

A NEW 3 DAY BLADDER DIARY AS AN APP FOR SMART-PHONE: FEASIBILITY AND SATISFACTION ASSESSMENT

Hypothesis / aims of study

The use of electronic bladder diaries (BD) may have advantages such as a more intuitive data entry or reducing calculation time. As the use of smart-phones is spread world-wide, our aim was to develop a very easy to use electronic bladder diary (eBD) as a mobile app and test its feasibility and acceptance in a reduced number of patients.

Study design, materials and methods

We developed a 3 day electronic bladder diary app for smart-phone (eDM3d) based on the Spanish validated bladder diary (1), which includes a frequency-volume chart, urgency episodes, urgency intensity (PPIUS scale), urgency and stress incontinence episodes, need of changing pads and fluid intake. The interface obtained consisted in only 4 buttons (micturition, intake, wake-up, sleep) that had to be clicked to create an event. Identical iPhone and Android versions were built.

From the eDM3d the following variables were automatically obtained: mean 24h frequency (24F), mean daytime frequency (DF), mean nighttime frequency (NF), maximum daytime bladder volume (MdBV), maximum nighttime bladder volume (MnBV), mean bladder volume (mBV), mean urgency episodes/day (Urg), maximum grade of urgency (MUrg), mean urgency incontinence episodes/day (UI), mean stress incontinence episodes/day (SI), mean pad change episodes/day (Ch), mean 24h fluid intake (FI), mean 24h volume urine (24VU), mean nighttime volume urine (NVU). Results were instantly transferred to an internet server where an electronic report could be obtained.

We recruited 45 consecutive patients who attended the Urology clinics due to overactive bladder syndrome (OABs) (defined as urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of urinary tract infection or other obvious pathology) or nocturia (understood as the complaint of interruption of sleep one or more times because of the need to micturate when each void is preceded and followed by sleep), who had a smart-phone and with previous experience with paper BD. They were asked to complete the eDM3d and then to answer a direct question about satisfaction: "If you had to complete a BD again, would you choose the paper or the app version?".

Results

There were 27 men (60%) and 18 women (40%), mean age 61.8 years (range 19-81). Thirty nine patients (86.6%) presented with an OABs and 41 (91.1%) with nocturia. Twenty eight (62.2%) patients were on medical treatment (anticholinergics or β 3 agonists) and 10 patients (22.2%) had received Botox®. Fourteen patients (31.1%) had an iPhone while 31 (68.8%) had an Android smart-phone. Mean time owning a smart-phone was 4.3 years (1-10) and mean reported hours/day using it was 3.7 (0.5-7). Two patients (4.4%) did not complete the eDM3d, 3 patients (6.6%) completed only 1 day variables, 7 patients (15.5%) completed 2 days variables and 33 patients (73.3%) completed 3 day variables.

The table shows mean results of variables from eDM3d:

Variable	Mean (range)
24F	9.7 (4.3-20)
DF	8.3 (3.3-16.3)
NF	1.3 (0-5.6)
MdBV ml	390.2 (150-1100)
MnBV ml	246.6 (140-650)
mBV ml	105.5 (56.1-164.5)
Urg	1.3 (0-7)
MUrg	2.4 (0-4)
UI	0.4 (0-3)
SI	0.4 (0-7.3)
Ch	0.5 (0-7.3)
FI ml	1389.3 (200-3083.3)
24VU ml	1711.6 (850-3060)
NVU ml	306.8 (0-936.8)

Regarding satisfaction, among those 43 patients who completed at least 1 day of the eDM3d, 37 (86%) patients would choose the app version if they had to repeat a BD again while 2 patients (4.6%) would choose a paper version. The other 4 patients (9.3%) would choose either indistinctly.

Interpretation of results

To our knowledge, this is the first study assessing the feasibility of an electronic bladder diary designed as an app for smart-phone. According to our results, this eBD has a high fulfillment rate, as 73.3% of patients completed all 3 day data and only 4.4% of them did not complete any variable. The fact that a 100% fulfillment is not reached is probably a consequence of the difficulties in urine volume measurement and the bladder diary itself and not related to the electronic/paper version format.

Variables obtained with the new eBD are the same as those obtained with the paper validated Spanish version of 3 day BD. To physicians, the main advantage of the eDM3d is that there is no need to calculate this variables manually, as they are automatically obtained from the server. Despite this, adequate validation and comparison with the conventional paper BD is required, although it seems that this eBD is a feasible tool whose use could be extended in the daily clinical practice. Regarding patients benefits, we must highlight the high satisfaction rate, as 86% of patients would repeat the app version if they had to complete a BD again.

Concluding message

The electronic bladder diary as an app for smart-phone eDM3d is a useful tool easily filled in by patients with a high satisfaction rate. Adequate validation and comparison with the conventional paper BD is required.

References

1. Jimenez-Cidre MA, et al. The 3-day bladder diary is a feasible, reliable and valid tool to evaluate the lower urinary tract symptoms in women. *Neurourol Urodyn*.2015;34(2):128-32.

Disclosures

Funding: NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Comité Ético de Investigación Clínica del Hospital Clínic de Barcelona **Helsinki:** Yes **Informed Consent:** Yes