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Quality-of-life assessment in patients after laser prostatectomy

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Objective To determine the importance of the assessment of quality of life in patients who have undergone laser prostatectomy.

Patients and methods Patients undergoing laser prostatectomy were evaluated using the International prostate symptom score (IPSS) questionnaire, uroflowmetry, post-void residual volume (PVR) measurements, and quality-of-life (QOL) and sexual function questionnaires.

Results In all, 103 patients were evaluated; there was an overall significant improvement in the mean IPSS, maximum flow, PVR and QOL score and no apparent subjective change in sexual function. There was a

good correlation between the IPSS and the QOL score, but no correlation between the QOL score and the maximum flow rate, and only a weak correlation between the IPSS and the maximum flow rate.

Conclusion Laser prostatectomy significantly changed the patients' quality of life. This may be more important for the patient than the improvement in the voiding variables alone. In future (changes in) quality of life will probably contribute significantly to selecting patients with voiding complaints for particular treatments.

Keywords Laser prostatectomy, prostatic hypertrophy, quality of life

Introduction

BPH is a common condition among elderly men, with an estimated prevalence of up to 85% [1]. BPH can cause BOO, with a wide range of symptoms varying from only mild voiding or filling complaints to recurrent urinary tract infections, acute retention or even renal failure. Most patients will visit their physician with mild to moderate complaints of urinary difficulties, i.e. LUTS. The influence of LUTS on the patients' daily activities and consequently on their quality of life will induce patients to demand treatment. As men do not always perceive their LUTS as a problem, the prevalence of symptoms in the community is higher than the number of men who seek medical or surgical attention [2,3]. Thus, besides the presence of symptoms, bothersomeness of these symptoms seems to play an important role in the diagnosis and treatment of patients with LUTS. Several studies noted the importance of a 'bother' score of several symptoms, and a correlation between these bother scores, symptom scores and quality of life was established [4,5].

For decades, the only treatment options for men who were seeking help for LUTS caused by BPH were TURP or open prostatectomy. During the last 10 years several alternative treatments have been introduced; these new treatment options were evaluated for their efficacy using

symptom scores and objective measurements, including uroflowmetry, measurement of post-void urinary residual volume (PVR) and sometimes urodynamic investigations with pressure-flow studies. There are few publications describing the effect of particular treatments on the patients' quality of life. One alternative therapy in the treatment of BPH is the use of laser energy; this treatment option has been evaluated extensively and the improvement in symptom scores and uroflowmetry values are comparable with TURP [6–8]. However, little is known about the effect of laser treatment of the prostate on quality of life. In the current study, patients were evaluated before and after laser treatment with quality-of-life (QOL) and sexual function questionnaires, symptom scores and the objective measurements of uroflowmetry and PVR.

Patients and methods

From December 1993 to June 1995, 103 patients with LUTS and BPH underwent a laser prostatectomy. Two different side-firing laser devices were used, the Urolase (CR Bard, Covington, USA) and the Ultraline (Hereaus Lasersonics, Milpitas, CA, USA) fibre. All patients were evaluated at baseline with a history, physical examination including a DRE, laboratory investigations including PSA level, urine culture and urine analysis. Symptoms were evaluated using the IPSS, a QOL questionnaire and a sexual function questionnaire. The IPSS

was the Dutch translation of the AUA-7 questionnaire and details the symptoms in the filling and voiding phases. The last question concerns the effect of these voiding complaints on quality of life. The QOL questionnaire (Appendix 1) consists of three parts: part A contains six questions about the general impact on the patient's life and quantifies some symptoms (score range 6–24); part B contains five questions about the bothersomeness of specific symptoms (range 5–25); and part C contains only one question about general improvement or deterioration over the last month (range 1–5). The sexual function questionnaire (Appendix 2) enquires about changes in sexual function after the laser treatment.

Patients also underwent TRUS of the prostate to document any abnormalities; in cases suspicious for prostate cancer, TRUS-guided biopsies were taken. The prostate volume was measured using the ellipsoid formula. To document changes in voiding variables after laser prostatectomy, uroflowmetry studies, including the measurement of PVR, were performed. Patients were evaluated at baseline and at 3, 6 and 12 months after treatment. The sexual function questionnaire was re-evaluated at 3 and 12 months.

