

TRANSURETHRAL RESECTION SYNDROME IN PATIENTS UNDERGOING TRANSURETHRAL RESECTION PROSTATECTOMY

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ABSTRACT

Background: Transurethral resection of the prostate (TURP) remains the surgical gold standard for the treatment of benign prostatic hyperplasia and clinically it can be complicated by TURP syndrome and electrolytes derangements.

Materials and Methods: This descriptive cross-sectional study was done on 66 patients at department of general surgery, Qazi Hussain Ahmad Medical Complex, Nowshera from January 2017 to January, 2018. Patients above 50 years with lower urinary tract symptoms having International prostate symptoms score >20, postvoid residual volume >100ml, Peak urine flow rate (Qmax) <10ml/sec, Serum PSA <4ng/ml were included in the study for TURP. Postoperative serum sodium levels less than 130 or more than 145 mmol/L and potassium less than 3.5 or more than 5.5 mmol/L, of any one or both were defined as deranged electrolytes. Data was entered and analyzed with SPSS 23.

Results: Electrolytes derangements were noted in 43(65.15%) patients while transurethral syndrome was diagnosed in 8 (12.12%) patients. The mean ages of patients were 65.0 years \pm 5.0 SD and 63.8 years \pm 6.2 SD in normal patients and deranged electrolytes patients respectively while it was 68.7 years \pm 3.1 SD in transurethral syndrome. The overall mean age was 66.78 years \pm 2.40 SD

Conclusion: Electrolyte derangement after TURP is not uncommon and post TURP monitoring of electrolyte should be individualized.

Key words: Transurethral resection of prostate; Transurethral resection syndrome; Electrolytes Derangements

INTRODUCTION

Benign prostatic hyperplasia (BPH) is an enlarged prostate and this hyperplasia is mainly caused by increased prostatic smooth muscle tone and volume. Smooth muscle and non-muscle myosin play important roles in mediating tone and cell proliferation¹. As the man ages, the prostate goes through two main growth periods; first early in puberty during which the size of prostate is doubled and second phase of growth begins around age 25 and continues afterward.²

Benign prostatic hyperplasia (BPH) is age-dependent and appears over the age of forty characterized by formation of large nodules in the prostate gland, which compress the urethra causing an obstruction that leads

to lower urinary tract symptoms (LUTS).³

The pooled prevalence of BPH has been reported to be 26.2% (95% CI: 22.8–29.6%), with estimates differing across studies, because of different BPH definitions, survey methods, response options, geographical locations and sample populations. Despite this, it is found that the prevalence of BPH increases as the patient age increases, from 14.8% in younger males aged 40 to 36.8% in males aged 80 and above.⁴

Lower urinary tract symptoms (LUTS) associated with BPH have negative impacts on a patient's quality of life. As with age the prevalence of LUTS/BPH increases, the burden may increase on the healthcare system due to the ageing population.⁵ TURP is considered the reference standard in the surgical therapy of symptomatic bladder outlet obstruction (BOO) secondary to BPH^{6,7} but complications after TURP are frequent. Early complications include bleeding, sepsis, TUR syndrome, incontinence, and urinary retention. Due to standardization of the procedure, better perioperative management and better anesthetic techniques, the incidence of these complications has decreased considerably^{8,9}. In the early postoperative period, bleeding requiring transfusion, acute kidney injury, and transurethral resection syndrome are the complications that greatly influence morbidity of the procedure and may even lead to mortality^{10,11}. Hypertension due to hypervolemia with reflex bradycardia, T-wave depression on the ECG due to glycine absorption and hyponatremia due to

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hypotonic irrigant absorption are the typical features of transurethral resection syndrome¹².

The incidence of of mild to moderate TUR syndrome has been reported to be in between 0.5% and 8% with a reported mortality rate of 0.2%-0.8%¹³. However in recent larger studies this rate has been reported very low between 0.78% and 1.4%^{14,15}.

The aim of our study was to know about the frequency of electrolytes derangements and transurethral resection syndrome in our patients undergoing TURP for BPH.

MATERIALS AND METHODS

This descriptive cross sectional study recruiting 66 male patients was done at department of general surgery, Qazi Hussain Ahmad Medical Complex, Nowshera from January 2017 to January, 2018. Patients between the age of 50 and above with lower urinary tract symptoms having International prostate symptoms score >20, postvoid residual volume >100ml, Peak urine flow rate (Qmax) <10ml/ sec, Serum PSA <4ng/ml, and absence of carcinoma signs on DRE were included in the study. Patients were admitted from outpatient department of general surgery.

Written informed consent was taken from all patients. Each participant underwent a general physical examination and digital per rectal examination. The IPSS developed by WHO were carefully evaluated. Pelvis ultrasonography was done for post void residual volume and Prostate volume and Uroflowmetry was done for Peak urine flow rate (Qmax). Serum PSA was checked in all patients with cut off value of 4ng/ml. Exclusion criteria were patients with hard nodule on DRE or suspicious of prostate carcinoma, urethral strictures, persistent or recurrent urinary tract infection. Patients with deranged serum electrolytes or renal functions tests were also excluded from the study.

After admission in general surgery ward, patients were prepared for surgery after initial routine preoperative investigations like Full blood count with ESR and C reactive protein, serum electrolytes, blood urea and sugar, renal functions test, hepatitis B and C and HIV screening, ECG and Echocardiography. Pulmonary functions tests were done where required. A single preoperative dose of one-gram Ceftriaxone intravenous was given. Intravenous fluid given preoperatively was ringer lactate. TURP was done under general anesthesia using a continuous flow resectoscope with monopolar diathermy. The solution used for irrigation was 1.5% glycine. One hour after TURP, 5ml blood was collected from each patient for serum electrolytes assessment. Serum sodium and potassium were measured using ion selective electrode method. Prostatic resected tissues obtained at TURP were sent as routine for histopathological study.

