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AVERAGE SHAPES OF UROFLOW CURVES OF ADULT MEN

Hypothesis / aims of study
Uroflowmetry is quite a useful and non-invasive examination to assess the status of urination. Nomogram of peak flow rate and average flow rate according to urine volume has been established. However, the normal time-course of flow rate, represented by shapes of uroflow curve, has not yet been discussed, although a “bell shape” is generally believed normal especially in the pediatric area. We investigated to elucidate the normal shapes of uroflow curves of adult men.

Study design, materials and methods
Eight volunteers, aged 27 to 40, were recruited in this study after informed consent. The score of the International Prostate Symptom Index was 0 in all subjects. Uroflow examination was sequentially performed over two to seven days, like a frequency-volume chart, using a portable uroflowmeter (Urimetry®, Kansaiseiki Co.Ltd., Higashiosaka, Japan). Data from 115 voids were obtained. Of these, the data from 20 voids with 200-299 ml of voided volume, and those of 12 voids with 300-399 ml of voided volume were analyzed. Each uroflow curve was divided into 200 points, each of which was represented on an X-Y table using two numbers. The peak point in the Y-axis was determined to be 0.8 and the total voiding time was determined to be 1. Average curves were delineated based on the mean values and standard deviations.

Results
The results were depicted in Figures 1 and 2. In both groups, slopes before peak flow rate were steeper than those after peak flow rate, which did not make the curves “bell-shaped.” In the curves for 200-299 ml voidings, the peak flow occurred the first quarter of the total voiding time (0.235-0.265), and terminal dribbling existed after 0.825. In the curves of 300-399 ml voidings, the peak of the flow occurred between 0.215-0.285 of voiding time, and the plateau near the peak flow occurred between 0.13-0.415 of voiding time.

Interpretation of results
For normal adult men, the average shape of the uroflow curves is not “bell-shaped.” The shapes of uroflow curves slightly differ according to voided volume.

Concluding message
Average shapes of normal uroflow curves are valuable, since abnormal curves should be recognized based on the degree of deviations from normal curves.

Figure 1: Average uroflow curves of 200-299ml voidings

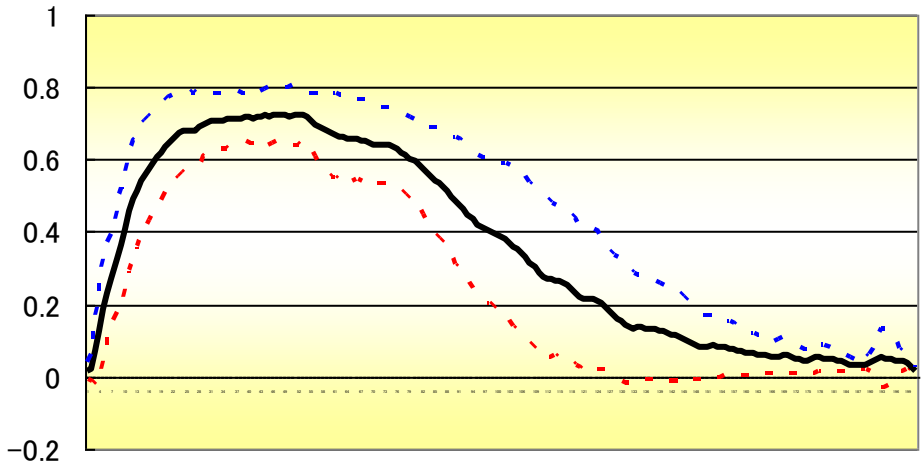
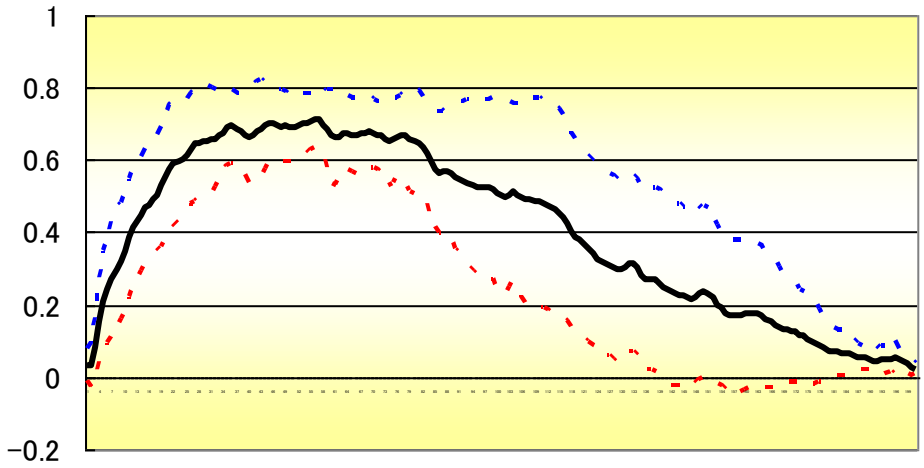


Figure 2: Average uroflow curves of 300-399ml voidings



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Is this study registered in a public clinical trials registry?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Kyoto university ethics committee**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**