With the Urolase fibre (a non-contact fibre mainly causing coagulation necrosis) the four-quadrant technique was used: 40 W were delivered for 90 s at the 2, 5, 7 and 10 o'clock position of the lateral lobes and an enlarged middle lobe was treated with one or two laser application(s). The Ultraline fibre was used to deliver the laser energy in a dragging ('painting') technique, with the fibre in contact or non-contact mode. During this 'painting', the power was set to a continuous 60 W, aiming at both coagulation necrosis and vaporization at this power setting. As earlier studies showed no differ-

ences in clinical outcome using the Ultraline or the Urolase fibres, the results were analysed together [9].

Differences of age, uroflowmetry data or PVR between patients who completed all the questionnaires at follow-up and patients who did not were tested for significance using the Wilcoxon test at each assessment. Correlations were assessed using the Spearman rank correlation test, changes after laser prostatectomy using a two-way ANOVA with an appropriate Tukey's contrast test for each variable separately. The independent variables were patient and day of assessment, and the dependent variables were uroflowmetry variables and the sum scores of the different questionnaires.

Results

There were no significant differences at baseline for any symptom score between patients who completed all the questionnaires at all times and patients who did not. There were no significant differences in the improvements of uroflowmetry values between patients who completed the IPSS at all times and patients who did not. However, patients who completed the QOL questionnaire at all times had a significantly higher maximum flow rate (Q_{max}) 3 months after treatment than patients who did not, although there was no difference at 6 and 12 months after treatment.

IPSS and QOL questionnaires

The values for the assessed variables and the number of patients completing the questionnaires at each follow-up are shown in Table 1. At 6 months post-operatively, only three patients (3%) did not have an improved IPSS, only nine of 61 patients (15%) did not improve in QOL

Table 1 Values of the variables assessed at baseline and after laser treatment of the prostate (mean [SD] [range])

	Baseline	Follow-up (months)		
		3	6	12
IPSS	21.3 (5.6) [11–35]	8.0 (5.5) [0–23]	6.2 (5.5) [0–35]	5.4 (4.4) [0–20]
<i>n</i>	101	95	99	89
QOL (IPSS)	4 (0.95) [1–6]	1.7 (1.5) [0–6]	1.3 (1.2) [0–4]	1.1 (0.9) [0–3]
<i>n</i>	67	56	61	52
QOL (all)	25.2 (6.3) [11–40]	18.2 (6.5) [11–37]	15.1 (5.0) [11–37]	13.8 (3.5) [11–26]
Part A	12.3 (3.2) [6–21]	9.9 (3.5) [6–21]	7.9 (2.5) [6–16]	7.2 (1.8) [6–14]
Part B	12.9 (3.9) [5–21]	8.3 (3.6) [5–22]	7.2 (2.9) [5–21]	6.6 (2.1) [5–14]
Part C	3.4 (0.7) [2–5]	1.5 (0.9) [1–5]	1.9 (1.1) [1–5]	2.5 (0.9) [1–4]
<i>n</i>	86	82	83	74
Q_{max} (mL/s)	7.9 (3.0) [2–15]	19.1 (6.9) [5–45]	17.2 (6.5) [3–37]	17.7 (7.5) [5–40]
<i>n</i>	102	100	97	92
PVR	84 (80.9) [0–385]	27.6 (36.6) [0–200]	16.4 (31.0) [0–200]	25.6 (37.6) [0–165]
<i>n</i>	102	99	91	86

score and only six of 83 (7.2%) did not improve in the sum score of the QOL. Overall, there was no significant change in how the patients experienced their sexual function 3 and 12 months after treatment compared with the assessment at baseline. Of the 35 patients who said there was a change 3 months after laser prostatectomy, 21 (60%) said there was an improvement and 14 (40%) that there was a deterioration in sexual functioning. One year after laser prostatectomy, there were 17 patients of a total of 30 who stated that there was an improvement and 13 that there was a deterioration in sexual functioning.

