

Challenging the Safety Profile of Bipolar TURP Regarding Dilutional Hyponatremia

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Abstract

Objective: To measure the extent of Dilutional Hyponatremia after Transurethral resection of prostate using Bipolar Resection Technique.

Material and Methods: The study was conducted at Social Security Teaching Hospital Lahore. The study was carried out between 1st June 2022 to 30th November 2022. All patients who were candidates of surgical option and were planned TURP were included. They had pre-operative sodium levels done and this was compared to post operative levels on first post operative day. All patients included in the study had moderate prostate size and had resection time less than one hour.

Results: Total 45 patients having undergone bipolar TURP were included in the study. Among these 45 patients, 19 patients had a decrease in sodium levels postoperatively, further in these 19 patients, 14 patients had a decrease of less than 5 mEq/L. In 2 out of total 45 patients the sodium levels remained same post operatively. In 24 patients out of total 45 there was an increase in sodium levels, further in these 24 patients, 19 patients had an increase of less than 5mEq/L. In all 45 patients no clinical symptoms of dilutional hyponatremia were observed.

Conclusion: There was no significant dilutional hyponatremia seen after bipolar TURP and wherever observed did not caused any clinical impact, proclaiming Bipolar TURP as a safe option for prevention of dilutional Hyponatremia during surgery for Benign prostate enlargement (BPE).

Key words: Surgery, Sodium, Glycine

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Introduction

Benign prostate enlargement (BPE) is one of the most common disease affecting men over the age of 60 years. Incidence of BPE is 70% in men over the age of 60 and 80% over the age of 70 years. Different management

options are recommended for benign prostate enlargement such as conservative management, medical therapy, transurethral resection and open prostatectomy. Transurethral resection of prostate can either be done by monopolar resection in which 5% dextrose water or 1.5 % glycine is used as irrigant or bipolar resection where normal saline is used as irrigant. Transurethral resection of prostate using monopolar resection technique leads to absorption of fluid leading to dilutional hyponatremia.¹⁻³ The resultant lower levels of sodium can lead to fatigue, vomiting, confusion, visual loss, coma and death. In Bipolar TURP, normal saline is used as irrigation fluid which is supposed to be helpful in countering dilutional hyponatremia as compared to Monopolar TURP resection.³⁻⁷

Regarding safety of Bipolar resection of TURP in preventing dilutional hyponatremia, many studies have been conducted worldwide advocating its superiority

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over monopolar resection.⁸ It is generally accepted by urologists all over the world, that bipolar TURP has better safety profile than conventional monopolar TURP.^{9,10} The data and studies however challenging the safety profile of bipolar TURP regarding hyponatremia, are very limited in Pakistan. There is a need to study the safety of bipolar TURP regarding prevention of hyponatremia as per claims by manufacturers and popular clinical belief. There is a need to critically analyze the safety of bipolar resection of prostate regarding dilutional hyponatremia. The purpose of this study is to measure and analyze the extent of dilutional hyponatremia after Bipolar TURP in Pakistani population thus establishing its safety regarding prevention of hyponatremia and resultant sinister consequences.

Material and Method

The study was conducted at Social Security Teaching Hospital Lahore. It was an observational study using convenient sampling technique. After approval from ethical review committee of hospital, all patients who were recommended surgical intervention were included in the study. The study was carried out between 1st June 2022 to 30th November 2022. The patients were aged between 50 and 90 years, with prostate size on ultrasound between 40 to 80 grams and resection time less than an hour. Patient with monopolar resections were excluded from the study as were patients with recurrent disease. Patients with co-existent pathologies like bladder stones, bladder growths and patients with suspicion of carcinoma of prostate were also excluded from the study. They had pre operative measurement of sodium levels as well as sodium levels were measured after the resection on 1st post operative day.

Results

Total 45 patients were included in the study having undergone bipolar TURP. The mean age of patients was 68.5±7.75. The mean post operative sodium levels observed were 137.5±4.137. Among these 45 patients, 19 patients had a decrease in sodium levels postoperatively, with a mean decrease of 3.89±3.541. Among these 19 patients with decreased sodium levels, 14 patients had a decrease of less than 5 mEq/L and remaining 4 had a decrease of more than 5 mEq/L. In 2 out of total 45 patients the sodium levels remained same post operatively. In 24 patients out of total 45 there was an increase in sodium levels post

operatively with a mean increase of 4.16±4.379. In these 24 patients who had an increased post operative sodium, 19 patients had an increase of less than 5 mEq/L and 6 patients had an increase of more than 5 mEq/L. In all 45 patients no clinical symptoms of dilutional hyponatremia were observed post operatively.

