

THE INFLUENCE OF SLEEP TIME ON NOCTURIA ; AN ANALYSIS OF FREQUENCY VOLUME CHART

Hypothesis / aims of study

Nocturia is one of the most common and bothersome lower urinary tract symptoms and associated with decreased quality of life and impaired health condition. It is also well known that nocturia is a major cause of sleep disturbance; however, the relationship between sleep disorders and nocturia has not been well understood. The purpose of this study was to analyze the data obtained from frequency-volume charts (F-V charts) and investigate the influence of sleep time on nocturia.

Study design, materials and methods

This study evaluated the F-V charts of 694 subjects including community dwelling people who underwent mass-screening program in a rural town and outpatients who visited our clinic in Japan. Among them, 184 participants who did not consent to the study or whose data were insufficient for evaluation were excluded from the study and totally 510 subjects (178 males and 332 females) were analyzed. Clinical variables such as the number of voids (day and night), urine volume (24-hour, diurnal and nocturnal), largest voided volume (day and night), sleep time, nocturnal polyuria index (rate of nocturnal urine volume/24-hour urine volume) and rate of nocturnal urine production were obtained from the charts. For statistical analysis, univariate analysis using Spearman correlation coefficient and multiple regression analysis were performed to determine which variable was independently associated with the number of nighttime voids.

Results

Age distribution of the 510 subjects ranged from 39 to 90 years old (mean 64 years old). Among these subjects, 192 (38%) had one void, 62 (12%) had 2 voids and 36 (7%) had 3 or more voids during sleeping. Uni-variate analysis with Spearman correlation coefficient was performed between the number of night time voids and 10 variables such as age, sex, 24-hour urine volume, nocturnal urine volume, nocturnal polyuria index, daytime largest voided volume, nighttime largest voided volume, sleep time and rate of nocturnal urine production. Age ($rS=0.46$), nocturnal polyuria index ($rS=0.55$), sleep time ($rS=0.43$) and rate of nocturnal urine production ($rS=0.39$) were associated with the number of nighttime voids. Multiple regression analysis was performed between nighttime voids and the same 10 variables and age ($p<0.0118$), 24-hour urine volume ($p<0.0001$), nocturnal urine volume ($p=0.024$), nocturnal polyuria index ($p<0.0001$), number of daytime voids ($p<0.0001$), night time largest voided volume ($p<0.0001$) and sleep time ($p=0.011$) were independently associated with the number of nighttime voids. Stepwise multiple regression analysis also showed that sleep time was an independent factor of nocturia. Same results were obtained in the analyses in only men, women, and the subjects older than 64 years old.

Interpretation of results

Coyne et al performed a multi-variate analysis using the covariates such as age, gender, clinical conditions such as diabetes mellitus, heart failure, central nervous system disorder, interstitial cystitis, use of diuretics etc and urinary symptoms such as number of frequency, urinary urge intensity, and incontinence episode obtained through telephone interview and revealed that the number of nocturia episodes/night was significantly associated with the number of hours of sleep/night[1]. However, the variables analyzed by Coyne et al seem to be more ambiguous than those obtained from frequency volume chart in our study. To our knowledge, this is the first study to report that long sleep time is an independent risk factor of nocturia compared with the clinical factors such as 24-hour urine volume, nocturnal urine volume, nocturnal polyuria index, daytime largest voided volume, night time largest voided volume, sleep time and rate of nocturnal urine production.

Concluding message

Sleep time seems to be closely related to nocturia. Physicians should take sleep time of the patients into consideration in the evaluation and treatment of nocturia.

References

1. BJU Int 2003;92:948 - 954

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HUMAN SUBJECTS: This study was approved by the the Ethical Committee of Meiji University of Oriental Medicine and followed the Declaration of Helsinki Informed consent was obtained from the patients.