There was a significant improvement in Q_{\max} and PVR from baseline to the 3 month follow-up (Table 1), but no statistically significant difference between the values at 6 and 12 months after treatment. Six months after treatment only seven of the 97 patients (7.2%) had no improvement in Q_{\max} .

Using the Spearman rank correlation test, there was a significant correlation between the sum score of the IPSS and the separate scores of part A and B of the QOL questionnaire ($r=0.50$ and $r=0.56$, $r=0.64$ and $r=0.62$, $r=0.50$ and $r=0.63$, $r=0.59$ and $r=0.61$, respectively, at baseline, 3, 6 and 12 months after laser treatment; Fig. 1). The IPSS QOL question also correlated well with the sum score of the IPSS, and with the scores of part A and B of the QOL questionnaire (respectively $r=0.66$, $r=0.51$ and $r=0.56$ at 6 months; Fig. 2). There was a significant correlation at all evaluations. Apart from a weak correlation ($r=0.39$) between the IPSS and Q_{\max} at 6 months, there was no correlation of the IPSS and QOL scores with Q_{\max} at baseline or follow-up. Moreover, the changes in the IPSS sum score and the total QOL sum score after laser treatment showed no relationship with the change in uroflowmetry variables (Fig. 3).

Discussion

The degree to which a patient is bothered by urinary difficulties, rather than symptoms *per se* or the degree of the decrease in flow rate, may be the most important influence on whether a patient decides to seek medical attention for the problem. Whether treatment is advantageous when there are significant objective findings of obstruction but little impairment in the quality of life or vice versa is not clear. Several reports stress the importance of the bother of LUTS and the effect of that on quality of life [4,10,11]. Fowler *et al.* found that men who are bothered by symptomatic BPH are most likely to experience a dramatic improvement after TURP [12]. Therefore, studies on the effect of treatment in patients with LUTS and BPH must use symptom questionnaires, and especially bothersome and QOL questionnaires, in

