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THE EFFECT OF DIURESIS DURING 20-MINUTE PAD TEST WITH STRONG-DESIRE AMOUNT IN THE BLADDER FOR EVALUATING THE SEVERITY OF FEMALE STRESS URINARY INCONTINENCE

Hypothesis / aims of study

The effect of diuresis may result in overdistension of urinary bladder during pad testing. Thus, the aim of this study is to estimate the amount of diuresis during 20-minute pad test with strong-desire amount in the bladder, and refine the amount of water infusion used for this 20-minute pad test.

Study design, materials and methods

We reviewed the clinical data, urodynamic data, pad weight results and bladder diaries of female patients who underwent urodynamic studies and 20-minute pad tests with strong-desire amount in the bladder [1] at the urogynecologic clinics of a medical center between January 2008 and March 2015. After completion of urodynamic study, we infused the strong-desire amount of distilled water into the bladder immediately before 20-minute pad test; thus the diuresis amount during this 20-minute pad test was equal to the sum of pad weight, voided volume, post-void residual volume after pad test, and minus the strong-desire amount.

Results

The mean diuresis amount was 172.3±88.5 mL (n=2,858, Table 1). The diuresis amount was significantly correlated to age, the voided volume at uroflowmetry, the strong-desire amount, the urgency amount and the average voided volume in bladder dairy (Table 2). The predicted diuresis amount (y) for a given age (x1) and the urgency amount (x2) could be equated by y=-1.4x1+0.3x2+159.1. However, the equation was not good enough to predict the diuresis amount due to low R-squared (Table 3). The difference between the diuresis plus strong-desire amount (417.0±121.2 mL) and the urgency amount (322.3±86.7 mL) was 94.8±86.8 mL, and the ratio of the above value to the strong-desire amount (244.7±62.4 mL) was 0.39. If we use the infused fluid with 0.61 of the strong-desire amount as the infused volume at pad testing, then we can find the diuresis amount minus 0.39 of the strong-desire amount is similar to the difference of strong-desire and urgency amount (76.8±85.3 vs. 77.5±40.5 mL, P=0.10 by Wilcoxon signed-rank test, Figure 1).

Interpretation of results

We find a significant amount of diuresis, which may result in bladder overdistension during this 20-minute pad test; and this may overrate the severity of stress urinary incontinence. If we use 0.61 of the strong-desire amount as the infused volume before performing 20-minute pad test, we can find that 0.61 of the strong-desire amount plus the diuresis amount is similar to the urgency amount.

Concluding message

A significant amount of diuresis can be found during 20-minute pad testing. A 0.61 of the strong-desire amount may be the most appropriate infused volume while performing the 20-minute pad test.

Table 1. Baseline data of women who underwent 20-minute pad testing with strong-desire amount in the bladder (n=2,858)

Variables	Values
Age (years)	58.5±12.8
Voided volume at uroflowmetry (mL)	218±121
Post-void residual volume at uroflowmetry (mL)	45±39
Strong-desire amount (mL)	244.7±62.4
Urgency amount (mL)	322.3±86.7
The difference between strong-desire and urgency amount	77.5±40.5
Pad weight (g)	19.8±35.2
Voided volume just after pad testing (mL)	362.3±140.4
Post-void residual volume just after pad testing (mL)	35.0±49.5
Diuresis volume (mL/20 min)	172.3±88.5
Average fluid intake in bladder dairy (mL/h)	135±76
Average voided volume in bladder diary (mL/h)	102±64

Table 2. Correlations between the diuresis amount and other variables

Variables	Spearman's rho	†P value
Age (years)	-0.27	<0.001
Voided volume at uroflowmetry (mL)	0.31	<0.001
Post-void residual volume at uroflowmetry (mL)	-0.02	0.24
Strong-desire amount (mL)	0.26	<0.001
Urgency amount (mL)	0.32	<0.001
Average fluid intake in bladder dairy (mL/h)	0.10	<0.001
Average voided volume in bladder diary (mL/h)	0.22	<0.001

