The correlation between OAB symptoms and the urine NOx and the serum NOx in middle-aged and elderly community-dwelling men and women

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Objectives

It is supposed that bladder ischemia is associated with detrusor overactivity (1). To monitor the extent of damage of bladder ischemia, reliable noninvasive measurement is needed. We have revealed that the serum nitrite plus nitrate (NOx) levels in the women with OAB without urge urinary incontinence (OAB-Dry) was significantly lower than those of the women without OAB (2). On the other hand, it is described that the decreased urine NOx levels were associated with hypertension (3).

The aims of this study are to assess whether the urine NOx levels and the serum NOx levels are related to OAB symptoms in community-dwelling men and women in Japan.

Materials & Methods

- A total of 189 subjects (80 men and 109 women, mean 66.8 years) were recruited for the purpose of a mass-screening program for general health in a community-based study in Japan.
- All participants were asked to complete questionnaire to assess OAB using Overactive Bladder Symptom Score (OABSS). OAB was defined as both Q2≥2 (one or more urgency episodes per week) and total score ≥ 3. And furthermore, the symptoms were confirmed by medical interview.
- Intima media thickness (IMT) of the carotid arteries was measured by ultrasonography due to discriminate atherosclerotic lesion. The presence of atherosclerosis was defined as the averaged IMT>1.1 by calculation of the bilateral IMT in each subject.
- Urinary NOx levels were assayed by using a commercial ELISA kit. Serum NOx levels were measured using a commercial EIA kit.

Results

- Thirty-three subjects (17.4%) had OAB symptoms, including 25 (13.2%) without urge incontinence (OAB-Dry), and 8 (4.2%) with urge incontinence(OAB-Wet). Table 1 shows the relationship between atherosclerosis and OAB. There was no statistically significance (p=0.18).
- The serum NOx levels significantly increased with age (r=0.24, p=0.001) and averaged IMT (r=0.23, p=0.002) in all subjects. While, the urine NOx levels did not change compared with age (r=-0.11, p=0.13) and averaged IMT (r=-0.006, p=0.93).
- In all subjects there were statistically significant positive correlations between the urine NOx levels and the serum NOx levels (r=0.48, p<0.0001). (Fig. 1)
- In the subgroups of the subjects with OAB-Dry statistically significant positive correlations were observed between the urine NOX levels and the serum NOx levels (r=0.72, p<0.0001). (Fig. 2)
- In subgroup of the subjects with OAB-Dry statistically significant positive correlations were observed between the urine NOX levels and the serum NOx levels (r=0.56, p=0.004). (Fig. 3)
- In contrast, in subgroup of the subjects with OAB there were statistically significant negative correlations between the urine NOX levels and the serum NOx levels (r=-0.76, p=0.03). (Fig. 4)

Table 1 Relationship between arteriosclerosis and OAB

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<thead>
<tr>
<th>Arteriosclerosis</th>
<th>OAB (%)</th>
<th>OAB (-)</th>
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<tr>
<td>OAB (-)</td>
<td>15 (8%)</td>
<td>18 (10%)</td>
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| OAB (+)         | 93 (49%)| 63 (33%)| 0.18

Conclusions

- The results of this study suggest that the lower urinary NOx levels may be accompanied with the greater serum NOx levels in the subjects with OAB-Wet.
- Evaluation of the urinary NOx levels and the serum NOx levels could contribute as biomarker that represents an advanced stage in the pathophysiology of OAB due to ischemic bladder.

References