

LOW BODY MASS INDEX IS AN INDEPENDENT POSITIVE RISK FACTOR FOR NOCTURIA.

Hypothesis / aims of study

Increased frequency of nocturnal voiding is the most bothersome symptom among lower urinary tract symptoms in Japanese men aged 40 years or older. Nocturia is a common disorder that is increasingly important as our population ages. We examined the prevalence of and risk factors for nocturia in Japan.

Study design, materials and methods

We collected data on 3624 men who participated in a prostate cancer screening program 2005 in Fukui, Japan. Nocturia was evaluated using the nocturia score of International prostate symptom score. The men were asked to report any disease that they had. Self-reported current body weight and height were used to calculate body mass index (BMI, body weight in kilograms divided by the square of height in meters).

We analyzed the relationships between nocturia (three or more voids/night) assessed by a questionnaire and other variables including age, BMI, hypertension, sleep disturbance, cardiovascular disease, cerebrovascular disease, chronic pulmonary disease, chronic hepatic disease, chronic renal failure, and diabetes mellitus (DM). In this study nocturia was defined as three or more voids per night in our study, because previous study showed the death rate of men with three or more nocturnal voiding episodes was 1.9 times that for all men studied [1]. Logistic regression model was used for statistical analysis. *P*-values <0.05 were considered statistically significant.

Results

The percent distributions of age were 20.8% for <60 years, 43.5% for 60-69 years, and 35.7% for ≥70 years. The mean age was 66.6 years (41-93 years, SD 8.3). The mean BMI was 23.2 kg/m² (13.4-35.5 kg/m², SD 2.8). The percent distributions of BMI were 4.6% for <18.5 kg/m² (Underweight), 69.9% for 18.5-24.9 kg/m² (Non-overweight), and 25.5% for ≥25 kg/m² (Overweight). Because of the relatively low percentage of the categories of persons with BMI ≥30.0 kg/m² (0.5%), the categories of BMI 25.0 to 29.9 and ≥30 kg/m² were combined in this study.

Overall, the prevalence of nocturia was 13.6%. The age-specific overall prevalence of nocturia were 4.8% for <60 years, 9.9% for 60-69 years, and 23.3% for ≥70 years, with an increasing proportion in older groups. Moreover, underweight men had more frequent nocturnal voids in ≥70 years groups (Figure).

Figure. Prevalence of nocturia (three or more voids/night) of 3624 Japanese men.

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In the multivariate analysis a significant association was found between nocturia and the following diseases: age (60-69y: OR 2.0, CI 1.4-3.0, ≥70y: OR 5.1, CI 3.5-7.3), BMI <18.5 (OR 1.7, CI 1.1-2.5), sleep disturbance (OR 1.9, CI 1.7-2.4), cardiovascular disease (OR 1.7, CI 1.2-2.3), cerebrovascular disease (OR 1.7, CI 1.1-2.7), and hypertension (OR 1.3, CI 1.0-1.6). Other variables were not associated with nocturia (Table).

Table. Multivariate analysis of risk factors for nocturia (three or more voids/night)

	Odds ratio	95% CI	p-value
Age 60-69 y	2.0	1.4-3.0	0.0004
≥70 y	5.1	3.5-7.3	<0.0001
BMI <18.5 (underweight)	1.7	1.1-2.5	0.0081
≥25.0 (overweight)	-	-	0.6422
Sleep disturbance	1.9	1.7-2.4	0.0063
Cardiovascular disease	1.7	1.2-2.3	0.0029
Cerebrovascular disease	1.7	1.1-2.7	0.0291
Hypertension	1.3	1.0-1.6	0.0253

Chronic pulmonary disease	-	-	0.7503
Diabetes mellitus	-	-	0.6039
Hepatic disease	-	-	0.6281
Renal disease	-	-	0.5849

95%CI= 95% Confidence Intervals, BMI= body mass index

Interpretation of results

We showed age exhibited the strongest impact on the prevalence of nocturia in Japanese elderly men, which was consistent with the findings from previous studies.

Interestingly, being underweight had a positive impact on nocturia among Japanese men. Previous studies found that obesity was related to nocturia or lower urinary tract symptoms in Western country [2]. Because of the relatively low percentage of the categories of persons with BMI <18.5 kg/m², the categories of underweight (BMI <18.5) and non-overweight weight (BMI 18.5-24.9) were combined in those studies. These differences of BMI distribution among countries or races may explain our findings.

It has been reported recently that high BMI was associated with increased risk of coronary heart disease, sleep apnea, and DM, whereas low BMI was associated with intraparenchymal hemorrhage, sleep apnea, and DM for Japanese, unlike many studies in the Western countries [3]. Not only high BMI but also low BMI may be a marker for increased risk of various diseases including nocturia.

Concluding message

Our study showed being underweight is an independent positive risk factor for nocturia. Because nocturia is associated with various factors, multiple approaches are needed to the treatment of patients with nocturia.

References

1. BJU Int (1999) 84; 297-301.
2. Am J Epidemiol (2006) 163; 1003-1011. .
3. Stroke (2005) 36; 1377-1382.

FUNDING: None

HUMAN SUBJECTS: This study was approved by the the ethical committee of University of Fukui and followed the Declaration of Helsinki Informed consent was obtained from the patients.