METHODS

We retrospectively analysed a database of women with urinary tract dysfunction and an urodynamic diagnosis of obstructed voiding. Obstruction was defined when the peak-flow rate was < 15ml/sec and the maximal detrusor voiding pressure > 60cmH_2O. From this group of patients we tried to identify any other urodynamic finding, using different cut-off values, which could be indicative of their condition such as post-void residual, the ratio between the post-void residual and the voided volume and the maximal urethral closure pressure (MUCP). The MUCP was adjusted to age according to Rud formula: [(110 - age) x 110/100].

The data were analysed in terms of cumulative percentage at different cut-off values.

RESULTS

The urodynamic parameters of five-thousand-two-hundred-and-eight women with a mean age 52.2 years (range 27.0 - 79.0yrs) complaining of urinary tract dysfunction were analysed for this study. Eighty-one women (1.5%) with a mean age of 48.6 years (range 29.1-71.9 years) had a final diagnosis of obstructed void. When the post-void residual was analysed we could not get data from 3 women (3.7%). Table 1 shows the cumulative percentage of this group of obstructed women when different cut-off values for post-void residual were used.

Table 1. Cumulative percentage when different cut-off values of post-void residual were used.

Residual	**20ml**	**50ml**	**100ml**	**150ml**	**200ml**
Cumulative %	60.5	72.8	85.2	90.1	92.6

Using different cut-off values for the ratio between the post-void residual and the voided volume expressed in percentage, we had the findings shown in table 2.

Table 2. Post-void residual/voided volume % with different cut-off values

Residual/voided volume %	**0.0**	**25%**	**33%**	**50%**
Cumulative %	41.1	64.4	65.8	79.5

The MUCP adjusted to age according to the Rud formula was normal in 61.8% of the women considered.

CONCLUSION

In this group of obstructed women 41.1% could not void during urodynamics. A post void residual > 150ml and a ratio between the post-void residual and the voided volume expressed in percentage of 50% could be considered indicative of the final urodynamic diagnosis and therefore used as ancillary parameters in less evident situations of voiding difficulties. On the contrary the MUCP adjusted to age does not seem to be of any value in discriminating voiding difficulties in women.

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

THE REPEATABILITY AND DEFINITION OF MILD, MODERATE AND SEVERE ON THE 24 HOUR PAD TEST IN 96 INCONTINENT WOMEN

Aims of the study

The one hour pad test is recommended by the International Continence Society as an objective measure of urinary incontinence[1].However, it has a 14% false negative rate when compared to cystometry[2] and it's test retest reliability has been shown to be inadequate[3,4].Moreover it requires a degree of physical mobility and may not replicate the incontinence experienced with everyday activity. For these reasons, there is now considerable interest in using the 24 and 48 hour pad tests. The upper limit of 24 hour pad weight gain for continent controls has been established as being 8g[5]. But, the categories of mild, moderate and severe have not been defined

The purpose of this study was to evaluate:

1) the daily variation in urinary loss over 7 days
2) weather a single 24 hour pad test is able to predict the severity of urinary incontinence
3) what constitutes mild, moderate and severe on 24 hour pad testing.

Methods

Those women complaining of urinary incontinence who were able to perform the provocation exercises for the standardised 1 hour pad test and who were willing to undertake seven 24 hour pad tests were recruited. All tests were undertaken prior to treatment. The women initially underwent two 1 hour pad tests 1 week apart and were then issued with sufficient preweighed pads to be worn over 24 hours for 7 consecutive days. The pads were returned in sealable plastic bags, marked to identify the individual days. Fluid intake diaries, days of worst leakage , physical activity and factors provoking leakage were recorded by the women undergoing the tests. Non-parametric statistics were used to analyse this data as it was not normally distributed.

Results

Ninety six women (median age 59, IQR 44-75) underwent two 1 hour pad tests and seven consecutive 24 hour pad tests. Of these 15(16%), were excluded as 12 (13%) were completely dry on both 1 hour pad testing and on seven 24 hour pad tests, and 3(3%) were excluded as they commenced treatment.

Of the 96 women 4 did not complete all seven 24 hour pad tests, but completed 5 days. There were large inter- and intra-patient variations in 24 hour pad test losses over the 7 days, depending on physical activity and provocation factors (fig 1). The median difference between the largest and smallest 24 hour losses was 51g, IRQ 16-95. The first 24 hour pad loss (day 1) was not significantly different from the average 24 loss over the 7 days (median 17.5, IQR 8-60 versus 23.0, IQR 10-65; Wilcoxon's p=0.40). There was significant differences between the first 24 hour losses and the largest of the 24 hour losses (median 52.4, IQR 21.44-148.1, p<0.0001), indicating that a single 24 hour loss did not represent the worst leak. Likewise there was significance in the difference between the average loss over 7 days and the largest loss on the 1 hour test (p<0.0001).

