of cases	15	20	4	2	-
Hazard Ratio (95%CI)					
Model 2**	1.00	2.53 (1.27, 5.03)	1.17 (0.38, 3.58)	1.22 (0.27, 5.56)	N.S.

*Adjusted for age, sex, body mass index, diabetes, smoking status, history of coronary heart disease renal diseases, malignant disease and stroke, use of tranquilizers, hypnotics, and diuretics.

**Adjusted for age, sex, body mass index, use of tranquilizers, hypnotics, and diuretics and functional reach.

Table 2. Hazard ratios of fracture according to nocturia.

	night-time frequency		<i>p</i> value
	≤1	≥2	
All fractures			
Participants	425	359	-
No. of fracture	15	26	-
Hazard Ratio (95% Confidence Interval)			
Crude Model	1.00	2.10 (1.11-3.99)	0.02
Model 1*	1.00	2.01 (1.04-3.87)	0.04
Fall related fractures			
No. of fracture	11	21	-
Hazard Ratio (95% Confidence Interval)			
Crude Model	1.00	2.30 (1.10-4.79)	0.03
Model 1*	1.00	2.20 (1.04-4.68)	0.04

*Adjusted for age, sex, body mass index, use of tranquilizers, hypnotics, and diuretics, and functional reach.

Interpretation of results

In this study there is a significantly increased mortality associated with the night-time frequency of urination, even after adjustment for several factors. Night-time frequency has tendency to correlate nocturnal urine volume. Thus, It is possible that some underlying factors may be undiagnosed and could contribute to increased healthcare needs in nocturia. On the other hand, the correlation between the number of night-time voiding per night and prevalence of fracture was not a linear proportional correlation. This may be due to multifactorial aetiology of fracture and relatively small number of event. It is important to investigate the causes of nocturia in people reporting frequent night-time voiding. This would enable effective treatment of the condition, and in turn, lead to a reduction in fractures, improvement of patients' overall quality of life, and a reduction in the significant medical costs associated with the condition.

Concluding message

We conclude that there is a significantly increased mortality associated with the night-time frequency of urination, even after adjustment for several factors that could contribute to mortality. On the other hand, the correlation between the number of night-time frequency per night and prevalence of fracture was not a linear proportional correlation.

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Is this a clinical trial?	Yes
Is this study registered in a public clinical trials registry?	No
Is this a Randomised Controlled Trial (RCT)?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Ethics Committee Tohoku University School of Medicine
Was the Declaration of Helsinki followed?	Yes

Was informed consent obtained from the patients?

Yes