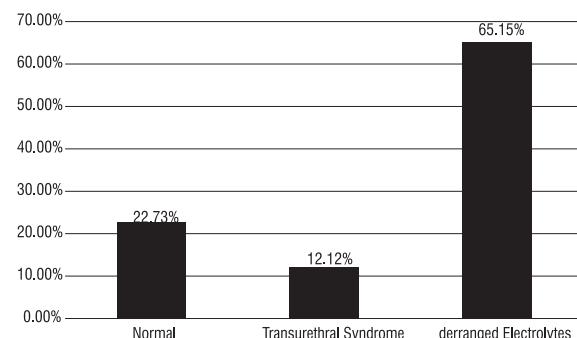
Operative parameters like duration of surgery,

volume of glycine used during surgery, weight of prostatic tissue resected, volume of intravenous fluids given peroperatively and postoperative clinical symptoms were recorded in a predesigned proforma. Postoperative serum levels of sodium less than 130 or more than 145 mmol/L and potassium less than 3.5 or more than 5.5 mmol/L of any one or both were defined as deranged electrolytes. Patients after TURP with hypertension and bradycardia, T-wave depression on the ECG, hyponatremia were labelled as having transurethral resection syndrome.

The data was analyzed with the help of SPSS version 20 and presented in the form of tables.

RESULTS

There were 43(65.15%) patients who showed electrolytes derangements while transurethral syndrome was diagnosed in 8 (12.12%) patients. (Graph No. 1)



Graph No. 1: Frequency of electrolytes derangement and Transurethral syndrome in TURP patients

Table No 2

	Electrolytes Derangement	Transurethral Syndrome	Normal
Mean Age (years) \pm SD	63.8 ± 6.2	68.7 ± 3.1	65.0 ± 5.0
Volume of glycine (Liters)	20.32 ± 2.34	30.65 ± 1.87	15.29 ± 2.76
Weight of prostatic tissue (Grams)	44.69 ± 5.85	50.87 ± 3.98	16.55 ± 8.34
Volume of intravenous fluids (Liters)	1.9 ± 0.8	1.8 ± 0.9	2.1 ± 0.6
Resection time (Minutes)	55.98 ± 1.05	70.90 ± 2.98	45.21 ± 0.76

The mean ages of patients were 65.0 years \pm 5.0 SD and 63.8 years \pm 6.2 SD in normal and deranged electrolytes patients respectively while it was 68.7 years \pm 3.1 SD in transurethral syndrome. The overall mean age was 66.78 years \pm 2.40 SD. Table No. 1

Volume of glycine used during surgery, weight of prostatic tissue resected, volume of intravenous fluids given peroperatively and postoperative clinical symptoms are shown in table No. 1 in detail.

DISCUSSION

Senile prostatic enlargement is one of the most common diseases among the elderly. It is a common problem that affects the quality of life in approximately one third of men older than 50 years¹⁶. TUR syndrome of prostate is one of the commonest and dreaded complications of transurethral prostatectomy with the reported incidence of TURP syndrome up to 20% in the experienced hands with a significant mortality rate¹⁷.

The venous channels in the prostatic bed are responsible for fluid absorption during continuous irrigation leading to changes in serum electrolytes level and is responsible for Transurethral resection syndrome (TUR syndrome)¹⁸. In our study, we noted that 65.15% patients showed electrolytes derangements but no patient was noted with hyperkalemia while transurethral syndrome was diagnosed in only 12.12%. On the other hand, Aziz W et al¹⁹ has observed electrolytes derangements in all patients but with no hyperkalemia.

With the use of 1.5% glycine as irrigant, hemolysis is minimal as compared to other hypoosmolar irrigants like water²⁰. In the literature, TUR Syndrome is reported as 23.5%²¹, 25.15%²², 26.2%²³. It is also reported as low as 10%²⁴.

The mean age of patients with electrolytes derangement was 63.8 \pm 6.2 and in TUR syndrome, it was 68.7 \pm 3.1. With advancing age the vasculature becomes rigid leading to persistent venous channels opening in the prostatic bed²⁵.

In our study, all the patients were having <80 g prostate, but TUR syndrome was observed in patients with larger prostate i.e. 68.7 grams \pm 3.1 SD. It is also reported by Madduri VK et al and Vijayan S^{26,27} that the number and size of venous sinuses in the prostate is mainly responsible for amount of fluid absorption, the number and size increase with the increase in prostate size.

The 12.12% frequency of TUR syndrome in our study was also attributed to the factors that in majority of patients the resection time less than 60 minutes and TUR syndrome was observed in patients when the resection time exceeded than 60 minutes i.e. 70.90 minutes \pm 2.98 SD. the amount of fluid absorption depends on the duration of exposure of the exposed venous sinuses to the irrigating fluid at the prostatic

bed²¹. Also, we avoided deep resection, keep irrigation fluid at height of 60 cm, maintained continuous flow resectoscope, use of isotonic irrigant and bipolar diathermy were contributing factors for low frequency of TUR syndrome.

Limitation of our study is that the current study could not take in consideration other risk factors associated with TUR syndrome in BPH surgery including diet, diabetes, or even body mass index which has substantially changed over the past 3 decades. Similarly, this study could not account for the variation in criteria of BPH that has been revised.

CONCLUSION

A reasonable number of patients develop electrolytes derangement and TUR Syndrome in TURP for BPH. Identification of early symptoms of electrolytes derangements and TUR syndrome is very important and its prevention is essential.

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