

Research Article

Comparative evaluation of TURP saline (Bipolar) versus TURP water (Monopolar) in management of prostatic enlargement, 2015Haider M.E.E. Abdalah^{1*}, Amir Abdullahi Hamza², Nasr Abdalmerged Ramadan³¹Sudan Medical Specialization Board, Khartoum, Sudan.²Department of General Surgery, Faculty of Medicine, University of Bahri.³Urology Department, Medical Corps***Corresponding author****Haider M.E.E. Abdalah**Email: mrhelhafliz@gmail.com

Abstract: Originally sterile water was used as irrigation fluid, but the TURP saline technique was newly introduced into our practice which necessitates repeated evaluation. To compare the newly implemented TURP saline with conventional TURP water as control group in term of management and outcome in patients with prostatic enlargement. Patient and methods: Hospital- based prospective cross-sectional study. The included 50 patients with prostatic enlargement treated with TURP normal saline and other control group which included 50 patients treated with TURP water. The mean of prostatic size in patients used normal saline (mean 77.28 ± 24.24) as irrigation fluid was greater than the mean of patients used water (mean 62.00 ± 35.22). Also in the operative time the difference was significant with P-value (0.000), the normal saline group (mean 38.45 ± 7.85) and water group (mean 29.69 ± 12.76). The normal saline (mean 1 ± 0.00) group stayed in the hospital less time than the water group (mean 3.34 ± 1.32) with P-value (0.000). Intra-operative complications as severe hypotension didn't occur neither in patients used normal saline nor in those who used water as irrigation fluids, urinary bladder perforation occurred in (2%) of the water group. Postoperatively, catheter block and infections occurred in (8%) and (2%) respectively in water group, but it did not occur in those who used normal saline. Blood transfusion was required in (14%) of patients who used water as irrigate. Bipolar transurethral resection of prostate (TURP saline) is clinically comparable to monopolar transurethral resection of prostate (TURP water) with an improved safety profile.

Keywords: Bipolar, TURP saline, Monopolar, TURP water

INTRODUCTION

Transurethral prostate resection is still the most popular operation for symptomatic prostatic enlargement. The morbidity rate associated with transurethral resection of prostate (TURP) is 7% to 43% in the Agency for Health Care Policy and Research report [1]. The ideal irrigate for endoscopic resections would be a user friendly, nonconductor medium that does not interfere with diathermia, has a high degree of translucency and osmolality similar to that of serum, non-haemolytic, nontoxic, transparent, easy to sterilize, inexpensive and causes only minimal side effects when absorbed [1,2]. Unfortunately such a solution does not exist, and each irrigating fluid comes with its own potential complications. Several irrigation fluids have been used and abandoned over the years [2]. Originally sterile water was used as irrigation fluid but water absorption causes haemolysis, resulting in postoperative and occasionally lethal haemoglobinuria [1]. Glycine, and Cytal were commonly used, nowadays physiologic saline is used by a large number of urologic surgeons worldwide [2]. Whenever irrigation fluid enters the intravascular space, dangerous complications can arise

[3]. Since its introduction, bipolar transurethral resection of prostate (TURP) has gained much popularity among urologists worldwide [4]. The bipolar technology allows for resection of the prostate gland in saline solution. A proposed advantage of bipolar resection is improved haemostasis, resulting in better intraoperative visualization. With the use of saline as the irrigant, bipolar TURP also reduces the risk of TURP syndrome. Some studies also reported a shorter catheterization time, with reduced hospital stay for bipolar TURP compared to monopolar resection [4]. The TURP saline technique was newly introduced into our practice which necessitates repeated evaluation.

PATIENT AND METHODS

Hospital- based prospective cross-sectional study. The study was conducted at two hospitals (Omdurman Military Hospital for TURP saline), (Ibnsina Teaching hospital for TURP water), Khartoum, Sudan. Total coverage method was used to determine sample size for the study duration of one year (July 2014-July 2015). The total cases number was 100 patients. The included 50 patients with prostatic

enlargement treated with TURP normal saline and other control group which included 50 patients treated with TURP water. The “Mann-Whitney for two independent samples” and “Wilcoxon test for two related samples” were used to compare between chemical and haematological values in the two groups. The “Chi-Square test” was used to evaluate the association

between categorical groups and irrigation fluid. The significance level adopted was 5% at 95% CI and Statistical data were analyzed using commercially available software (SPSS).

