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Comorbidity between chronic prostatitis and overactive bladder in men with benign prostatic hyperplasia – a clinical observational study

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Hypothesis / aims of study

A specific group of patients in dire need of new and better treatment options are those who suffer from diseases that affect the lower urinary tract (LUT), especially patients with chronic prostatitis (CP). Both diagnosis and treatment of patients with CP is challenging, due to uncertain diagnostic criteria and heterogeneous symptoms.

In recent experimental animal studies it was shown that CP can cause changes in bladder function [1]. In patients with benign prostatic hyperplasia (BPH), micturition problems are usually explained as due to prostate enlargement and urethral narrowing [2].

That there is a correlation between BPH, and micturition problems is already clear. If this is due solely to urethral narrowing, because of prostatic enlargement, prostatic inflammation should not impact this correlation.

In this study, we aimed to investigate possible correlation between histologically proven CP and overactive bladder (OAB) in patients with BPH. Further, we aimed to investigate possible underlying changes in bladder histology.

Study design, materials and methods

Based on a preceding power analysis, for a power of 0.8 ($\alpha = 0.05$, $\beta = 0.2$), 51 men with diagnosed BPH and who, due to problems with LUT symptoms (LUTS), were scheduled to undergo transurethral resection of the prostate (TUR-P) were included in the study. All patients were preoperatively examined with the NIH-CPSI, IPSS, and OAB-V8 questionnaires. Preoperatively, all patients were also examined through routine blood and urine samples, urine culture, prostate specific antigen (PSA), uroflowmetry, postvoiding residual urine volume (PVR), and ultrasound scan. Bladder biopsies were taken during TUR-P in cases where inflammatory changes were seen in the bladder.

Based on the pathological results of resected prostate tissue, the patients were divided into two groups; without (n = 30; Group 1) or with (n = 21; Group 2) CP. Patients with indwelling urinary catheters or patients undergoing intermittent catheterization prior to surgery were excluded from the study, as were patients with prostate or bladder cancer. In both groups it was noted which patients had inflammatory changes in the bladder.

On the 6th week and 6th month postoperatively, all patients were investigated with the NIH-CPSI, IPSS, and OAB-V8 questionnaires. Patients with and without CP were compared statistically according to demographic data, evaluation forms, uroflowmetry findings and test results. All statistical measurements were performed using GraphPad Prism version 10.2.1 (GraphPad Software Inc.). An unpaired t-test was used for statistical comparisons of demographic data, blood test results, uroflowmetry findings, as well as preoperative and postoperative data from the NIH-CPSI, IPSS, and OAB-V8 questionnaires. One-way ANOVA followed by Tukey's correction for multiple comparisons was used for statistical comparisons of multiple datasets from questionnaires, i.e. when comparing preoperative, postoperative 6th week and postoperative 6th month data in both groups. Statistical significance was regarded for $p < 0.05$. The data are presented as mean ± SEM.

Results

Based on pathological examination of the resected prostate tissues, 30 of the included BPH patients did not have CP (Group 1), while 21 patients had concomitant CP (Group 2).

There were no significant differences between the two groups in terms of demographic data, preoperative test results, maximum urinary flow rate (Qmax), or PVR (Table 1). Nor were there any significant differences between the two groups in terms of either preoperative or postoperative NIH-CPSI, IPSS, or OAB-V8 scores (Fig 1).

Table 1. Comparison of demographic data and preoperative test results, maximum urinary flow rate and post-voiding residual urine volume.

	Group 1 (n=30)	Group 2 (n=21)	p value
Age (years)	66.77±1.32	64.15±1.92	0.250
BMI (kg/m²)	24.84±0.56	25.48±0.70	0.478
Hb (g/dl)	13.82±0.23	14.11±0.40	0.516
Plasma creatinine (mg/dl)	1.00±0.08	0.94±0.04	0.500
PSA (ng/ml)	3.43±0.63	2.63±0.40	0.344
Q_{max} (ml/s)	8.43±0.51	7.92±0.76	0.571
PVR (ml)	94.62±21.98	69.29±13.53	0.429

Postoperative total NIH-CPSI scores were significantly reduced as compared to preoperative scores in group 1 (Fig 2a; p<0.0001). Similarly, total postoperative NIH-CPSI scores were significantly reduced in group 2, as compared to the preoperative score (Fig 2b; p<0.0001). Likewise, IPSS scores were significantly decreased postoperatively in both groups (Figure 2c, d; p<0.0001). There was a further significant improvement between the postoperative 6th week and 6th month in group 1 (Fig 2c; p<0.01).

Although OAB-V8 scores showed a trend towards decreasing postoperatively, the only statistically significant improvement was observed at 6 months postoperatively in group 1 (Fig 2e, f; p<0.05).

