

FREQUENCY-VOLUME CHART: A COMPARISON BETWEEN 3 AND 7 DAYS RECORDS IN PATIENTS WITH NEUROGENIC URINARY DYSFUNCTION

Hypothesis / aims of study

Micturition diaries are widely used by clinicians interested in voiding dysfunction. On the other hand the majority of patients suffering from neurological deceases are also facing neurogenic urinary dysfunction. Especially in this group of patients the assessment of the lower urinary tract symptoms (LUTS), based upon the usual history-taking is inaccurate, due to neurological alternation of the urinary function and subjective factors involving both patients and physicians. Thus, the use of frequency-volume (FV) charts, for evaluating micturition can be more objective and accurate. FV chart is an inexpensive, noninvasive tool that allows the assessment of LUTS providing information's outside the setting of a clinical interview [1]. Patients need to record:

- The time of each voiding episode and the urine volume
- The time of episodes of urgency (with or without urge incontinence)
- The time and the amount of intake fluids.

We have to mention that in some patients voiding is taking place by the use of intermittent catheterizations so these patients have to record the time of catheterization, the volume of urine and the incontinence episodes.

The aim of our study was to determine the optimal length of FV chart for assessing the voiding behaviour comparing 3-day diaries versus 7-day diaries with respect to patient compliance.

Study design, materials and methods

Our study included, 113 consecutive patients who were admitted in our departments suffering from neurogenic urinary dysfunction from January 2008 to December 2009. The patients ranged in age from 23 to 69, with a mean age of 47.3 years. Additional inclusion criteria were men and women 20 years and older with, mentally fit with the ability to understand and communicate. Exclusion criteria were age more than 70 years, confused state or depression, bladder cancer, pregnancy, bladder stones, diabetes, and urinary tract infection or social reasons making the recording of the diary not achievable.

All patients underwent physical examination, history, urine analysis, ultrasound and post-void residual urine volume evaluation. Patients received a diary form and were asked to complete the FV chart for 7 consecutive days beginning with the first morning void, including the precise time and volume of each void. The beginning of every day was at 08.00 a.m. and the end at 07.59 a.m. next morning. Based on the FV charts, the following parameters were assessed: voiding frequency during daytime, voiding frequency during night-time, mean volume per void (ml per micturition), and the total volume of voiding urine per day and the total fluid intake per day.

In the present study, we assumed the 7-day chart as the gold standard, since is one of the most using tools in previous reports. So, we compare all the records of the first 3 days of each diary with the respective records of the entire 7 days diary. Statistic analysis took place with the use of statistical programs SPSS17.0 and Graph Pad 4.0 for the diagrams, selecting walcoxon statistical method as the most proper one for this non parametric study.

Results

The total amount of intake fluids and the times of drinking were not statistical different from 3 to 7 days recording. The same observation took place regarding the voiding times and volumes and the incontinence episodes as well. In all comparing parameters the p-value was > 0.05.

Interpretation of results

There were no statistically significant differences between 3-day and 7-day FV charts at any separate record. Results of the inter-chart reliability analyses added concurrent validity to the hypothesis that the 3-day chart is equivalent to a full 7-day period. The use of diaries makes possible to document voiding patterns in the patient's environment and during various daily activities. Therefore, they are particularly important for providing objective evidence of changes in subjectively measured symptoms after therapy. No evidence-based data indicating the minimum number of days necessary to maintain a chart to furnish reliable data could be found in the literature. Micturition diaries vary in duration from 24 hours to 14 days [2, 3]. Some investigators recommend a 7-day chart, while others recommend a 5-day one. Although a 7-day chart usually includes a complete variety of social activities, most patients find it too protracted. Different results may arise from different measuring tools. Although test-retest reliability is clearly enhanced by prolonging the test period, complex and prolonged studies are also associated with patients bothersome. Although increasing the duration of the test to 7 days will increase its reliability, patient compliance, however, will decrease. On the other hand storage and voiding function are not so influenced from social or environmental factors in neurogenic patients, as the neurologic condition is manly responsible for the urinary dysfunction.

Concluding message

In conclusion, our study indicates that, in patients with neurogenic urinary dysfunction, the 3-day chart is as adequate as the 7-day chart. This reduction in the length of time does not seem to compromise reliability of results and should improve patient compliance.

References

1. Bryan NP, Chapple CR. Frequency volume charts in the assessment and evaluation of treatment: how should we use them? *Eur Urol.* 2004 Nov;46(5):636-40.
2. Yap TL, Cromwell DC, Emberton M.A systematic review of the reliability of frequency-volume charts in urological research and its implications for the optimum chart duration. *BJU Int.* 2007 Jan; 99(1):9-16.
3. Schick E, Jolivet-Tremblay M, Dupont C, Bertrand PE, Tessier J. Frequency-volume chart: the minimum number of days required to obtain reliable results. *Neurourol Urodyn.* 2003; 22(2):92-6

<i>Specify source of funding or grant</i>	NONE
<i>Is this a clinical trial?</i>	Yes
<i>Is this study registered in a public clinical trials registry?</i>	No
<i>Is this a Randomised Controlled Trial (RCT)?</i>	No
<i>What were the subjects in the study?</i>	NONE