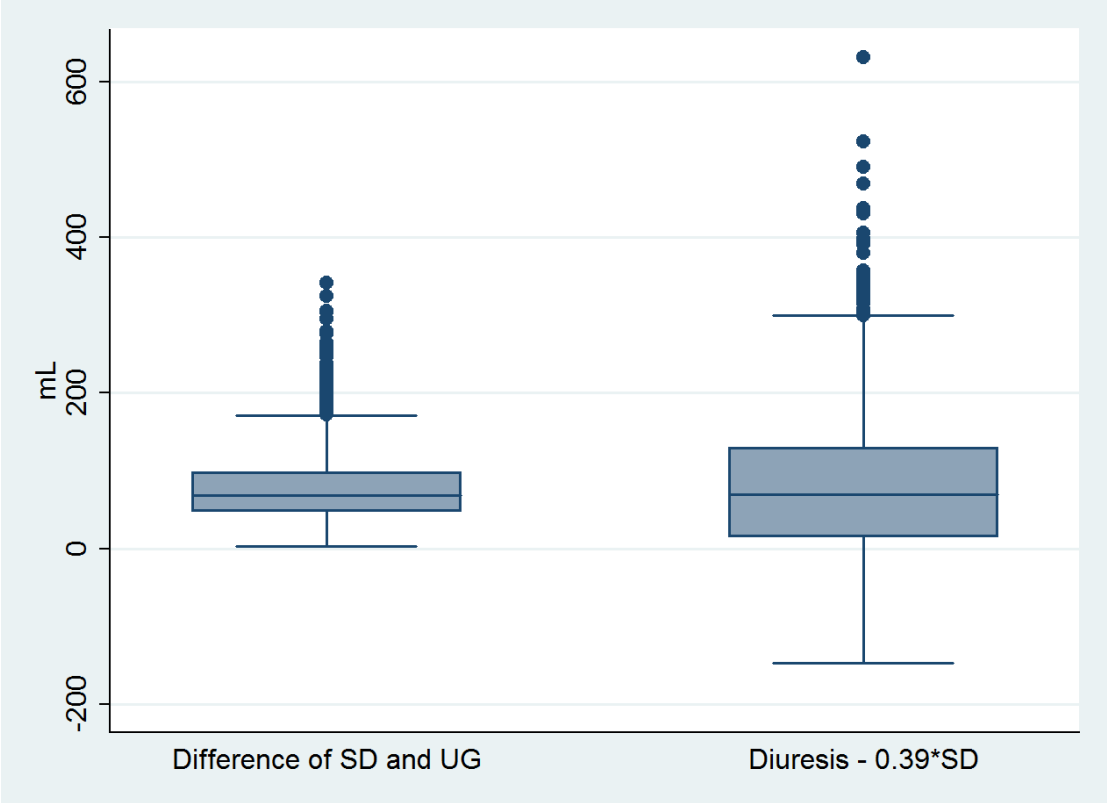
†Spearman correlation test.

Table 3. Multivariate linear regression analysis to predict the diuresis amount

Variables	Coefficient	95% confidence interval	P value
Age (years)	-1.4	-1.6 to -1.2	<0.001
Urgency (mL)	0.30	0.26 to 0.33	<0.001
Constant	159.1	139.8 to 178.4	<0.001

R^2 = 0.14.

Figure 1. Box plot of the difference of strong-desire (SD) and urgency (UG) amount and the diuresis amount minus 0.39 of the strong-desire amount



References

1. Wu WY, Sheu BC, Lin HH. Twenty-minute pad test: comparison of infusion of 250 ml of water with strong-desire amount in the bladder in women with stress urinary incontinence. Eur J Obstet Gynecol Reprod Biol 2008;136:121-5.

Disclosures

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