

DEVELOPMENT AND ASSESSMENT OF TWO ELECTRONIC BLADDER DIARIES; A PILOT STUDY

Hypothesis / aims of study

To develop an electronic bladder diary to facilitate use by patients with LUTS and assist interpretation by health professionals (HP) in both a community and hospital setting. To assess patients' ease of use and preferences in a pilot crossover study of two formats of electronic diary against a standard paper diary. To assess HP opinions on the electronic bladder diary reporting system.

Study design, materials and methods

An academic collaboration consisting of clinicians, medical engineers and computer scientists developed two bladder diaries; 1) electronically read paper diary (Fig 1)- this involved scoring points on a card with pencil which was then read by a card reader, and 2) e-diary (Fig 2)- a handheld touchscreen device (similar to a mobile phone) which is uploaded into customised software on a PC. Both diaries generated reports in the same format.

In this pilot study of 22 patients with LUTS, 11 patients completed each electronic diary for three consecutive days. This was either preceded by or followed by a paper diary for three consecutive days. On the seventh day patients completed both diaries to check for concordance. Patients reported their perceptions on both the paper and electronic diaries using a standardised questionnaire at the end of the study period.

Twenty-two HP were given the paper diary as filled out by the patient and the e-diary output, alternating the report which was given first. Time taken for reading and analysis was recorded along with accuracy and reported preferences.

Results

Patients were aged between 26-82 years and 64% were female. Two out of 11 patients found both the paper and electronically read diaries difficult to complete compared to only one who found the electronic diary difficult. Of the patients, five preferred the paper diary over the electronically read diary and only one preferred the paper diary over the e-diary (Fig 3). There were no significant differences in the reported frequency and volumes between the paper and electronic diaries. Patients recorded more episodes of incontinence and urgency on the electronic diaries as these are specifically asked for.

HP calculated the parameters with 58% accuracy from the paper diary compared to 100% for the electronic report (Table 1). Preferences were 50% for the electronic report, 41% for the paper and 9% had no preference. The mean time (\pm STDEV) taken to complete reading each report was 82.5(\pm 39.15) seconds and 49.5(\pm 18.38) seconds for the paper and electronic reports respectively.

Interpretation of results

The highest patient preference was for the e-diary (82%). Reasons cited were that it was quicker, more discrete and easier to complete. The electronic diaries have good concordance with the paper diaries but patients are more likely to report incontinence and urgency. Electronic reports make analysis more accurate and save time for HP.

Concluding message

Electronic diaries have in the past been found to be difficult and time consuming for patients to use, but we have shown this electronic format has overcome this problem. An e-diary helps increase patient compliance and improve precision of recordings. Electronic reports make analysis and interpretation by HP quicker and more accurate. This development has been long overdue, since bladder diaries are recommended practice in all treatment algorithms for LUTS in both male and female patients. This system will be available at low cost in the United Kingdom. A larger scale community based study is underway to confirm these findings.

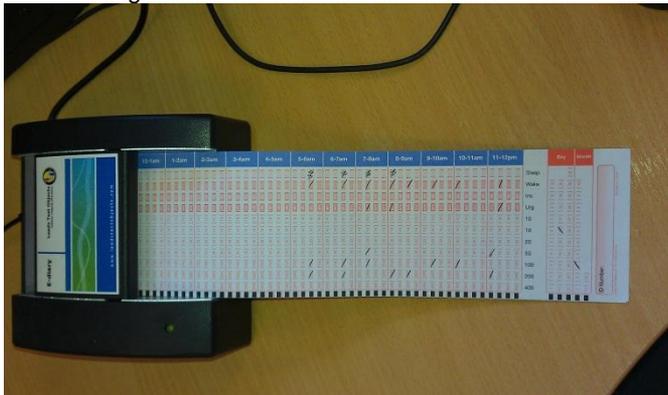


Fig 1. Paper diary being read by card reader.



Fig 2. Image of e-diary.

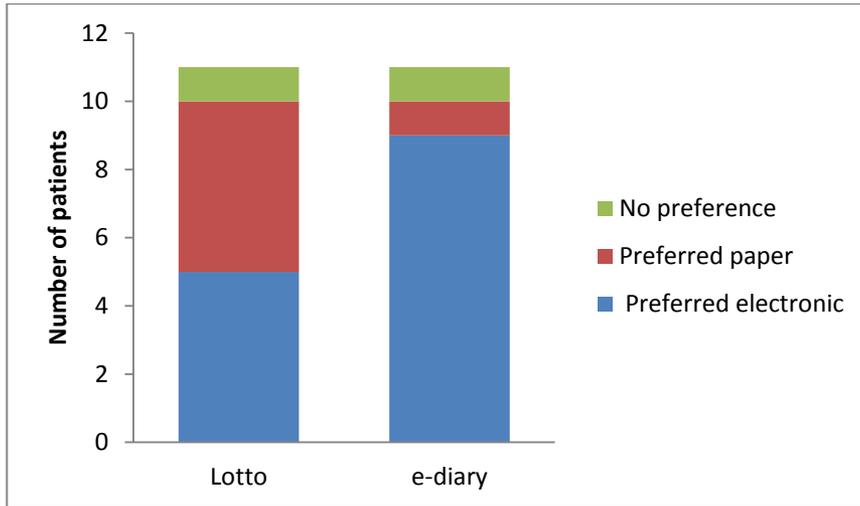


Fig 3. Patient reported preferences for electronic diaries vs. paper diary.

Parameters	Accuracy of HP reading from paper diary	Accuracy of HP reading from electronic diary
Frequency day	88%	100%
Frequency night	80%	100%
Volume voided/day	20%	100%
Nocturnal volume	0%	100%
Functional bladder capacity	100%	NR
Urgency episodes per day	NR	100%
Incontinence episodes per day	60%	100%
Mean accuracy for 6 reported parameters	58%	100%

Table 1. Accuracy of reading bladder diary reports by 22 health professionals (HP), NR=Not reported.

Disclosures

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