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COMPUTER-SCANNED URINARY DIARY VARIABLE VALUES FROM URGE INCONTINENT PATIENTS AND ASYMPTOMATIC CONTROLS

Hypothesis / aims of study

Urinary diaries are valuable in the evaluation of incontinent patients. Manual calculation of urinary diary variables is tedious and precludes routine clinical use of some urinary diary variable values calculable from diaries of several days' length. With the advent of computer-scanned urinary diaries, it is reasonable to consider the values of several diary variables during clinical care.

Now that clinicians can expect to easily know values of key urinary diary variables, it becomes ever more important to understand normal and abnormal values for those variables. There is a paucity of data concerning the urinary habits of asymptomatic adults, and even less information concerning the manner in which diary values from symptomatic patients differ from norms. Our objective was to describe how values of urinary diary variables calculated from scanned urinary diaries of urge incontinent (UI) patients differed from those of asymptomatic controls.

Study design, materials and methods

After Institutional Review Board or Ethics Committee approval, UI patients reporting at least one UI episode weekly were recruited to this study at two clinical centers. At one center they completed a 3-day urinary diary, and at the other, completed a 7-day urinary diary of which records from the first 3 days were used in this analysis. Asymptomatic subjects were recruited at three sites and similarly completed a 3-day urinary diary. The asymptomatic subjects denied any urinary tract symptoms or previous urologic surgery during their completion of a screening questionnaire. A computerized diary reader (Life-Tech, Inc., Texas, U.S.A.) read the 3-day diaries and calculated diary variables.

Because prior studies have shown that urinary variable values from asymptomatic adults vary with age and race, each UI patient was matched by age (within 5 years) and race with an asymptomatic adult. We compared median urinary diary variable values of patients to those of controls using Mann Whitney tests, considered significant at the 5% level.

Results

We were able to match 63 UI women with 63 asymptomatic controls. Scanning of 3-day urinary diaries took approximately 2 minutes for each subject. Patients were mean 57 (range 33-86) years old, and 59 (94%) of the pairs were Caucasian, with the remaining 4 (6%) pairs of patients being African American. Four (6%) of the asymptomatic controls recorded urine leakage episodes during their 3-day diaries. Fifteen (24%) of UI patients recorded no incontinence episodes during their 3-day diary. The median number of incontinence episodes daily was 1.0 among UI patients (range 0-10 episodes daily).

Table I details diary variable values. Urinary output and diuresis rates were similar when the groups were compared, suggesting that UI patients had not altered their fluid intake significantly as a means of compensating for their symptoms. UI patients voided a median of two times more often than their asymptomatic counterparts during a 24 hour period. Nocturic frequency was statistically significantly increased in UI patients, but the difference from controls was not large (median 0.4 voids nightly). Minimum, maximum, range and average voided volumes were all decreased in the UI group, with clinically meaningful differences appreciated.

Interpretation of results

Urinary diary variable values calculated from computer scanning of 3-day diaries suggest urinary frequency values and measures of volumes voided differ when UI patients are compared to controls. The absolute differences in measures of urinary frequency were small in this group, suggesting that their symptoms were not severe. As expected from the study design, the single feature that most distinguished UI patients from controls was the frequency of

incontinent episodes. Measurement of urinary urgency at the time of voids or leakage would likely further distinguish UI patients.

Table I: Mean diary variable values calculated from 3-day diaries of age- and race- matched samples of women with and without UI symptoms. Figures represent median (interquartile range) and significance of the result of Mann Whitney test.

Diary Variable	Urge incontinent patients N=63	Asymptomatic subjects N=63	P value
Frequency of micturition / 24h	9.2 (7-11.4)	7.3 (5.6-8.4)	**<0.001**
Number of daytime voids	8.1 (6.1-10.0)	6.6 (5.4-8.0)	**0.01**
Number of nighttime voids	0.7 (0-1.7)	0.3 (0-0.7)	**0.01**
24 hour voided volume (mL)	1459 (1049-2075)	1600 (1346-2050)	0.17
Daytime volume (mL)	1096 (652-1526)	1118 (910-1567)	0.6
Nighttime volume (mL)	386 (309-577)	440 (305-638)	0.16
24 hour diuresis rate (mL/min)	1.0 (0.7-1.4)	1.1 (0.9-1.4)	0.09
Daytime diuresis rate (mL/min)	1.0 (0.7-1.5)	1.1 (1.0-1.7)	0.09
Nighttime diuresis rate (mL/min)	0.8 (0.6-1.1)	0.9 (0.6-1.3)	0.17
Minimum voided volume (mL)	50 (25-60)	50 (50-100)	**0.02**
Maximum voided volume (mL)	350 (275-525)	480 (400-600)	**0.01**
Average voided volume (mL)	153 (123-210)	235 (168-304)	**<0.001**
Range of voided volume (mL)	325 (225-450)	400 (320-525)	**0.003**

Concluding message

Computer scanned diaries allow rapid calculation of urinary diary variable values that are clinically relevant and distinguish urge incontinent patients from asymptomatic controls.

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