

DEVELOPMENT OF NEW NOMOGRAMS OF URINARY FLOW RATES IN JAPANESE MEN

Hypothesis / aims of study

Uroflowmetry is the measurement of the rate of urine flow over time. The measurement of urine flow is non-invasive and is the easiest urodynamic test useful as preliminary or follow-up investigation of the lower urinary tract symptoms. The clinical usefulness of urinary flow rate has been attenuated by the lack of absolute values defining normal limits. Urinary flow rates depend on voided volume in a nonlinear fashion. Flow-volume nomograms and volume corrected flow rates have been developed to evaluate flow rates over varied voided volumes, ages and both sexes. However, the nomograms were usually constructed using data of urinary flow rates in only one void in each subject (1-3). In this study, urinary flow rates were measured in all voids for 24 hours in each subject. Using the data, we attempted to make new flow-volume nomograms in Japanese men.

Study design, materials and methods

Healthy community-dwelling people in our area were recruited after taking informed consent. Different age groups of the subjects were: 50 to 59 years old (Group 1; n=25), 60-69 years old (Group 2; n=25), 70-79 years old (Group 3; n=25), and 80 years old or more (Group 4; n=25). All subjects were hospitalized for 1 day, and all urinary flow rates of all voids were measured. In addition, IPSS, OABSS, PSQI, OABQ-SF and N-QOL were recorded in all subjects. These four groups were analyzed separately and intergroup differences were also analyzed. In this study, we used Flow-sky (TOTO LTD, Japan) uroflowmeter, which has the same shape as the toilet bowl in the home. All data are stored in the computer inside the machine. We descriptively analyzed flow chart parameters and used statistical calculation for drawing urinary flow rate nomograms.

Results

Using the all plots of all data of subjects, nomograms were constructed following statistical model: $y = \beta_0 + \beta_1x + \beta_2x^2 + b + e$ ($y = Q_{\max}$ or Q_{ave} , x : voided volume, b : effect of subject, e : deviation of measurement). Figure 1 and 2 shows the expected nomograms of $Q_{\max}$ and Q_{ave} by age, respectively.

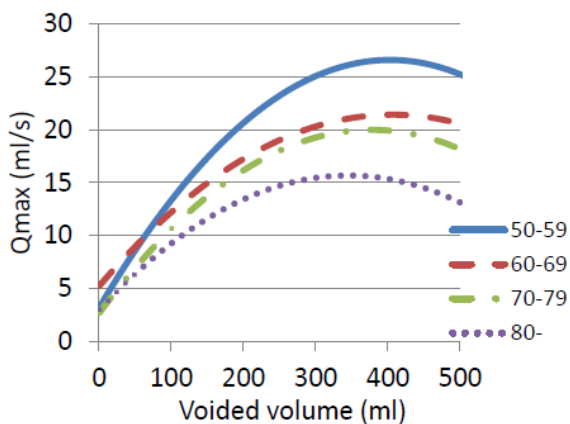


Fig.1 Expected nomogram of $Q_{\max}$

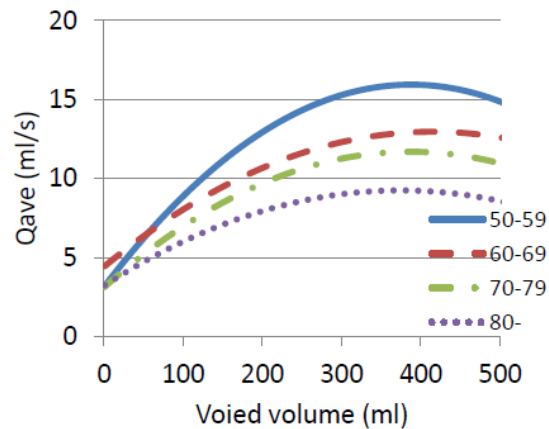


Fig.2 Expected nomogram of Q_{ave}

Interpretation of results

The previously reported nomograms were usually constructed using data of urinary flow rates in only single void in each subject. However, in this study, urinary flow rates were measured in all voids for 24 hours in each subject. The data might be useful for construction of the accurate flow-volume nomograms.

In addition, this new nomogram may be a useful tool for evaluation of the efficacy of various treatments for LUTS

Concluding message

This is the first report for nomograms of urinary flow rates by age in Japanese men. In clinical practice, these nomograms might be useful tool for diagnosis and follow-up of treatment in men with lower urinary tract symptoms.

References

1. J Urol 182: 210-201, 2009
2. J Urol 174: 1436-1409, 2005
3. J Urol 174:1323-1326, 2005

Disclosures

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