262

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IMPAIRED BLADDER EMPTYING IN GERIATRIC PATIENTS: CLINICAL SIGNIFICANCE OF THE EVALUATION OF PHYSICAL MOBILITY

Hypothesis / aims of study

Urinary incontinence (UI) is a common problem in the elderly, and low physical mobility (PM) has been reported as a risk factor for UI. However, few studies have attempted to determine whether low PM is associated with impaired bladder emptying. In this study we investigated PM-related changes in bladder emptying by uroflowmetry (UFM) and post void residual urine volume (PVR) measurements.

Study design, materials and methods

All 273 non-urological inpatients at Noto General Hospital (101 males and 172 females) with an indwelt urethral catheter treated between July 2008 and August 2009 were enrolled in this study. Bedridden patients were excluded. Physical examinations, prostate volume measurements in men, UFM in a sitting position, and PVR measurements were performed at the time the catheter was removed. Patients were divided into 3 groups, as follows, based on the category of “help needed with toilet use” in the Berthal index: Group (G)1: Independent, G2: A little help is required, G3: A lot of help is required. Maximum flow rate (Qmax), average flow rate (Qave), voided volume (VV), and PVR were compared using Student’s t-test. We also investigated the risk factors for PVR of 50 ml or more, including age, sex, PM, and pre-existing diseases (cerebrovascular disease, dementia, diabetes mellitus (DM), spinal cord injury, and pelvic operation) by logistic regression analysis.

Results

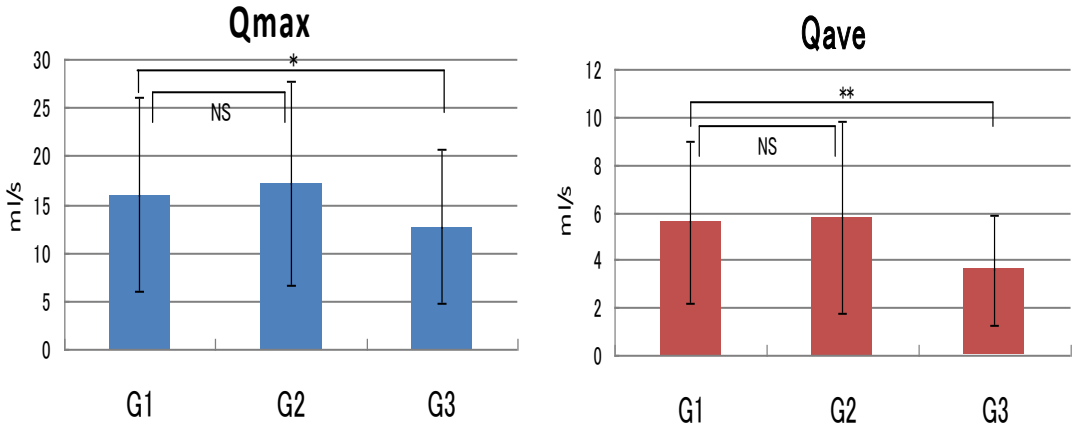
The mean age was 77.0 years (range 28 to 99). The patients’ primary diseases were as follows: 129 had orthopedic diseases, 52 had cerebrovascular diseases, 29 had cardiovascular diseases, 63 had other diseases. Seventy-three patients were in G1, 113 were in G2, and 87 were in G3. No cystoceles were detected in the women. There was no correlation between prostate volume and PVR in men. The uroflowmetric parameters (Mean±Standard deviation [p-value, vs. G1]) in G1, G2, and G3 were as follows (Figure):
Qmax: 16.0±10.0 ml/s, 17.2±10.6 ml/s (p=0.454), and 12.7±7.9 ml/s (p=0.024).
Qave: 5.6±3.4 ml/s, 5.8±4.0 ml/s (p=0.764), and 3.6±2.3 ml/s (p<0.001).
VV: 132.7±83.2 ml, 126.3±77.5 ml (p=0.594), and 82.6±64.0 ml (p<0.011).
PVR: 32.9±74.3ml, 34.1±72.0ml (p=0.909), and 65.4±84.2ml (p=0.010).
No statistical differences were detected between G1 and G2 for any of the parameters.. Meanwhile, in G3, every parameter in UFM was decreased and PVR was increased at a statistically significant level. In the multivariate analysis, independent positive risk factors for PVR of 50 ml or more were an age of 80 years or older (Odds ratio [OR] 2.2), low PM (above G3) (OR 1.3), DM (OR 3.4), and spinal cord injury (OR 4.2).

Interpretation of results

Bladder emptying was impaired in patients with low PM, especially in patients who needed a lot of help for toilet use. Although voiding position-related changes in UFM have been reported as a risk factor for impaired bladder emptying in the elderly, every uroflowmetric parameter in our study was changed by patients’ PM even in the same sitting position. Our results indicate that low PM can be an independent positive risk factor for impaired bladder emptying.

Concluding message

To the best of our knowledge, this is the first study to show that impaired bladder emptying in the elderly depends on low PM, not on prostate volume or the presence of cystocele. Physical rehabilitation could be effective as a nonpharmacological treatment for impaired bladder emptying in the elderly with low PM.



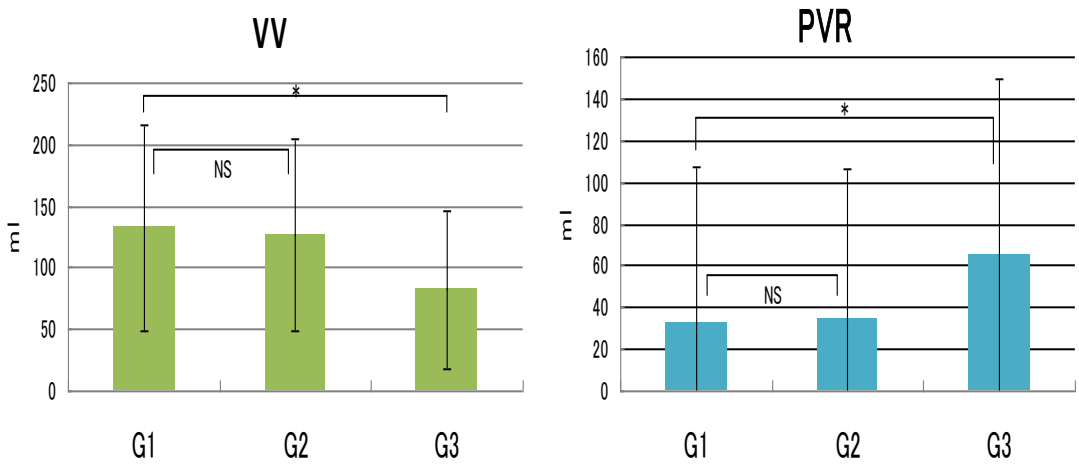


Figure. Uroflowmetric parameters. * p<0.05, ** p<0.001, NS: No statistical difference

Specify source of funding or grant	**none**
Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require ethics committee approval because	**retrospective study**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**