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COMPARISON OF VOIDING DYNAMICS IN GENUINE STRESS INCONTINENT WOMEN AND NORMAL HEALTHY VOLUNTEERS.

Aims of Study

During the last decades genuine stress incontinence (GSI) has been addressed as a lower urinary tract (LUT) dysfunction caused by urethral resistance deficiency during the storage phase. Less attention has been given to the micturition phase in patients with GSI. In order to find out whether women with GSI can be used as normal control groups in studies that focus on diagnosing or treating voiding dysfunction, we evaluated urodynamic voiding parameters in women with GSI and compared these with data from asymptomatic young female volunteers.

Methods

All women presenting for urodynamic tests and complaining of GSI were considered for inclusion in this prospective unicenter study. Study exclusion criteria were: women with presence of urge or mixed incontinence, women with retention symptoms, with overt neurologic disease or on catheterisation. Furthermore intake of drugs with a known effect on LUT function was also considered an exclusion criterium. 98 women entered the study. Urine loss during coughing was objectively demonstrated during clinical examination. Mean age was 57 ± 14 years (range 32 – 83) and mean parity 2.7 ± 1.7 (range 1 - 9). We also prospectively investigated 42 healthy female volunteers. Mean age of the volunteers was 21.7 ± 2.1 years (range 18 – 26). All volunteers were nulliparous women, symptom- and history-free. All participants underwent a uroflowmetry and a pressure flowmetry at strong desire to void. The data were statistically analysed using non parametric tests (Mann-Whitney U test and Chi square test).

Results

Comparisons of the quantitative and qualitative data from both uroflowmetry and pressure-flowmetry are summarized in table 1 and 2.

Table 1: quantitative analysis of free flowmetry and pressure-flowmetry.

	Mean ± SD	Min - max	Mean ± SD	Min – max	P value
Pressure flow	*Volunteers*		*GSI women*		
Vol voided (ml)	430.1 ± 160.5	76 – 822	446.0 ± 195.2	14 – 1108	
Voiding time (s)	66.8 ± 48.2	13 – 200	77.0 ± 62.5	6 – 429	
Flow time (s)	46.3 ± 28.6	9 – 132	51.6 ± 26.7	6 – 156	
Max flow (ml/s)	23.8 ± 9.9	7 – 46.7	22.3 ± 11.1	3.2 – 64.3	
Av flow (ml/s)	11.1 ± 5.7	3 – 27.4	10.1 ± 5.6	1.7 – 25.4	
Time to max (s)	21.6 ± 16.9	3 – 78	29.4 ± 33.3	1 – 316	
PdetQmax (cm H2O)	**35.0 ± 12.4**	17 - 76	**20.9 ± 16.4**	1 - 123	**0.009**
Free flow					
Vol voided (ml)	235.1 ± 90.1	102 – 389	261.6 ± 132.8	111 – 737	
Residual urine (ml)	**0**	0	**63.4 ± 109.0**	0 – 394	**0.028**
Voiding time (s)	**19.1 ± 11.8**	9 – 53	**35.3 ± 28.9**	9 – 127	**0.015**
Flow time (s)	**17.5 ± 10.0**	9 – 46	**25.6 ± 15.0**	9 – 74	**0.030**
Max flow (ml/s)	**29.2 ± 9.4**	17.5 – 46.7	**21.8 ± 9.4**	7.8 – 48.4	**0.009**
Av flow (ml/s)	**18.5 ± 11.2**	8.4 – 55.6	**11.0 ± 5.3**	2.1 – 25.0	**0.004**
Time to max (s)	7.9 ± 5.6	3 – 26	14.3 ± 18.4	3 – 82	

Table 2: qualitative analysis of free flowmetry and pressure-flowmetry.

Sphincter activity	*Volunteers*	*GSI women*	*P value*
Normal: Relaxing	**65.7 %**	**40.6 %**	**0.015**
Abnormal	**34.3 %**	**59.4 %**	
Intermediate relaxing	11.4 %	18.8 %	
Non relaxing	22.9 %	40.6 %	
Straining			
No	**69.5 %**	**42.4 %**	**0.006**
Yes	**30.5 %**	**57.6 %**	
Start voiding	11.1 %	9.4 %	
Entire voiding	19.4 %	48.2 %	
Max detrusor pressure			
> 30 cm H2O	**86.1 %**	**56.0 %**	**0.002**
<30 and >0 cm H2O	**13.9 %**	**20.2 %**	
= 0 cm H2O	**0%**	**23.8 %**	
Flow pattern			
Pressure flow			
Normal	27.8 %	24.7 %	
Undulating	47.2 %	50.7 %	
Voided 2x	16.7 %	2.7 %	
Long flow + low max flow	8.3 %	21.9 %	
Free flow			
Normal	47.4 %	50.0 %	
Undulating	31.6 %	25.0 %	
Voided 2x	10.5 %	2.5 %	

Conclusions

Quantitative analysis of pressure-flowmetry does not show different value of voiding parameters in GSI women, except for a lower detrusor pressure at maximal flow. However GSI women do void differently as compared to young healthy female volunteers as demonstrated both by further analysis of free uroflowmetry and of pressure-flowmetry.

Our results clearly show that GSI is a condition in which urodynamic changes are significant not only during bladder filling but also during bladder emptying. Therefore the micturition pattern of GSI women cannot be used as a “normal control group” in trials on voiding dysfunction.

Furthermore our data suggest that both quantitative and qualitative analysis of flow studies are important. The exact cause of the altered voiding cannot be determined from our data as yet. Parity, age and other factors may play a role which we will try to further evaluate in the near future.