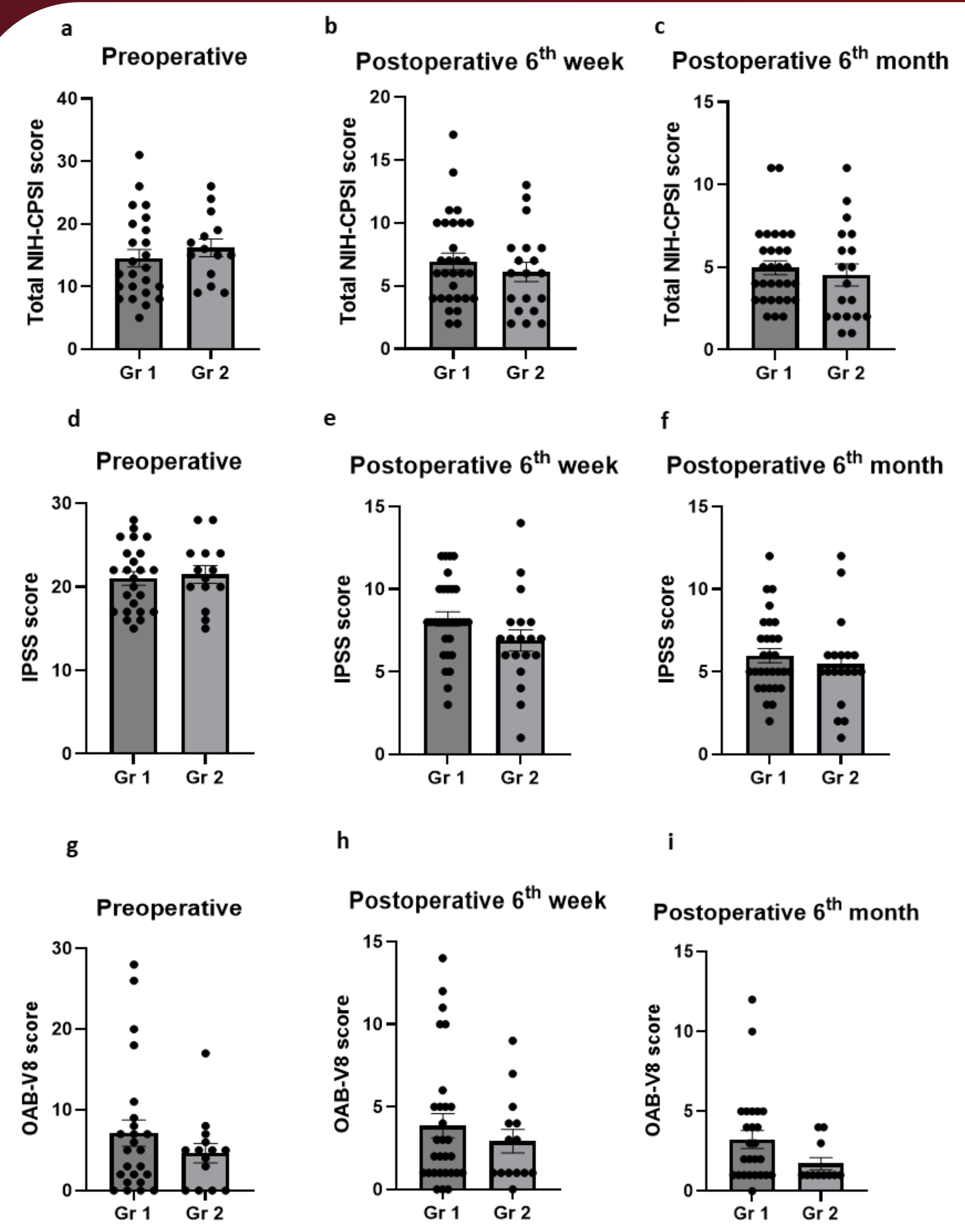

Figure 1. Comparison of preoperative and postoperative total NIH-CPSI, IPSS and OAB-V8 scores.

