NOCTURIA IS ASSOCIATED WITH THE INCIDENCE OF METABOLIC SYNDROME: A FOUR-YEAR LONGITUDINAL STUDY IN JAPANESE MEN AND WOMEN.

Hypothesis / aims of study
Few studies have investigated the association between nocturia and the incidence of metabolic syndrome (MetS). We hypothesized that nocturia may be associated with the incidence of MetS and conducted a 4-year longitudinal study that investigated the possible association.

Study design, materials and methods
We collected data on 5,701 individuals who participated in a multiphasic health screening in Fukui, Japan, in 2003 (baseline) and 2007, and were ≤65 years at baseline. After excluding participants with MetS at baseline, data from 5,234 participants (1,173 men and 4,061 women) were subjected to analysis.
MetS diagnoses were made using the modified Japanese criteria, in which MetS was diagnosed when obesity plus two or more of the following criteria were present: HDL cholesterol <40 mg/dL or triglycerides ≥150 mg/dL; systolic blood pressure ≥130 mmHg, diastolic blood pressure ≥85 mmHg, or on therapy; and fasting plasma glucose ≥110 mg/dL, or in therapy. Obesity was defined as a body mass index ≥25.0 kg/m². Waist circumference was not included in the definition of obesity because this measurement was not available in this study. Subjects were considered to have MetS if they were taking medication for hypertension, hypercholesterolemia, hypertriglyceridemia or diabetes mellitus. Nocturia was defined as two or more voids/night (experienced “sometimes” or “always”).

The relationship between nocturia and the incidence of MetS was analyzed using logistic regression modeling. P-values <0.05 were considered statistically significant.

Results
The participants’ mean age was 55.6 years (range, 23-65 years) at baseline. The overall prevalence of nocturia was 6.2% at baseline and was higher in older age groups. A total of 210 participants (4%) developed MetS during the four-year study period.

After adjusting for age and gender, a significant association was observed between the incidence of MetS and nocturia (experienced “sometimes” or “always”). For the incidence of MetS, the multivariate odds ratios (95% Confidence Intervals) of “sometimes” and “always” nocturia were 2.31 (1.14-4.72) and 2.90 (1.08-7.87), respectively (Table).

Interpretation of results
The results of our study indicate that the incidence of MetS is associated with nocturia. In previous studies, the components of MetS, such as obesity, diabetes, and hypertension were risk factors for nocturia [1-3]. The components of MetS are not mutually exclusive and could interact with each other. Therefore, nocturia may increase during the progression of MetS or MetS components. As such, nocturia may also be a marker for the incidence of MetS.

Concluding message
The results of our epidemiological study indicate that nocturia can be a precursor of MetS. Therefore, clinicians may need to consider MetS and its other precursors in the differential diagnosis of nocturia.

Table. Multivariate analysis of risk factors for the incidence of metabolic syndrome in Japanese men and women.

<table>
<thead>
<tr>
<th></th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.03</td>
<td>1.01-1.05</td>
<td>&lt;0.01</td>
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<tr>
<td>Gender</td>
<td>Male/Female</td>
<td>2.52</td>
<td>1.89-3.34</td>
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<tr>
<td>Nocturia</td>
<td>“None”</td>
<td>1 (ref.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Sometimes”</td>
<td>2.31</td>
<td>1.14-4.72</td>
</tr>
<tr>
<td></td>
<td>“Always”</td>
<td>2.90</td>
<td>1.08-7.87</td>
</tr>
</tbody>
</table>

*95%CI, 95% Confidence Intervals.

References

Disclosures
Funding: This work was supported by JSPS (Japan Society for the Promotion of Science) KAKENHI Grant Number 23592360.
Clinical Trial: No
Subjects: HUMAN
Ethics Committee: The Ethical Committee of The University of Fukui
Helsinki: Yes
Informed Consent: Yes