When comparing the 1 hour with 24 hour pad tests, 13 (16%) women were dry on their first pad test and a further 9 were dry on a second pad test , but were proven to be incontinent on the first 24 hour pad test (>8g) in 17 (75%)cases . All of these women who were 'dry' on 1 hour testing were incontinent after 72 hours of pad testing. The larger of the two 1 hour pad tests correlated with the largest single 24 hour pad loss (Spearman's rank correlation, r=0.46, p<0.0001. On the basis of the largest 1 hour pad test, 57% of the women had mild (2-10g) incontinence 24% had moderate incontinence (10-50g) and 19% had severe incontinence (>50g).

As the variability of the 24 hour data was large, we decided to use the largest 24 hour pad loss to assign mild, moderate and severe categories according to the percentage of women so defined on their 1 hour pad testing. When categorised in such fashion 47% of women had largest 24 hour losses of 50g, 30% 51-150g and 23% losses of >150g . In 43(68%) of women, the largest 24 hour losses occurred on the day that she recorded greatest provocation factors.

Urodynamic diagnosis did not appear to influence the largest 24 hour pad losses or the difference between the largest and smallest 24 hour pad test losses and there was no stastically significant diference in these parameters between women with genuine stress incontince and detrusor instability (Mann Whitney, p>0.005).

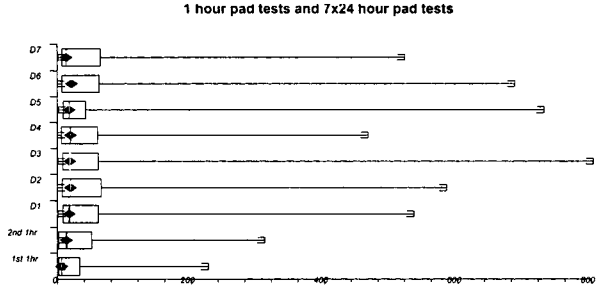

Fig. 1

Agreement analysis was performed on the 7x24 hour data revealing adequate test-test reliability (F=22.2, P<0.0001, one-way ANOVA)[7]. There was no significant difference between

Conclusion

- The 24 hour pad test shows considerable variation from day to day
- The 24 hour pad test is a more sensitive test of incontinence compared to the 1 hour pad test, the sensitivity increasing with repetition of the 24 hour test, possibly being most sensitive at 72 hours of testing.
- A single 24 hour pad test at random does not predict the worst loss
- Performing a 24 hour pad test on the days the patient anticipates the worst loss would be the sensible and practical way of detecting and assessing the degree of incontinence.

- We have now defined the severity categories for the 24 hour pad test as Mild (9-50g), Moderate (50-100g) and Severe (>100g).

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

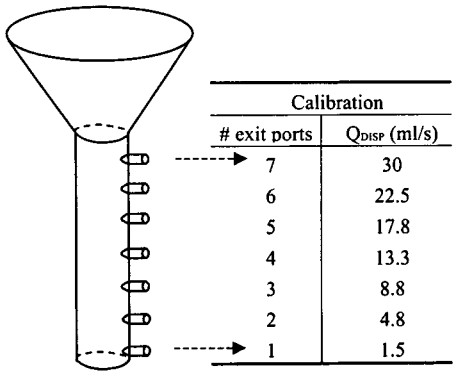
A DISPOSABLE FLOW METER

AIMS OF STUDY

To investigate the urinary stream of a patient, a number of different flow meters have been developed [1]. Due to the costs involved, most devices are only used in the clinic. Recently, the stream cup was introduced as a low cost and easy access device [2]. It consists of a plastic cup with an exit port and evaluates if the maximum flow rate exceeds 12 ml/s or not. In the present study, we developed an inexpensive disposable flow meter to grade the maximum flow rate in a large number of classes. We compared this disposable with a conventional flow meter (Dantec®).

METHODS

The disposable flow meter (patent pending) consists of a small funnel connected to a test tube. 7 exit ports, each 10 mm apart, were made in the tube, see fig. 1 for a schematic drawing. A stream of fluid directed at the funnel exits through a number of exit ports: the higher the flow rate, the more ports are active. In a first test, we calculated the average flow rate value of the uncertainty interval associated with each exit port, see the calibration table. At flow rates higher than 30 ml/s, all seven ports are active. In a second test, 7 healthy volunteers (2 females and 5 males) privately voided several times in a conventional flow meter, to measure the maximum flow rate, Q_{MAX}, and in the disposable flow meter. The disposable was placed in a measuring cup to measure the voided volume and all volunteers counted the number of exit ports active during voiding. Using this number, the average flow rate, Q_{DISP}, was selected from the table. This value was compared to Q_{MAX} using a difference plot [3].



Calibration	
# exit ports	Q_{DISP} (ml/s)
7	30
6	22.5
5	17.8
4	13.3
3	8.8
2	4.8
1	1.5

Fig. 1 Schematic drawing of the disposable flow meter. To compare flow rates measured with the disposable and with a conventional flow meter, we associated the exit ports with the flow rate values, Q_{DISP}, shown in the calibration table.