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The impact of NIH-IV prostatitis on early post-operative outcomes of transurethral resection of the prostate in patients with symptomatic benign prostate hyperplasia

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Aim: Transurethral prostate resection (TURP) is still considered the gold standard in the treatment of symptomatic benign prostate hyperplasia (BPH). Category IV chronic prostatitis (CP) is described by the National Institute of Health (NIH-IV) as the asymptomatic inflammation of the prostate and it may be detected along with benign prostate hyperplasia (BPH) during histological examinations of the prostate. In this study, we evaluate the impact of the presence of NIH-IV defined prostatitis on early post-operative outcomes of transurethral resection of the prostate.

Materials and methods: Between 2004 and 2008, medical records of 247 patients who underwent TURP in Adana Numune Training and Research hospital were examined, retrospectively. Patients who had a histological diagnosis of only BPH were considered in Group 1 whereas Group 2 consisted of patients with both NIH-IV CP and BPH simultaneously. Factors such as total prostate specific antigen (tPSA) levels, International Prostate Symptom Scores (IPSS), single-question quality of life (QoL) assessments, maximum flow rates (Q max), residual urine volumes, catheterization times, re-catheterization rates, and the duration of re-catheterization were compared between these 2 groups. IPSS, QoL, and uroflowmetry measurements were compared between the 2 groups again at the third post-operative month. Statistical analysis with Student's t and chi-square tests was performed with SPSS ® version 16.

Results: Preoperatively, no statistically significant difference was present between the 2 groups with respect to IPSS, Q max, QoL, prostate volume, tPSA, and mean catheterization time ($P > 0.05$); however, re-catheterization rates were significantly different ($P < 0.05$). While meaningful difference was found between 90th day IPSS and QoL medians ($P < 0.05$), there was no difference in Q max medians ($P > 0.05$).

Conclusion: NIH-IV chronic prostatitis shows negative effects on the subjective post-operative results and re-catheterization frequency of BPH patients that have undergone TURP.

Key words: Chronic prostatitis, BPH, TURP, prostate, histology

NIH-IV kronik prostatitin semptomatik benign prostat hiperplazili hastaların transüretral prostat rezeksiyonu sonrası erken dönem sonuçlarına etkisi

Amaç: Transüretral prostat rezeksiyonu (TURP) semptomatik benign prostat hiperplazisi (BPH) cerrahi tedavisinde halen altın standarttır. Kronik prostatit (KP) National Institute of Health -IV (NIH-IV) prostatın asemptomatik inflamasyonu olup histolojik örneklerde BPH ile sıkça birlikte bulunmaktadır. Bu çalışmada KP NIH-IV'ün semptomatik BPH nedeniyle yapılan TURP' ların post operatif erken sonuçlarına etkisini incelenmesi amaçlanmıştır.

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Yöntem ve gereç: Adana Numune Eğitim ve Araştırma Hastanesinde 2004-2008 yılları arasında TURP yapılan 247 hastanın tıbbi kayıtları retrospektif olarak incelendi. Histopatolojiye göre saf BPH olanlar 1. grubu oluştururken KP ve BPH olanlar 2. grubu oluşturdular. Total prostat spesifik antijen seviyesi (tPSA), Uluslararası Prostat Semptom Skoru (IPSS), tek soruluk yaşam kalitesi (QoL), maksimum akım hızı (Q max), sondalı kalma süresi, ve erken tekrar sondalama oranları ve süreleri ile birlikte post-op 90. gündeki IPSS, QoL, Qmax değerleri karşılaştırıldı. istatistiksel analiz Student t ve ki kare testleri ile SPSS® version 16 ile yapıldı.

Bulgular: Preoperatif IPSS, Qmax, QoL, prostat hacimleri, tPSA ve sondalı kalma süreleri ortancaları grup 1 ve 2 arasında anlamlı farklılık göstermedi (P > 0,05). Tekrar sondalama oranları arasında anlamlı farklılık vardı (P < 0,05). Doksanıncı gün IPSS ve QoL ortancaları arasında anlamlı farklılık saptanırken (P < 0,05), Q max ortancaları arasında farklılık yoktu (P > 0,05).

Sonuç: KP NIH-IV semptomatik BPH nedeniyle TURP yapılan hastaların subjektif post-op sonuçları ve tekrar sondalama sıklıkları üzerinde olumsuz etki göstermektedir.

Anahtar sözcükler: Kronik prostatit, BPH, TURP, prostat, histoloji

Introduction

Benign prostate hyperplasia (BPH) is the enlargement of the prostate as a result of the hyperproliferation of stromal and glandular cells with mesenchymal cell predominance. BPH is the most common benign pathology of the prostate in the aging male and was reported to affect 70% and 90% of men aged 61-70 and 81-90 years, respectively (1). BPH becomes clinically relevant when it causes lower urinary tract symptoms (LUTS). The prevalence of LUTS in the over-40 male population of Europe was reported to be 30% (2).