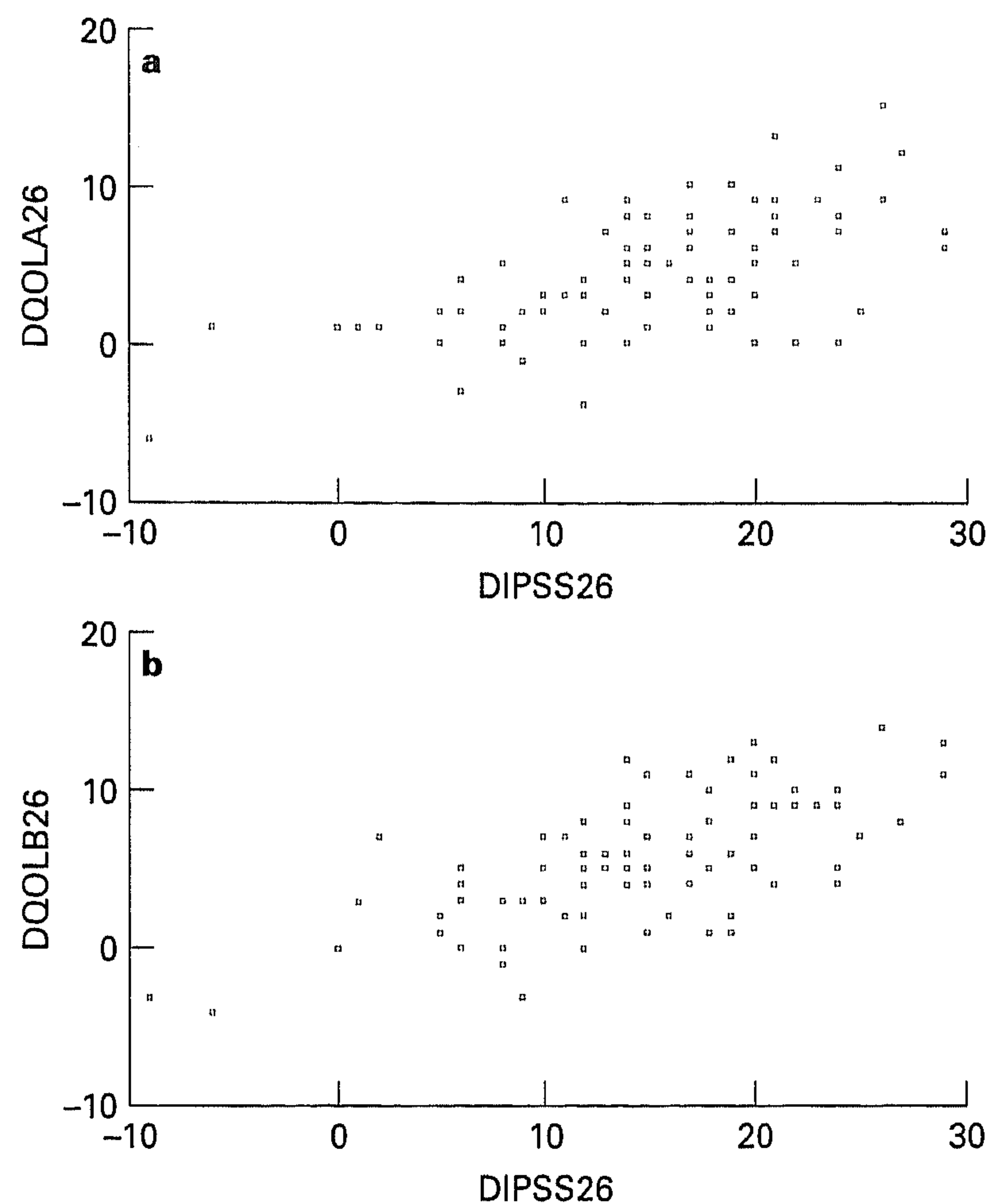


Fig. 1. The relationship between the improvement in IPSS (DIPSS26) and the QOL score, a, part A (DQOLA26) and, b, part B (DQOLB26) at 6 months.

addition to objective assessments such as uroflowmetry and pressure-flow studies.

In a study by Sagnier *et al.* [10] the IPSS sum score was highly correlated with the AUA bother score ($r=0.85$) and the separate QOL question of the IPSS correlated well with the AUA bother score ($r=0.60$). A good correlation ($r=0.74$) was also reported between the IPSS sum score and the separate QOL question of the IPSS [11]. In the present study, there was also a significant correlation between the sum score of the IPSS and the separate scores of part A and B of the QOL questionnaire. Furthermore, from the literature, there seems to be only a weak correlation between symptom scores and uroflowmetry values in a community-based sample of men [13] and in men with clinically diagnosed with BPH [14]. In the current study there was a weak correlation between the sum score of the IPSS and Q_{\max} only at 6 months after laser treatment; there was no correlation at the other evaluations. There was also no correlation between the sum score of the QOL questionnaire and Q_{\max} at baseline and follow-up. Despite this observation, there was a significant improvement in all these variables after laser prostatectomy (Table 1).

There are few reports of changes in quality of life after treatment for LUTS. A prospective study of the treatment choices for BPH in 546 patients suggested that men

