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

CAN NON-INVASIVE BLADDER MEASUREMENTS IDENTIFY MEN WITH BLADDER OUTFLOW OBSTRUCTION ?

Aims

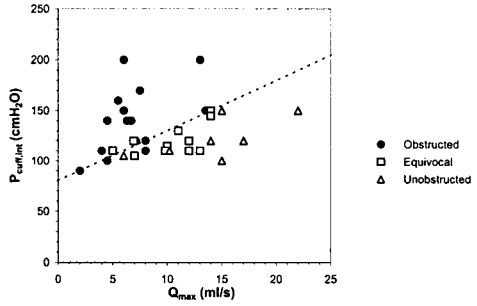
We are continuing to develop a non-invasive technique for measurement of bladder contraction pressure during voiding. The method involves progressive interruption of flow by inflation of a penile cuff, which gives continuous data of cuff pressure and flow rate up to the point where flow is interrupted. Previous work has demonstrated that cuff pressure during inflation is equivalent to urethral pressure [1], and that cuff pressure at interruption of flow correlates closely with isovolumetric bladder contraction pressure [2]. We now present the results of plotting cuff pressure at interruption of flow against maximum flow rate for men classified as *obstructed*, *equivocal* or *unobstructed* according to the provisional ICS method for definition of obstruction [3].

Methods

Data were obtained from 32 men with lower urinary tract symptoms and from 7 asymptomatic volunteers. In each case a conventional medium fill cystometrogram (CMG) was first performed using an 8 Fr double lumen catheter (MediPlus Ltd, UK). For each subject, values for Q_{max} and $p_{det,Qmax}$ were obtained from the CMG and plotted on the provisional ICS nomogram. The bladder was then refilled and the previously described non-invasive bladder pressure test carried out [1, 2]. Briefly, a cuff was fitted round the penis: once voiding had commenced, the cuff was inflated in steps of 10 cm H_2O at intervals of 0.75 s. The test was terminated when flow was interrupted or a pressure of 200 cm H_2O reached. Cuff pressure was plotted against flow rate (allowing for the delays in the flow meter), in order that the cuff pressure at which flow ceased ($p_{cuff,int}$) could be determined. For each subject, the value of $p_{cuff,int}$ was then plotted against the corresponding value of Q_{max}, the maximum flow rate recorded during the cuff test.

Results

Data from 6 subjects were excluded from the analysis: 1 failed to void, 2 strained excessively, and 3 were studied using a narrow cuff which we now know to be unreliable [1]. Using the conventional CMG data, the ICS nomogram classified 15 of the remaining subjects as *obstructed*, 11 (including 4 volunteers!) as *equivocal*, and 7 as *unobstructed*. A graph of $p_{cuff,int}$ versus Q_{max} for these 33 subjects is given in the figure.



Conclusions

The graph shows a clear differentiation between *obstructed* men lying to the upper left, with *equivocal* or *unobstructed* men to the lower right. The line drawn emphasises this distribution. The intersect of the line of division at 80 cm H_2O compares with a value of 40 cm H_2O in the ICS nomogram. We believe this difference is

accounted for by the following components: abdominal pressure, height difference between cuff and bladder, and the fact that the stepped cuff inflation will overshoot by an average of 5 cm H_2O. The increased gradient of the line is consistent with the expected greater difference between isovolumetric pressure ($p_{ves,iso}$) and $p_{ves,Qmax}$ for higher flow rates [4, 5]. We conclude that non-invasive voiding studies using the cuff inflation technique can provide useful information on obstruction.

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

THE RECOMMENDED SCORING SYSTEM FOR THE SHORT-FORM ICS*male* QUESTIONNAIRE: SEPARATE VOIDING AND INCONTINENCE DOMAINS

Aims of study

The ICS*male* questionnaire was developed to assess symptom occurrence and bothersomeness among men with lower urinary tract symptoms (LUTS) related to benign prostatic enlargement (BPE). It has been shown to be valid, reliable and responsive to change,[1,2] but the requirement to analyse each question separately has made it an unwieldy measure. The aims of this work were (a) to produce a simple and concise scoring system that omitted duplicate or redundant items and took into account sensitivity to change and degree of problem caused by LUTS, and (b) to test the internal and external validity, reliability and responsiveness of the scoring system.

Methods

Two data sets were used:

1. Data from the *CLasP* randomised controlled trial comparing TURP, non-contact laser therapy and conservative management (CM - monitoring with no active intervention) in 340 men with uncomplicated BPE[3] were used to devise the scoring system. Parallel analyses were undertaken to identify redundant items and underlying dimensions. Sensitivity to degree of problem caused and sensitivity to change were examined for each item, and factor analysis and Cronbach's alpha coefficients were employed to investigate groupings of baseline symptoms that could be combined in a score. Redundant and insensitive items were omitted from the final factor analysis. The internal validity of the scoring system was investigated in terms of comparisons of the distributions of scores at baseline and follow-up in each of the treatment groups using regression models. Correlations between ICS*male* and I-PSS scores were computed.

2. Data from the 317 men followed up in Phase II of the ICS-'BPH' study of men with LUTS were used to examine the external validity of the scoring system. ICS*male* scores were investigated using regression models to compare patient groups according to treatment received – TURP, minimally invasive therapies, drug therapies and watchful waiting.

All patients completed the 23-item developmental version of the ICS*male* questionnaire at baseline and follow up (mean 8 months after randomisation in *CLasP*, 16 months in ICS-'BPH' study).

Results

Devising the score: Five items were found not to be sensitive to the degree of problem caused, not to change following active treatment, and not to load highly in the initial factor analysis: bladder pain, sitting