BPH and chronic prostatitis may frequently occur concomitantly (3,4). Although BPH was the cause of LUTS in 20% of the patients, it was reported that LUTS may also be associated with chronic prostatitis (1). Nevertheless, chronic inflammation with BPH is not necessarily symptomatic (3). According to the National Institute of Health (NIH) classification, category IV prostatitis is asymptomatic chronic prostatitis defined by the presence of inflammatory cells in expressed prostatic secretion or in histological prostate specimens (5). NIH-IV prostatitis was reported to be present in 43-98% of histological specimens of resected prostates (6,7).

The goal of surgery for the management of LUTS caused by BPH is to relieve the symptoms associated with bladder outlet obstruction (BOO). Currently, the gold standard therapy for the management of BOO is transurethral resection of the prostate (TURP) (8-11). Although most patients benefit from the surgery and experience relief from their symptoms, there may be a substantial number of patients suffering from continuing LUTS. Thus, satisfactory results in the post-operative period cannot be obtained in every patient. Continuing symptoms may be related to the presence of preoperative prostatic infections, especially NIH-IV prostatitis. In the present study, we aimed to determine whether the simultaneous presence of NIH-IV CP and BPH has any impact on early post-operative symptoms following TURP.

Materials and methods

Between 2004 and 2008, medical records were evaluated for 247 patients who underwent TURP because of symptomatic BPH in Adana Numune Training and Research Hospital. All of the patients were treated by a single surgeon and the evaluation of their files was performed retrospectively. Due to the occurrence of an acute prostatitis episode within 6 months prior to TURP, 17 patients were excluded from the study. Similarly, patients with prostate cancer, stone disease, central and/or peripheral neurologic dysfunction, or a previous history of transurethral instrumentation were also excluded. Patients were divided into 2 groups according to histological diagnosis. Patients who had histological diagnosis of only BPH were put in Group 1 whereas Group 2 consisted of patients with both NIH-IV CP and BPH. Factors such as total prostate specific antigen (tPSA) levels, International Prostate Symptom Scores (IPSS), single-question quality of life (QoL) assessments, maximum flow rates (Q max), residual urine volumes, catheterization times, re-catheterization rates, and the duration of re-catheterization were compared between these 2

groups. IPSS, QoL, and uroflowmetry measurements were compared between 2 groups once again at the third post-operative month.

Statistical analysis was performed using Student's t-test and chi-square tests using SPSS® (version 16, Chicago, USA).

Results

The mean ages of patients in Group 1 and 2 were 68.3 ± 4.0 (51-85) and 68.2 ± 3.0 (51-82), respectively. There was no statistically significant difference (P > 0.05). Of the 230 patients, 29 (12.6%) were in Group 2.

One hundred patients (89.6%) had a history of use of alpha adrenergic blocker therapy while 25 patients in Group 2 (86.2%) reported to use alpha adrenergic blockers preoperatively.

In Group 1, the mean IPSS, Q max, QoL, prostate volume, and total prostate specific antigen (tPSA) levels were 19.3 ± 6.6, 7.9 ± 3.3 mL/s, 5.6 ± 1.8, and 71.1 ± 14.0 mL. For those patients in Group 2 the same numbers were determined at 19.1 ± 6.7, 7.8 ± 3.1 mL/s, 5.8 ± 2.0, and 68.0 ± 13.0 mL (P > 0.05). The mean durations of catheterization time in Groups 1 and 2 were 3.2 ± 0.4 and 3.1 ± 0.3 days, respectively (P > 0.05) (Table 1).

Within the first 24 h after removal of the Foley catheter, 6 patients in Group 1 (2.9%) and 5 cases in Group 2 (17.2%) underwent re-catheterization (P < 0.05) (Table 1). Re-catheterization durations for Groups 1 and 2 are shown in Table 1.

At the third post-operative month, Q max, IPSS, and QoL figures in Group 1 and 2 were 17.2 ± 1.8 mL/s and 17.1 ± 1.6 (P > 0.05), 4.4 ± 0.4 and 6.2 ± 0.6 (P < 0.05), and 2.2 ± 2.0 and 3.8 ± 3.0, respectively (P < 0.05) (Table 2).

Table 1. Comparison of preoperative values of BPH (Group 1) and BPH plus chronic prostatitis (Group 2).

	Group 1	Group 2	P
Preoperative			
n	201	29	
Age (years)	68.3 ± 4.0	68.2 ± 3.0	> 0.05
tPSA (ng/mL)	3.6 ± 0.7	3.6 ± 0.9	> 0.05
IPSS	19.3 ± 6.6	19.1 ± 6.7	> 0.05
Q max (mL/s)	7.9 ± 3.3	7.8 ± 3.1	> 0.05
QoL	5.6 ± 1.8	5.8 ± 2.0	> 0.05
Prostate volume (mL)	71.1 ± 14.0	68.0 ± 13.0	> 0.05
Re-catheterization (%)	2.9	**17.2**	**< 0.05**
Re-catheterization duration (days)	3.2 ± 0.4	3.1 ± 0.3	> 0.05

Table 2. Comparison of post-operative values of BPH (Group 1) and BPH plus chronic prostatitis (Group 2).

