

## THE CORRELATION BETWEEN SERUM NITRITE PLUS NITRATE (NOx) AND OVERACTIVE BLADDER IN MIDDLE AGED AND ELDERLY COMMUNITY-DWELLING WOMEN

### Hypothesis / aims of study

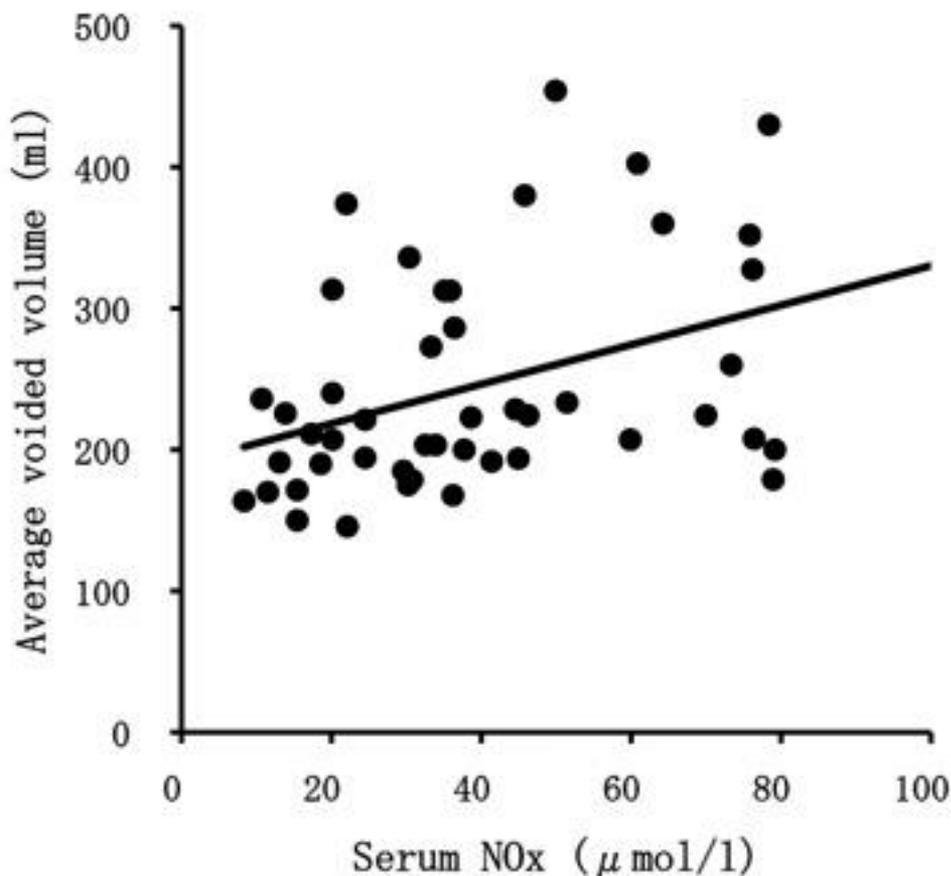
We have reported that the serum adiponectin level, which is a serum biomarker of metabolic syndrome, in the OAB women with metabolic syndrome was significantly lower than that in the healthy women and the serum adiponectin level in the OAB with urge urinary incontinence (UUI) women had significant linear correlation to the average voided volume (AVV) (1). In addition to the serum adiponectin level, the serum nitrite plus nitrate (NOx) level is known as a biomarker correlated with components of the metabolic syndrome (2). Nitric oxide (NO) has also been recognized as an important neurotransmitter in the lower urinary tract. However, the relationships between these factors and overactive bladder (OAB) symptoms remain unclear. Aims of this study are to assess whether the serum NOx levels are related to OAB symptoms and the variables obtained from bladder diaries in community-dwelling women of 40 yr of age or older in Japan.

### Study design, materials and methods

A total of 345 women (mean 63 years old, range 40 to 84) were asked to complete 3-day bladder diary and questionnaires to assess OAB (OABSS) (3) OAB syndrome was defined using standardized symptom indicators. Serum NOx levels was measured by using a commercial EIA kit. The subjects with OAB were abstracted from the medical interview at the time of the mass-screening program by a definition of OAB of eight or more voids per day and one or more urgency episodes per week, as described in a previous epidemiological study in Japan.

### Results

Of the 345 women, 92 (26.6%) had OAB symptoms, including 55 (15.9%) without urge incontinence (OAB-Dry), and 37 (10.7%) with urge incontinence (OAB-Wet). The serum NOx levels significantly increased with age in all subjects. As for the bladder diary parameters in the OAB-Dry women, the serum NOx levels had significant linear correlation to the average voided volume ( $r=0.40$ ,  $p<0.001$ ) (Figure 1). Out of 55 women with OAB-Dry, there were significant differences in the serum NOx levels between the women with  $AVV<200$  and those with  $AVV>200$  ( $p=0.01$ ) (28.1 vs. 44.2  $\mu\text{mol/l}$ , respectively). The serum NOx levels of the women in the OAB-Dry group (41.2  $\mu\text{mol/l}$ ) was significantly lower than that in the OAB-Wet group (55.4  $\mu\text{mol/l}$ ) ( $p<0.05$ ).



### Interpretation of results

This study suggests significant linear correlation between the average voided volume and the serum NOx level, and also suggests the significantly lower serum NOx level in the women with OAB-Dry in comparison to those with OAB-Wet. The evaluation of the serum NOx levels could contribute as a biomarker of OAB that represents earlier stage in its pathophysiology. The serum NOx levels are potential novel target for the prevention and/or treatment of OAB.

### Concluding message

There was significant linear correlation between the average voided volume and the serum NOx level, The serum NOx level in the women with OAB-Dry group was significantly less than that in the women with OAB-Wet group.

### References

1. J Urol, 181(4): 674, 2009.
2. Environ Health Prev Med,13(1): 36, 2008.
3. Urology, 68(2):318, 2006.

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|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b><i>Specify source of funding or grant</i></b>               | <b>None</b>                                                                                                         |
| <b><i>Is this a clinical trial?</i></b>                        | <b>No</b>                                                                                                           |
| <b><i>What were the subjects in the study?</i></b>             | <b>HUMAN</b>                                                                                                        |
| <b><i>Was this study approved by an ethics committee?</i></b>  | <b>Yes</b>                                                                                                          |
| <b><i>Specify Name of Ethics Committee</i></b>                 | <b>Ethical Committee of Meiji University of Integrative Medicine and<br/>Ethical Committee of Nagoya University</b> |
| <b><i>Was the Declaration of Helsinki followed?</i></b>        | <b>Yes</b>                                                                                                          |
| <b><i>Was informed consent obtained from the patients?</i></b> | <b>Yes</b>                                                                                                          |