RESULT

Table-1: Showed there were no significant differences between the mean age of NS. Group (mean 69.57±8.89) and the W. group (mean 68.34±9.57) and P-value = 0.190

Age	NS .group	Mean±SD	W. group	Mean±SD
50-59	07 (14%)	69.57±8.8	05 (10%)	68.34±9.5
60-69	12 (24%)		23 (46%)	
70-79	23 (46%)		15 (30%)	
80+	08 (16%)		07 (14%)	
Total	50(100 %)		50 (100 %)	

Table-2: Showed the mean of prostatic size in patients used normal saline (mean 77.28±24.24) as irrigation fluid was greater than the mean of patients used water (mean 62.00±35.22) and P-value =0.001

Prostate size	NS. group	Mean±SD	W. group	Mean±SD
<61	17 (34%)	77.28±24.2	28 (56%)	62.00±35.2
61-80	12 (24%)		10 (20%)	
81-100	11 (22%)		07 (14%)	
≥100	10 (20%)		05 (10%)	

Table-3: Showed there were differences between NS. group and W. group in Chemical and haematological values preoperatively for both irrigation fluids in Haemoglobin P-value (0.033) Haematocrit P-value (0.000), Sodium Potassium P-value (0.000) and s.creatinine P-value (0.026) respectively.

Pre-operative values	NS. group	W. group	P value
Haemoglobin(g/dl)	12.88±1.51	13.53±1.70	0.033**
Haematocrit (%)	36.3±4.96	41.97±5.45	0.000**
Sodium(mmol/l)	129.3±24.19	139.14±4.21	0.000**
Potassium(mmol/l)	3.59±0.44	8.25±20.05	0.000**
Blood urea (mg/dl)	33.71±17.22	39.17±21.85	0.072*
S. creatinine (mg/dl)	1.31±0.53	1.53±0.83	0.026**

** Significant * Not significant

Table-4: Showed the operative technique and time of NS. group and W. group and also showed that 87.5% of patients used water as irrigation fluid did not have complete resection of the prostate because of (25% had bleeding and 62.5% had a large size prostate) . Also in the operative time, there was a significant difference between the NS. group and W. group P-value (0.000)

Clinical characteristics	NS. group	W. group	P value
TURP session			
First session	50(100.0%)	43(87.8%)	0.774*
Second session	0 (0.00%)	7(12.8%)	
Operative technique			
Number of bottles (Means ± SD)	9.49±2.40	10±0.00	0.668*
Resection			
Completed as planned	50(100%)	43(86%)	0.039**
Not completed	(0.0%)	7(14%)	
Operative time (Means ± SD)	38.45±7.85	29.69±12.76	0.000**

** Significant * Not significant

Table-5: Showed there were differences between NS. group and W. group in Chemical and haematological values in the second postoperative day for both irrigation fluids in Sodium P-value (0.001) Potassium P-value (0.006) and s.urea P-value (0.003) and s.creatinine with P-value (0.012) .

Post-operative values	NS. group	W. group	P-value
Haemoglobin (g/dl)	11.62±1.65	11.98±2.33	0.345*
Haematocrit (%)	35.05±5.46	37.31±7.04	0.111*
Sodium (mmol/l)	133.03±4.49	136.18±5.02	0.001**
Potassium (mmol/l)	3.47±0.43	3.77±0.43	0.006**
Blood urea (mg/dl)	30.28±14.38	42.62±26.37	0.003**
s.creatinine (mg/dl)	1.30±0.60(39)	1.63±1.19(50)	0.012**

** Significant * Not significant

Table 6 Showed the intra-operative complications like urinary bladder perforation occurred in (2%) of the study groups who used water as irrigation fluid. postoperatively, catheter block, infections occurred in about (8%) and (2%) respectively in

patients who used water as irrigation fluid, but it did not occur in those who used normal saline. Blood transfusion was required in (14%) of patients who used water as irrigant with P-value (0.007).

