

## INVESTIGATION IN THE RELATIONSHIP BETWEEN VITAMIN D AND FEMALE URINARY INCONTINENCE

### Hypothesis / aims of study

Purpose of this study was to survey the prevalence of vitamin D deficiency in women with urinary incontinence (UI), and to investigate the potential relationship between vitamin D status with UI.

### Study design, materials and methods

A cross-sectional study was performed at a physical examination center between March 2014 and April 2014. There were 725 woman enrolled to this study. Validated questionnaires Incontinence Quality of Life (I-QoL) questionnaire were used. Blood serum detected vitamin D level in every woman. Multivariable logistic regression models compared vitamin D levels as a multi-category variable or as a continuous variable. 95% confidence intervals (CI) and odds ratios (OR) were calculated to evaluate relationship between serum vitamin D levels and UI adjusted for known confounding factors.

### Results

48 women were excluded due to missing clinical or questionnaire data. Therefore, 677 women were available for the final statistical analysis. The characteristics of the subjects are shown in Table 1. The mean age of the participate was 43.1±12.9 years. The incidence of UI (n=137) was 20.2%. The mean vitamin D level was 14.2±6.7ng/ml. Among all subjects, 160(23.6%) were severe vitamin D deficiency, 385(56.9%) were mild vitamin D deficiency, 99(14.6%) were vitamin D insufficiency, 33(4.9%) were vitamin D sufficiency.

Among 677 women, serum vitamin D levels were lower in the UI group than the non-UI group (14.94±7.87ng/ml vs. 16.61±8.07 ng/ml, p=0.003). In the UI group, the prevalence of vitamin D severe deficiency, mild deficiency, insufficiency were 39(28.5%), 73(53.2%), 18(13.1%) respectively. In adjusted multivariable logistic regression models, after adjustment for age, BMI, education, delivery mode, menopausal status, blood pressure, smoking history and diabetes mellitus, serum vitamin D levels were inversely associated with UI (OR, 0.946; 95% CI, 0.916-0.978); When we assessed vitamin D levels as a multi-category variable, the likelihood of UI were significantly reduced in vitamin D levels 10 to 19.9ng/ml (OR, 0.597; 95% CI, 0.369-0.967) and 20 to 29.9 ng/ml (OR, 0.359; 95% CI, 0.178-0.727) compared with patients with levels less than 10 ng/ml.

### Interpretation of results

Low vitamin D levels were highly prevalent. In our study, serum vitamin D levels in UI group were significant lower than that in non-UI group. Studies in animal models and human bladder cell lines have suggested that the activity of vitamin D receptor agonists is to modulate bladder smooth muscle function and prevent negative functional changes that may occur with bladder outlet obstruction.

### Concluding message

Vitamin D deficiency is associated with increased risk of female urinary incontinence. UI women with vitamin D-deficient needs further consideration.

### Disclosures

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