

ASSOCIATION OF SERUM NITRIC OXIDE (NO) LEVEL WITH SEVERITY OF OVERACTIVE BLADDER IN MIDDLE AGED AND ELDERLY COMMUNITY-DWELLING WOMEN

Hypothesis / aims of study

Nitric oxide (NO) is an inorganic free radical gas synthesized by the oxidation of L-arginine in a process catalyzed by nitric oxide synthase (NOS). NO has been recognized as an important neurotransmitter in the lower urinary tract. On the other hand, metabolic syndrome has become increasingly prevalent in the developed countries of the world. Recently, it was reported that an increase in the clustering of metabolic syndrome components was associated with the increase in serum NO levels in our general population (1). However, no data are available on the association between the circulating NO level and overactive bladder (OAB) in a general population.

The aim of this study was to assess the relationship between serum NO levels and OAB symptoms in community-dwelling women 40 years of age or older examined during a mass-screening program 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 with grade of bladder perception, IPSS, ICIQ-SF, and OAB Symptom Score (OABSS) on community-based study in Japan (2). Serum NO levels were measured using a commercial kit in all subjects. 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 (3). 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 other 253 women were classified as the Normal group. The mean ages were 61.6 years in the Normal group, 63.8 in the OAB-Dry group and 69.6 in the OAB-Wet group. The age of the women with OAB-Wet group was significantly older than other groups ($p < 0.01$). The average voided volume in the women with OAB-Wet (204.8 ± 74.0 ml) was significantly smaller than that in those with OAB-Dry (245.0 ± 78.5 ml, $p = 0.015$) and with Normal (250.1 ± 74.0 ml, $p = 0.001$).

Results

The serum NO level was significantly higher in the women with OAB-Wet group ($55.4 \pm 39.5 \mu\text{mol/l}$) than the women with OAB-Dry group ($41.2 \pm 24.5 \mu\text{mol/l}$; $p < 0.05$). However, there were no significant differences between the women with OAB-Dry group and the women with Normal group ($46.0 \pm 33.8 \mu\text{mol/l}$). (Figure 1) The serum NO levels significantly increased with age ($r = 0.64$, $p < 0.001$). Regression analysis revealed significant positive correlations of the serum NO levels with the "slow stream" in IPSS (F value = 5.0, $p < 0.001$), "sense of residual urine" in IPSS (F value = 4.7, $p = 0.03$), and "nocturia" in IPSS (F value = 4.7, $p = 0.03$).

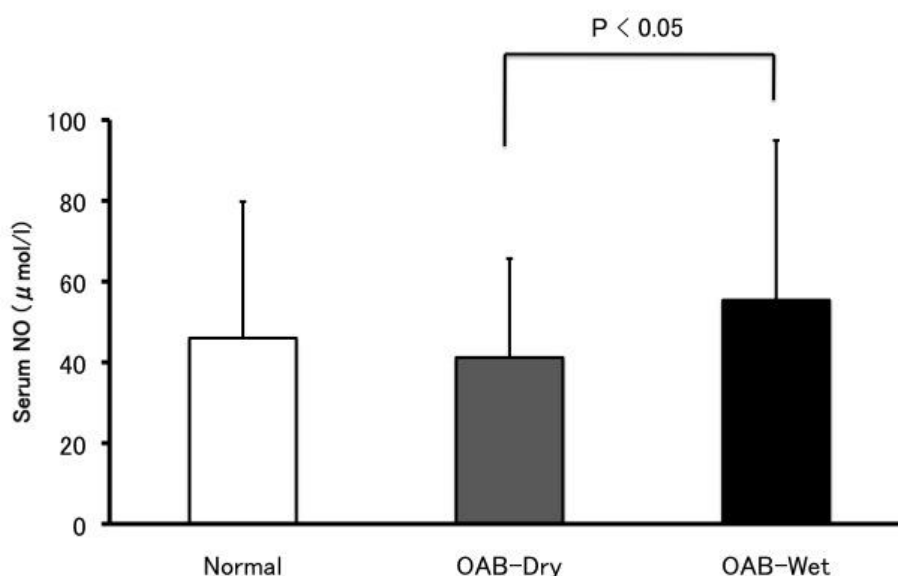


Figure 1 Serum NO level among the three groups

Interpretation of results

In the relationship between the serum NO levels and OAB, the significantly increased serum NO levels were found in the women with OAB-Wet group compared with OAB-Wet group. Additionally, the serum NO levels significantly increased with age. In these results, increased serum NO levels might be associated with the dysfunction of NO. The serum NO level is potential novel target for the prevention and/or treatment of OAB.

Concluding message

Our community-based study suggests the significantly higher serum NO level in the women with OAB-Wet group in comparison to the women with OAB-Dry group. Serum NO level might be associated with severity of OAB.

References

1. Environ Health Prev Med, 13: 36, 2008
2. Urology, 68: 318, 2006
3. BJU Int, 96: 1314, 2005

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