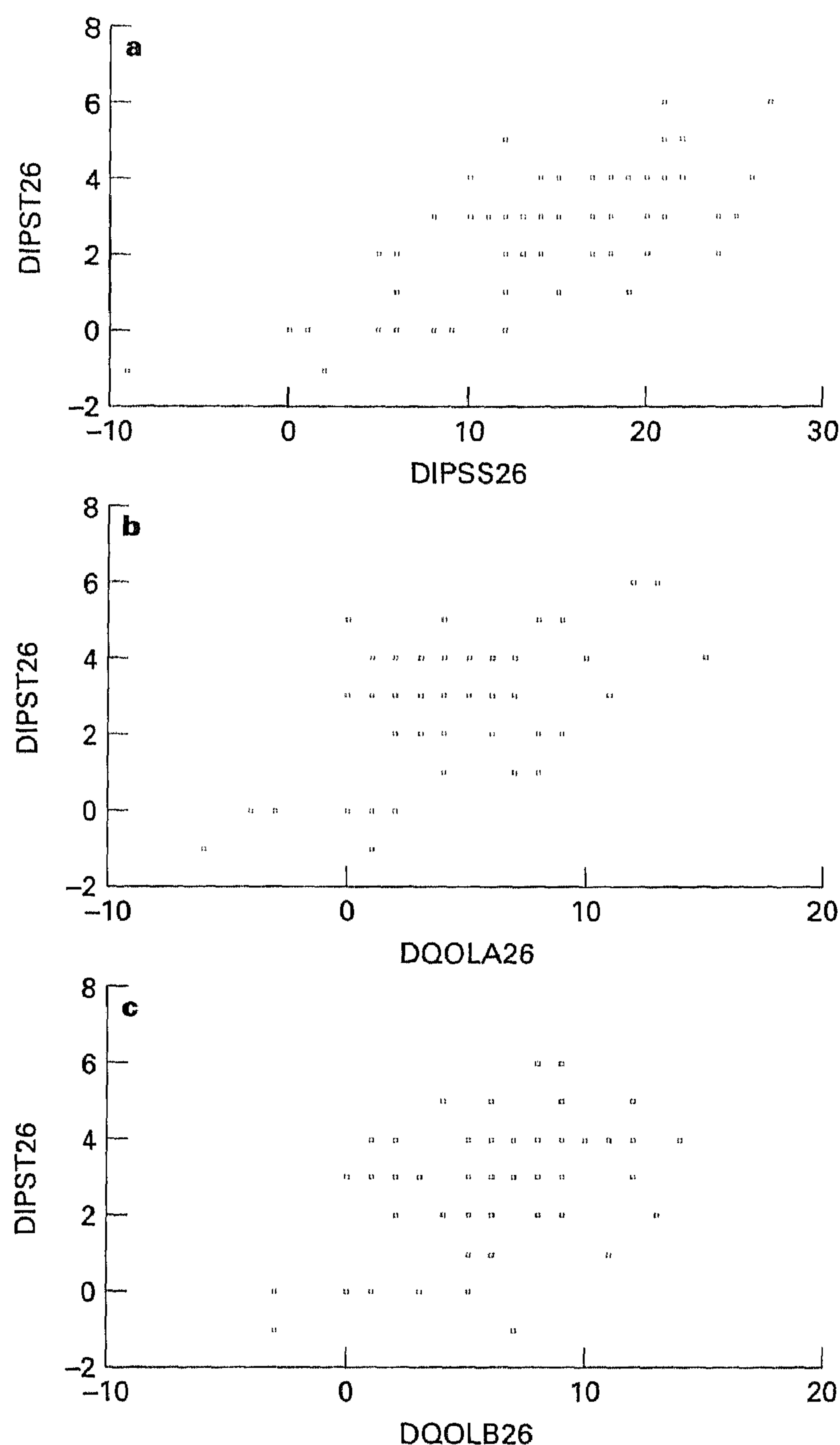


Fig. 2. The relationship between the improvement in the single QOL question of the IPSS (DIPST26) and, a, the IPSS (DIPSS26), b, the QOL score part A (DQOLA26) and, c, the QOL score part B (DQOLB26) at 6 months.

with the same level of symptoms may not be equally bothered and that patients' perception of quality of life must be considered when treatment options are selected [15]. In an uncontrolled study, at least 60% of consecutive surgical patients reported that the primary reason for selecting prostate surgery was symptom reduction and improvement in quality of life [16]. Lukacs *et al.* [17] reported improvements in patients' quality of life after treatment with an alpha blocker, although this study was uncontrolled. Emberton *et al.* [18] examined the effect of prostatectomy on symptom severity and quality of life, concluding that changes in symptom severity were highly correlated with bothersomeness and disease-specific quality of life. They stated that prostatec-