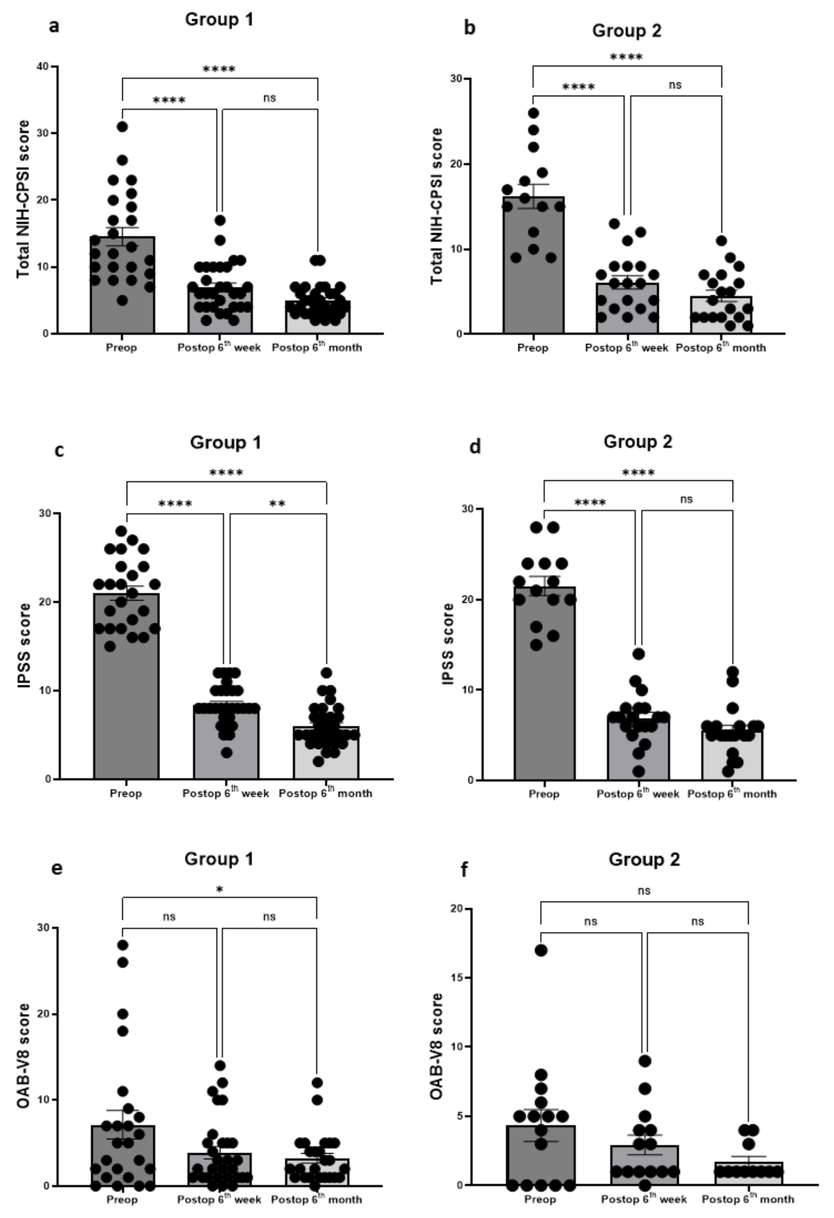

Figure 2. Change in total NIH-CPSI, IPSS and OAB-V8 scores after TUR-P in both groups.

Interpretation of results

The histopathological findings showed that 41% of the patients had CP. This is in line with previous studies, demonstrating a high occurrence of concomitant CP in BPH patients [3]. The current study showed that TUR-P helped to treat LUTS, regardless of whether the patients had CP or not. However, the data also demonstrated that the common changes in bladder function, most often OAB symptoms, could not be treated effectively by TUR-P alone. It should be noted that the postoperative follow-up period for the current study was 6 months and the long-term effect of TUR-P on bladder function needs to be examined in future studies.

The clinical diagnosis of CP is challenging and is especially difficult in patients with concomitant BPH due to common symptoms and similar presentation. Previous studies showed that higher IPSS and PSA levels could be signs of CP in BPH patients. In addition, NIH-CPSI can be used to identify patients with concomitant CP. However, our findings revealed no significant difference between the two groups in terms of PSA levels, IPSS or NIH-CPSI scores. These findings show how difficult it is to identify possible concomitant CP in BPH patients.

Tentatively, a higher degree of inflammation could lead to higher IPSS and NIH-CPSI scores, and higher PSA levels. However, histological grading of prostate inflammation was not performed in this study. Future studies investigating the potential effect of degree of prostate inflammation on IPSS, NIH-CPSI and PSA levels would be beneficiary.

The current study indicates that it is of importance to identify patients with concomitant CP to ensure effective management for patients with BPH and the need for more reliable non-invasive tools to identify CP in BPH patients, who are at high risk of not being treated effectively.

Conclusions

Transurethral resection of the prostate (TUR-P) is an effective method to overcome most of the LUTS due to BPH, regardless of whether the patients has CP or not. However, OAB symptoms in BPH patients with concomitant CP is more difficult to manage with only TUR-P. Thus, identifying concomitant CP in men with BPH plays an important role for the effective management of patients who undergo TUR-P. More reliable, non-invasive tools are needed to better identify patients with CP.

References

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