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HUS SHOULD BE SECURED MORE THAN 3 HOURS IN TREATMENT OF NOCTURIA: EXAMINATION OF RELATIONSHIPS BETWEEN NIGHT URINATION FREQUENCY AND QUALITY OF SLEEP.

Hypothesis / aims of study
Hours of undisturbed sleep (HUS) is an indicator of sleep condition. When HUS shortens in night micturition or other factors, good quality sleep shortens, and quality of life (QOL) may be affected. However, it is a fact that there are patients who are not troubled even if they get up many times in the night micturition. So we examined relationships between night urination frequency and sleep time, quality of sleep and life, using a questionnaire.

Study design, materials and methods
We examined 1102 male patients (49-93 years old, mean 74.4 years old) who received a medical examination from our department for one year from February, 2014, and agreed to answer a questionnaire. We use International Prostate Symptom Score (IPSS), the Japanese version of the Nocturia Quality of Life (N-QOL) and an original questionnaire which we revised Pittsburg Sleep Quality Index (PSQI) for the questionnaire.

Results
Mean sleep time was 8 hours 22 minutes, which was longer than the time for need at the age. Mean HUS was 3 hour 38 minutes and mean night urination frequency was 2.2 times. 54% of the patients had some trouble in urination. People who had dysuria were worse at IPSS (Dysuria: 14.5 ± 6.9 vs No Dysuria 9.7 ± 2.3, $p<0.05$), N-QOL (70 ± 20.6 vs 80 ± 15.7, $p<0.05$) and Feeling of the waking (2.5 ± 0.8 vs 2.3 ± 0.7, $p<0.05$) than people who had no trouble in urination. Patients who had the trouble also got up many times in the night for urination (2.6 ± 1.3 times vs 1.9 ± 1.1 times, $p<0.05$) and had shorter HUS (3 hours 14 minutes ± 92 minutes vs 3 hours 59 minutes ± 127 minutes, $p<0.05$). We divided patients into two groups by HUS; less than 3 hours (<3hrs) and more than 3 hours (≥3hrs). More than 3hours group was better at each of score, QOL score (<3hrs: 3.35 vs ≥3hrs: 2.41, $p<0.001$), N-QOL (69.6 vs 79.5, $p<0.001$), and Feeling of the waking (2.58 vs 2.29, $p<0.001$, 1: very good to 5: very sleepy). We also divided 1037 patients who woke up for urination more than one time into two groups by QOL score; less troubled group (QOL score: 0-3) and more troubled group (4-6). HUS in less troubled group was longer than more troubled group (3 hours 33 minutes vs 2 hours 47 minutes, $p<0.001$). Even we divided the patients into two groups by N-QOL. N-QOL ≥70 points group and <70 points group. And the results was similar to the result of QOL score (HUS in N-QOL ≥70 points group: 3 hours 29 minutes vs <70 points group: 2 hours 56 minutes, $p<0.001$). We also made multiple regression analysis about factors of night urination frequency. It depended on Age, Storage symptoms score of IPSS, Sleep time and shorten HUS ($p<0.001$).

Interpretation of results
It is suggested that there is a relevant to HUS, nocturia and quality of sleep, and that there are some cases who wake up many times in night micturition, because of too long sleep. At the cases, if HUS were secured for long time, they would not be troubled so much. For the quality of sleep, depth of sleep is more important than length. Deep sleep, which is also called non-rapid eye movement (non-REM) sleep is appeared within 3 hours from sleep onset. Getting sleep at this time zone is important for maintaining good sleep hygiene.

Concluding message
In performing the treatment of nocturia, it is necessary that sleeping state, especially HUS are checked and evaluated, and patients should receive drug treatment and/or life style guidance in order to get HUS more than 3 hours and maintain quality of sleep.

Disclosures
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