	Group 1	Group 2	P
90th day post-operation			
Q max (mL/s)	17.2 ± 1.8	17.1 ± 1.6	> 0.05
IPSS	4.4 ± 0.4	**6.2 ± 0.6**	**< 0.05**
QoL	2.2 ± 2.0	**3.8 ± 3.0**	**< 0.05**

Discussion

This study has shown that in the TURP treated patients with symptomatic BPH, presence of NIH-IV CP caused an increase in IPSS and re-catheterization rates while it caused a decrease in QoL.

BPH is a histological diagnosis and defined as the presence of stromal-glandular hyperplasia within the prostate gland (1,12). The prevalence of BPH is estimated to be around 42% for men between the ages of 51 and 60; this figure reaches as high as 90% for those 81 to 90 years of age (2,13). In fact, BPH was reported to be as prevalent as diabetes mellitus and hypertension in the aging male subgroup (14). BPH is a progressive disease and the condition becomes clinically relevant if it is associated with bothersome LUTS such as urinary frequency, urgency, nocturnal frequency, intermittency, decreased force of stream, or the sensation of incomplete bladder emptying. These symptoms are directly or indirectly caused by the BOO, which is a result of the enlarged prostate compressing the urethra (15). More than 50% of men over 50 years of age experience LUTS secondary to BPH (13).

Frequently, BPH and inflammation coexist. Although the reported incidence of prostatitis in men older than 40 years is reported to be 5%-10% (14), the results from postoperative or postmortem histological studies showed an incidence of inflammation ranging from 30% to 78% in patients with BPH (16-18). Many recent studies point out an association between BPH and prostate inflammation. BPH tissues are rich in chronic inflammatory infiltrates and hyperplastic nodules (13,16-18). A direct correlation with early onset of BPH-LUTS and young onset prostatitis was found. At the same time, an inverse correlation was reported between daily use of non-steroidal anti-inflammatory drugs and the worsening of the LUTS related to BPH (18-20). A Medical Therapy of Prostatic Symptoms (MTOPS) trial indicated that inflamed glands have larger volumes than non-inflamed glands and predispose patients to a higher rate of BPH-BOO related complications such as acute urinary retention (20). A similar association between inflammation and BPH symptom severity was also reported in the Reduction by Dutasteride of Prostate Cancer Events (REDUCE) trial (18,19). Nickel et al. described glandular inflammation as the third and most important component in the pathogenesis of BPH and development of LUTS. This inflammation was suggested to combine both the static (mechanical urethral obstruction) and the dynamic (detrusor hypertrophy and bladder neck smooth muscle failure) components of LUTS (21). As an indirect sign of the association between BPH and inflammation, C-reactive protein (CRP) levels were measured in a previous study. CRP levels were found to be above the limit of detection (>3.00 mg/L) in patients with inflammation and patients with elevated CRP levels were 1.47 times more likely to have 3 or more symptoms than men with a C-reactive protein concentration below the detection limit (22).

In our study, we did not demonstrate any statistically significant difference in preoperative IPSS, Q max, QoL, or tPSA parameters between the 2 groups ($P > 0.05$). Age and prostate volumes are the 2 most important factors which both independently impact the parameters subject to BPH. Neither of these parameters was statistically different between the groups ($P > 0.05$).

At the third month following the surgery, IPSS and QoL measurements showed a significant difference between 2 groups ($P < 0.05$). We did not find any significant difference with respect to Q max levels. This result is not surprising since relieving the obstruction ensures a better Q max in both groups. However, IPSS and QoL figures measure different aspects of patient satisfaction with the surgery. Moreover, prostatitis symptoms are usually irritative and continuing effects of prostatitis after surgery for BPH might contribute to the presence of LUTS and patient discomfort.

We determined that the re-catheterization ratio was significantly higher in Group 2 patients when compared to those from Group 1 ($P < 0.05$). This may be explained by the earlier onset and longer duration of BOO in patients with prostatitis. Another explanation may be that the duration of inflammatory answer was longer because of the underlying inflammation in patients with prostatitis. Resolution of the post-operative edema at the bladder neck may last longer than expected because of this long-acting inflammation.

The primary goal of treatment in patients with symptomatic BPH is to relieve the symptoms

associated with BOO. Although, TURP is the gold standard and reference therapy for symptomatic BPH (8-11), some patients do not benefit from the procedure as expected and LUTS may continue after the surgery. Recently, the MTOPS and REDUCE trials have pointed out a possible association between the inflammation of the prostate and LUTS. Prolonged urinary retention and acute urinary retention were also found to be predisposing conditions leading to insufficient satisfaction rates after TURP surgery (11). As mentioned previously, the early onset of inflammation causes early onset BPH which may lead to prolonged periods of retention. The MTOPS trial reported a comparably high prevalence of acute urinary retention in patients with BPH combined with inflammation (20).

In the present study, NIH-IV CP was shown to have deteriorating effects on the early post-operative results of TURP surgery in patients treated for symptomatic BPH. We believe that it would be useful to review the post-operative expectations of both surgeons and their patients that exhibit both BPH and NIH-IV CP. However, further prospective controlled studies with larger series are needed to effectively document the role of prostatitis in symptomatic relief after surgery for BPH.

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