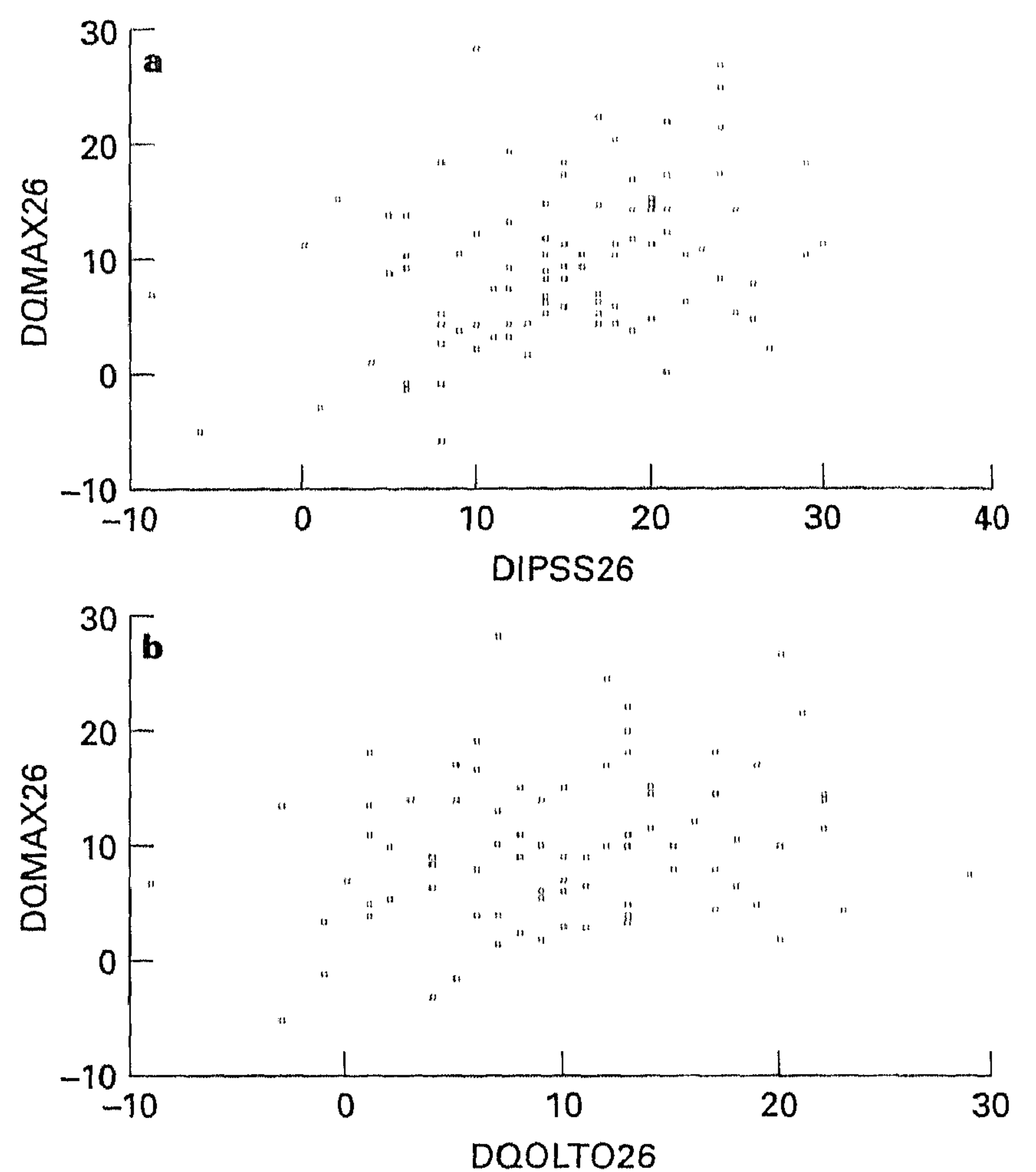


Fig. 3. The relationship between Q_{max} (DQMAX26) and, a, the improvement in IPSS (DIPSS26) and, b, the sum score of the QOL questionnaire (DQOLTO26) at 6 months.