Table-6: Showed the intra-operative complications

Complications	NS. group	W. group	P-value
Intra-operative complications			
• Severe Hypotension	(0.0%)	(0.0%)	-
• Urinary bladder perforation	(0.0%)	01(02%)	0.315*
Postoperative complications			
• Catheter block	(0.0%)	04(08%)	0.053*
• Infections	(0.0%)	01(02%)	0.341*
• Blood transfusion	(0.0%)	07(014%)	0.007**
• Number of Blood pints (Means ± SD)	0±0.00	3.71±3.45	

** Significant * Not significant

Table-7: Showed the patients used normal saline as irrigation fluid stayed in the hospital less time (mean 1±0.00) than those who used water (mean 3.34±1.32) with P-value (0.000).

Hospital Stay (day)	NS. group	W. group
≤ 1	50 (100%)	0(0.0%)
2-3	0(0.0%)	11 (22%)
> 3	0 (0.0%)	39 (78%)
Means ± SD	1±0.00	3.34±1.32

DISCUSSION

Age

The mean age of the two groups of patients (n=100) was 68.93± 9.23 years. The mean age in w. group (monopolar) and NS. Group (bipolar) showed slight variation; it was 68.34±9.5 and 69.57±8.8 respectively. Our mean was higher than (65.96±6.6 in monopolar group versus 63.86±6.1 in bipolar group and P value < 0.05) in the study of Singhania P [5].

Investigations (US findings)

Average prostatic size (g) was found to be significantly different among the two groups. The bipolar NS. group showed a greater prostatic size (mean 77.28) than the patients of mono polar W. group (mean 62.00), p -value 0.001. A small number of studies have demonstrated its feasibility for this application; Botto et al reported similar findings showing that, nine patients had glands > 60g [6].

Preoperative and post-operative chemical and haematological values

A comparison between the chemical and haematological values in the preoperative and postoperative period of the study groups, revealed that the decrease in haemoglobin level (averages) was found to be significant among both groups, the decrease in haematocrit%, pre and post operatively was also found to be significant among both groups, but the drop was more obvious in W. group (monopolar) in both hemoglobin and hematocrit (%). The study of Ahyai, *et al.* reported a similar result showing that, the decrease in hemoglobin was significantly higher in the m-TURP group than in the pk-TURP group [7]. These findings are also in agreement with the two recent RCTs of Chen, *et al.* [8] and Fagerström, *et al.* [9] The decrease in average of sodium level, pre and post operatively in W. group (monopolar) was found to be highly significant, where it was normal among NS. Group (Bipolar). Literature also have reviewed that, the use of normal saline as irrigating fluid eliminates the risk of dilutional hyponatraemia and TUR syndrome, a potentially fatal complication occurring in up to 1.4% of cases with mTURP in a modern series [10].

Operative technique and time

Resection was completed 100% as planned (single session) among NS. group, compared with 86% among W. group. The difference between the two percentage was significant (p -value=0.039). In the operative time, there was a significant difference between the NS group (mean 38.45) and W. group (mean 29.69) with P -value (0.000). So NS group showed a longer operative time than W. group. This was revealed also by Issa *et al.* [11] retrospectively who reviewed the data from a subset of bipolar TURP saline with large resection weights (preoperative prostate volume was not determined). The average resection weight in their series of five patients was 49.6 g over an operative time of 2 hrs and 22 min, with no reported complications. So, bi polar TURP saline is a safer procedure in those with large size prostate.

Complications

Fourteen percent of patients in W. group were found to have blood transfusion and the mean of blood pints needed was (3.71 ± 3.45) , whereas none of the patients in NS group needed any. The degree of bleeding is less with bipolar TURP, because plasma can create the cut and seal effect⁽¹²⁾. In a previous study, intraoperative monopolar coagulation zones were reported to be lower than bipolar ones, signifying that the haemostatic efficacy of bipolar TURP might be better [13]. Previous RCTs comparing bipolar resection with m-TURP demonstrated that blood loss was significantly less in the bipolar group [14,15]. The authors concluded that bipolar TURP reduced overall peri-operative and total surgical bleeding by 34% [9].

Hospital stay

The hospital stay (days) was found to be 1 day among patients of NS. group, compared with 3.34 day among patients of W. group. Previous study also reported a shorter hospital stay for bipolar TURP compared to monopolar resection [4].

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