Figure 1: Pie Chart representation of Changes in Serum sodium levels after Bipolar TURP

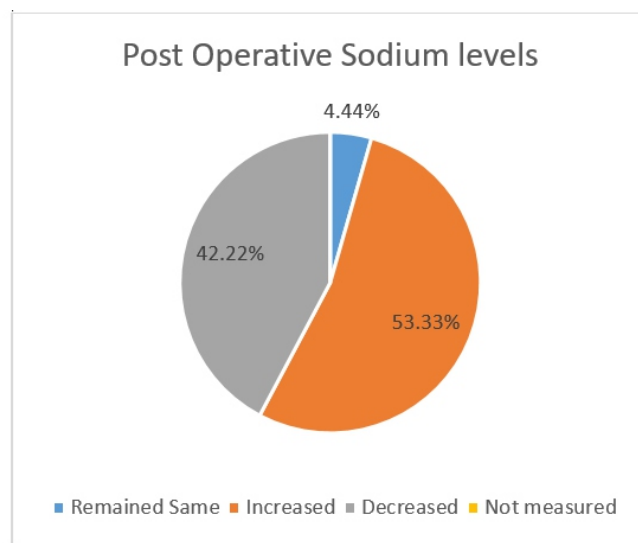


Table 1: Stratification of Patients according to post operative serum sodium levels after bipolar TURP

Range of Post Operative Sodium	Number of Patients
125-130 mEq/L	03
131-135 mEq/L	15
136-140 mEq/L	20
141-145 mEq/L	06
146-150 mEq/L	01

Discussion

TURP syndrome is a nightmare for urologist while performing monopolar TURP. The stress being on prevention of dilutional hyponatremia rather than treatment. Bipolar resection using normal saline as irrigation should theoretically be a good alternative option for the same purpose as compared to monopolar resection technique.

Worldwide similar studies have been conducted analyzing the safety of Bipolar TURP regarding dilutional hyponatremia.¹¹⁻¹² In a study conducted in Atlanta veterans affairs hospital, USA similar small mean decrease in post operative sodium of 1.6 mEq/L was seen, as was seen in a study conducted in Singapore general

hospital Singapore where mean decrease was 3.2 mEq/L . This is very similar to our study where mean decrease in post operative sodium is 3.8 mEq/L. In many other studies conducted globally in Germany, USA , Belgium, Italy and Netherlands comparing bipolar resection with monopolar resection, the former was found superior in safety regarding prevention of hyponatremia.

In few other studies there was no difference seen in comparing monopolar and bipolar resections regarding occurrence of hyponatremia in moderate degree of prostate enlargement .¹³ however difference was more marked dealing with larger prostates(>100grams) i.e. mean decrease of 10.7mEq/L with monopolar as compared to 3.2mEq/L with bipolar resection. The cost effectiveness profile of bipolar TURP was also found promising in a study conducted in Aberdeen, UK when post operative complications including hyponatremia and post operative stay were also taken into account.^{14,15}

In an era of prevention rather than treatment of complications, our study has shown that bipolar TURP is the safer option regarding hyponatremia prevention in a moderate sized prostate with optimal resection time . The limitations of our study however is small sample size, lack of inclusion of very large sized prostate with resection times exceeding the generally accepted safer limits. We plan to address these shortcomings in future studies in our center.

Conclusion

It is concluded that there was no significant dilutional hyponatremia seen after bipolar TURP and wherever observed did not caused any clinical impact, proclaiming Bipolar TURP as a safe option in regards to prevention of dilutional Hyponatremia in patient requiring surgery for Benign prostate enlargement (BPE).

Conflict of interest:

None

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None

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Author's Contribution

NAG: Concept, Data Collection, Writing and Design

SH: Data Collection, Critical review

SN: Data Collection

MRS: Critical review

RMU: Critical review

ARK: Critical Review