tomy is effective in reducing symptoms in most men and that men who experienced a substantial reduction in symptoms were more likely to report a favourable outcome. To our knowledge, the current study is the first to report on quality of life after laser prostatectomy. The QOL data have limitations, because QOL questionnaires are not yet validated; indeed, the Third International Consultation on BPH could not recommend a QOL questionnaire [19]. We appreciate that a validated international bothersome and QOL questionnaire must be developed. Because there appeared to be a good correlation between the single QOL question of the IPSS and the QOL questionnaire used in this study, the former may be sufficient to adequately document changes in the quality of life in these patients. However, although there was a significant correlation between the IPSS QOL and the sum score of the IPSS, and with parts A and B of the QOL questionnaire, the correlation was too weak to confirm that the IPSS QOL could replace the more detailed questionnaire. Moreover, several studies have shown that there are geographical or cultural differences in the prevalence of symptoms, and in symptom severity. Guess *et al.* [20] showed a difference in the prevalence of symptoms between Scottish men and men from Minnesota; the former reported fewer symptoms but a slightly more bother was associated with a given level

of symptoms. Also, the ICS-BPH study concluded that in various countries, specific LUTS may present distinctively [21]. The perception of specific LUTS appeared to be associated with the country of origin. As a result, it is likely that each country, with its own cultural background and specific healthcare delivery system, must validate the efficacy and QOL aspects of new treatment modalities for LUTS.

In conclusion, this study showed only a weak correlation between symptom score and uroflowmetry variables, no correlation between QOL and uroflowmetry data, and a strong correlation between QOL and symptom scores. Laser treatment of the prostate changes not only the objective variables but also the quality of life. The latter may be more important for the patient than the increase in Q_{max} . In future, QOL questionnaires and the bothersomeness of particular symptoms will probably be more important in selecting patients for treatment of LUTS as a result of BPH than other variables.

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Appendix 1 Patients Quality of Life Questionnaire

Part A

- 1 How many problems do you have with your voiding pattern?
 - 1 None
 - 2 Little
 - 3 Moderate
 - 4 Much
- 2 Do your problems with voiding interfere with your normal daily activities?
 - 1 No
 - 2 Slightly
 - 3 Moderate
 - 4 Much
- 3 Do your problems with voiding interfere with your normal social life?
 - 1 No
 - 2 Slightly
 - 3 Moderate
 - 4 Much
- 4 Did you ever had to void without controlling the time of voiding?
 - 1 Never
 - 2 Yes, 1 or 2 time(s) per month
 - 3 Yes, 1 or 2 time(s) per week
 - 4 Yes, every day
- 5 Did you ever wet your clothes? (because of the urge to void)
 - 1 Never
 - 2 Yes, 1 or 2 time(s) per month
 - 3 Yes, 1 or 2 time(s) per week
 - 4 Yes, every day
- 6 Did you ever wet your bed?
 - 1 Never
 - 2 Yes, 1 or 2 time(s) per month
 - 3 Yes, 1 or 2 time(s) per week
 - 4 Yes, every day

Part B

For the next questions you must choose one of the answers which will show how troublesome the problem in that question was over the last month.

- 1 Terminal dribbling or wetting your clothes
 - 1 No problem

- 2 Very small problem
- 3 Small problem
- 4 A problem
- 5 Large problem

- 2 Unpleasant sensation of a full bladder
 - 1 No problem
 - 2 Very small problem
 - 3 Small problem
 - 4 A problem
 - 5 Large problem
- 3 Fear that you cannot void when you have a full bladder
 - 1 No problem
 - 2 Very small problem
 - 3 Small problem
 - 4 A problem
 - 5 Large problem
- 4 Concern about the long distance you have to cover before you can void
 - 1 No problem
 - 2 Very small problem
 - 3 Small problem
 - 4 A problem
 - 5 Large problem
- 5 Being embarrassed about having to go to the toilet very frequently
 - 1 No problem
 - 2 Very small problem
 - 3 Small problem
 - 4 A problem
 - 5 Large problem

Part C

- Are your voiding complaints over the last 2 to 3 months
- 1 Very deteriorated
 - 2 Slightly deteriorated
 - 3 Unchanged
 - 4 Slightly improved
 - 5 Very improved

Appendix 2 Sexual function questionnaire

- 1 Did the laser treatment change your sexual life?
 - 1 No
 - 2 Yes
- 2 If you answered yes, you find it
 - 1 Satisfying
 - 2 Rather satisfying
 - 3 Rather unsatisfying
 - 4 Unsatisfying