

IPSS: DOES IT RELATE TO AN OBJECTIVE SCORE DERIVED FROM MULTIPLE HOME FLOW DATA?

Hypothesis / aims of study

The International Prostate Symptom Score (IPSS) questionnaire is commonly used in clinical practice to assess the efficacy of benign prostatic enlargement (BPE) treatments. However, simple objective urological measurements such as maximum flow rate (Q_{max}) are known to be poorly correlated with urinary symptoms scores¹. Certainly, an important consideration when assessing a treatment is how the patient views their symptoms, but if the IPSS score can be influenced by the patient’s memory, mood that day or their understanding (or misunderstanding) of the questions, would an objective IPSS equivalent be beneficial?

We have developed a simple, low-cost, electronic urine flowmeter designed for home use over 1-2 weeks. The flowmeter acts as an electronic voiding diary and records the full uroflowmetry trace of each void, the detail of which enables us to recognise and quantify the 7 IPSS urinary symptoms and thus calculate an ‘objective’ equivalent flowmeter score.

Study design, materials and methods

26 patients suffering from lower urinary tract symptoms (LUTS) were recruited from a prostate assessment clinic, of which 18 completed the study. Each participant gave written informed consent. The patients, who had been prescribed medication for suspected bladder outlet obstruction, used our flowmeter in their homes for one week before and one week after a 4-week course of α -blocker. Each patient also completed an IPSS questionnaire before and after the course of medication.

Data from the flowmeter were downloaded to a computer and purpose-made software used to calculate Q_{max} , voided volume (V_{void}), date and time and produce a flow trace for each void (Figure 1). This information was then checked visually and used to derive pre- and post-medication flowmeter scores (Table 1). For example, if a patient recorded 30 voids during 1 week, of which 17 had $Q_{max} < 10\text{m/s}$, their weak stream score would be 4 as $17/30 = 0.57$, equating to ‘more than half the time’.

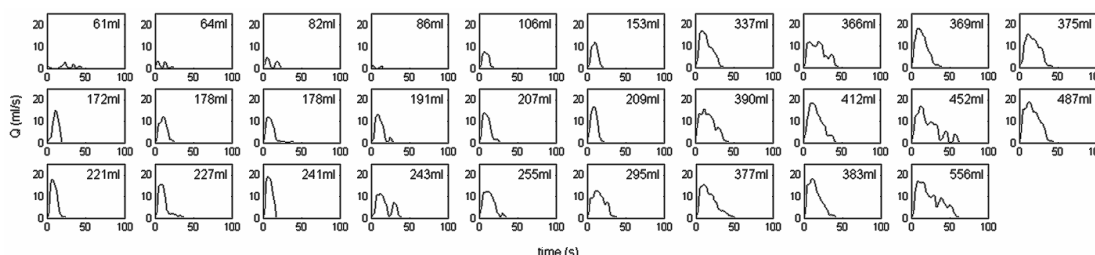


Figure 1: 1 week of flow traces obtained from 1 patient using our flowmeter.

IPSS symptom	Flowmeter trace characteristic
Incomplete emptying	$V_{void} < 200\text{ml}$
Urgency	
Frequency	Voids within 2 hours of a previous void
Intermittency	Voids with significant flow rate fluctuations
Straining	
Weak Stream	$Q_{max} < 10\text{ml/s}$
Nocturia	Voids between 10pm – 7am

Table 1: How we defined each IPSS symptom in terms of data collected by the flowmeter.

Results

Individual patient’s pre- and post-medication IPSS scores correlate moderately ($R^2 = 0.38$) and pre- and post- flowmeter scores correlate well ($R^2 = 0.85$), both showing a trend indicating slight overall improvement of symptoms due to the intervention. However, change in IPSS and flowmeter score showed no correlation ($R^2 = 0.03$), as shown in Figure 2. (‘Change’ is defined as pre-medication score minus post-medication score; a positive change representing an improvement in symptoms and reduction in score.) For 4 patients (marked in red on Figure 2) the changes are in fact in opposite directions!

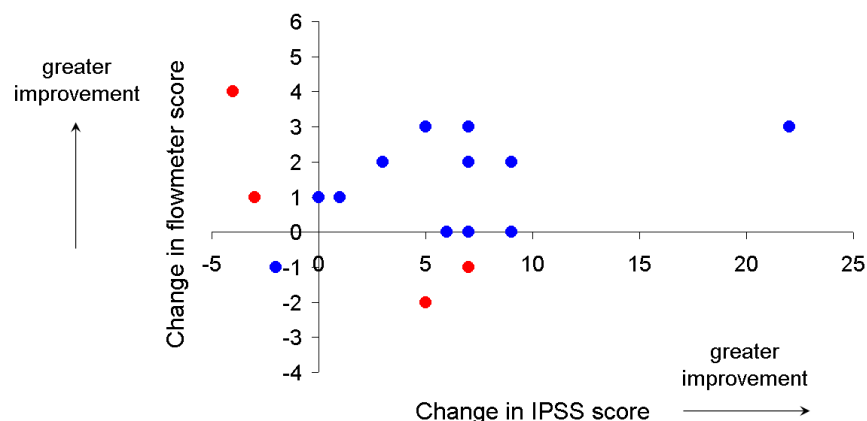


Figure 2: Change in IPSS score versus change in flowmeter score.

Interpretation of results

This outcome is surprising. Although we would not anticipate identical results, we have employed a method to directly quantify the IPSS urinary symptoms and therefore would expect this to correlate to some extent with patient scores.

As illustrated by the axes in Figure 2 the range of change in IPSS score is much larger than that of flowmeter score. This implies that patients overstate their improvement (or decline), perhaps because a slight symptomatic change has a significant effect on their quality of life. One patient's IPSS score dropped from 26 to 4, yet the flowmeter detected only slight symptomatic improvement, for example 82% weak flows compared to 88%. Improvement in IPSS score and exaggeration of improvement may also be due to some behavioural effect. Similarly, a patient expecting treatment to provide symptomatic relief, but experiencing little or no improvement may tend to score negatively.

The IPSS questionnaire asks the patient to score symptoms from 0–5 to indicate how frequently they occur. Although there is an objective definition of each score at the top of the questionnaire, the patient may not fully appreciate this and may select the score based upon how bothersome the symptom is. Additionally, it is difficult to differentiate between, for example, 'less than half the time' and 'less than 1 in 5 times' without knowing actual figures. Issues such as these may lead to inaccurate IPSS scores.

Interestingly, there are some direct contradictions between IPSS score and flowmeter score. For example, one patient gave himself a post-medication Frequency score of 0 signifying that over the past month he had never had to urinate twice within 2 hours, yet the flowmeter recorded 9 voids within 2 hours of a previous void during the week prior to the questionnaire being completed.

Concluding message

Our findings suggest that the IPSS score, rather than accurately indicating the frequency and/or severity of urinary symptoms, is a representation of how the patient feels and their perception of such symptoms.

References

1. Neurourol Urodyn (1998); 17: 99–108

<i>Specify source of funding or grant</i>	None
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Newcastle and North Tyneside 1 Research Ethics Committee
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes