

THE EFFECT OF 5% DA ON BLOOD GLUCOSE LEVEL USING AS IRRIGANT DURING THE PROCEDURE OF TURP

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Summary

During TURP 1.5% Glycine is a conventional fluid being used as irrigant worldwide. Now a days we are also using 5% Dextrose in Aqua as an irrigant. The aim of this study is to observe the changes in blood glucose level by using 5% dextrose in aqua as an irrigation fluid in TURP for BPH.

This was a observational study, conducted on 50 non diabetic BPH patients admitted in the department of Urology, CMCH between 01January, 2006 to 31December, 2007. TURP was done on these patients using 5% Dextrose in Aqua as irrigant. Blood glucose level was recorded pre operatively (24 hr. before opn.), immediate post operatively (5 minutes after surgery) and 24 hour after surgery. Post operative results compared with preoperative values. 2 cases were excluded from current study and rest 48 patients were included into the study. Mean pre operative blood glucose level was 5.97 (± 0.60) mmol/L, then it was increased to 6.64 (± 0.50) mmol/L, which was significant ($P < 0.01$) in immediate post operative period. The value then reduced to 6.28 (± 0.49) mmol/L ($P < 0.05$) 24 hour after surgery. which were within the normal serum glucose level. All the values returned towards pre operative level and the changes were not significant. So, we can do the TURP in remote part of Bangladesh by using 5% DA as an irrigant without fear of blood glucose change.

Key words

Blood glucose; BPH; TURP; 5% dextrose in aqua, irrigant.

Introduction

BPH is a part of normal aging process. Prevalence of prostatic enlargement progressively increases with age. Merely increase in size does not produce any symptom, unless it causes obstruction to outflow of urine or associated with any complications like refractory urinary retention, recurrent UTI, bladder stone formation, recurrent Hematuria, upper tract

obstruction etc..When prostatic enlargement accompanied with Lower Urinary Tract Symptoms (LUTS) treatment is indicated. There are different types of treatment options including nonsurgical and surgical modalities. Surgery is indicated when BPH produces significant obstruction (PVR>100ml, Q_{max} is <10ml/sec. IPSS score is >20) or BPH with associated complication. Transurethral resection of prostate (TURP) is still the gold standard management in endoscopic prostatic surgery [1,2,3,4].

For the endoscopic procedure, a fluid is required to irrigate the operative field continuously for visualization. Choice of irrigating solution is important in transurethral resections (TURs) as absorption of irrigant from prostatic bed through the venous sinuses causing hemodynamic derangements, like TUR syndrome [5].

Although uncommon, the incidence of TUR syndrome is still approximately 2% in modern science [6].

Several fluids are used for irrigating the operating field. They are Glycine in different concentrations like 1%, 1.1%, 1.5% and 2.1%, mannitol 3%, 2.7% Sorbitol 0.5% Mannitol, 5% Glucose (5% Dextrose in Aqua) etc. Among them 1.5% Glycine solution is most commonly using irrigant worldwide [3].

In Bangladesh 1.5% Glycine solution was most commonly used solution. But now a days 5% DA is getting popularity amongst the young urologists throughout the country.

5% Dextrose Solution in water is cheap, easily available and producing by all intra venous fluid producing companies of Bangladesh. The use of this solution in diabetics needs pre, intra and post operative blood sugar monitoring [7].

A solution of 5% glucose is a standard crystalloid, and glucose is metabolized throughout the body. It is a ready form and instead of converting to an intermediate form like glycine, is directly converted to energy. Use of 13 liters of 5% glucose in Aqua is required to absorb from prostatic bed to expand the intravascular compartment by 1 liter.

A study conducted between December 2001 and March 2003 at Bristol Urological Institute on 300 patients undergoing TURP. Of them 124 patients irrigated with 5% glucose, 13 were diabetic; were managed peri operatively with a standard protocol for diabetic patients, receiving intra venous Insulin

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infusion. Immediately after TURP in these 13 patients the median glucose level was 8.1 mmol / liters, but by the second blood sample at 5 hours after TURP all patients were within the normal range [7].

For over 20 years, urologists in one District General Hospital used only 5% glucose as their irrigant of choice, and their clinical experience lead them to think that 5% glucose solution is non toxic and is entirely satisfactory as an irrigating fluid for use during endoscopic surgery [8]. These urologists have apparently not been aware of problems with stickiness of the instruments or caramelization of the cutting loop diathermy during surgery, and consider 5% glucose to appear optically identical to 1.5% glycine.

A study of hemodynamic and biochemical changes in 30 patients having a Transurethral Resection of Prostate for Benign Prostatic Hyperplasia was carried out by using 5% Dextrose Aqua as an irrigant at Department of Anesthesia, Analgesia and Intensive Care Unit, BSMMU on 1998. A comparison of the immediate post surgical with the pre anesthetic values revealed an increase in mean blood glucose level was increased from 5.82 to 8.17 mmol / liter ($p < 0.01$). But when the values 24 hour after surgery compared with immediate post surgical period, blood glucose concentrations were decreased to 6.48 ($p < 0.05$). All values returned towards pre anesthetic value [9].

A good number of studies had been conducted in many centers worldwide. But in Bangladesh only above study was documented so far.

The main objective of this study is to observe the changes in blood glucose level in pre, immediate post and 24 hour after operation by using 5% Dextrose in Aqua as an irrigant in TURP.

Inclusion criteria

Patients having indication for TURP, physically fit without any co morbidity and having 50-60 grams of prostate on Ultrasonography.

Exclusion criteria

Patients having Diabetes Mellitus. Visible large capsular perforation during TURP. Excessive venous bleeding due to opening of venous sinuses. More than 1 hour resection time.

Materials and methods

After getting clearance from ethical committee of Chittagong Medical College and fulfilling the inclusion criteria an observational study, conducted on 50 non diabetic BPH patients admitted in the department of Urology, Chittagong Medical College

Hospital, Bangladesh for TURP between 01January2006 to 31December,2007. They were irrigated with 5% Dextrose in Aqua. Intravenous infusion was maintained by 0.9% NaCl during the whole procedure. Patients were operated under SAB and their operative details were recorded. The irrigation fluid was delivered via a fast flow set from a reservoir, set at 60 cm above the symphysis pubis. The duration of TURP, weight of resected tissue, volume of the irrigant used and evidence of prostatic capsule perforation was recorded. Blood transfusion, if needed was recorded. Standard protocol was for two 8 hrly bags of 0.9% Normal saline to be prescribed as post-operative infusion. Blood glucose level was recorded, pre operatively (24 hr. before opn.), immediate post operatively (5 minutes after surgery) and 24 hour after surgery. The results of immediate post operative period and 24 hours after surgery were compared with preoperative values.

Patients with more than 1 hour resection time, large capsular perforation, prolonged bleeding time due to opening of venous sinuses were excluded from the study finally.

Observations and results

Of the 50 patients included in the study, no one died, no drop out was observed. 1 patient had more than 1 hour resection time & 1 patient had prolonged bleeding due to opening of venous sinuses. So, those 2 cases were excluded from current study and rest 48 patients were included into the study.

Table I: Distribution of age of the patients.

VARIABLES	N	MEAN	SE MEAN	SD	RANGE
Age of the Patients (in Years)	48	64.17	1.08	7.47	50–72

N= Frequency, SE= Standard Error, SD= Standard Deviation

Table II : Distribution of resection time.

VARIABLES	N	MEAN	±SD
Total resection time (In min.)	48	53.39	7.88

Table III : Distribution of amount of irrigant used.

VARIABLES	N	MEAN	SE MEAN	SD
Amount of irrigant used (In liters)	48	15.49	1.08	2.16

Table IV : Blood Glucose levels with independent sample T – Test.

	N	MEAN	SE MEAN	± SD
Pre-operative Serum Glucose (mmol/L)	48	5.97	0.09	0.60
Post-operative (within 5 minutes) Serum Glucose	48	6.64	0.07	0.50
Post-operative (> 24 hours) Serum Glucose	48	6.28	0.07	0.49

Discussion

In our study patients were selected for TURP ranging from 50 to 80 years of age admitted to Urology department of CMCH who fulfilled the inclusion criteria. The mean age was 63.54(±7.91) years. Mean age of the study conducted in UK was 74.3(±8.9) years and it was 65.66(±6.52) years in the study of BSMMU [5]. The mean age of our current study was near to the mean of BSMMU study, much less than the study done in UK. It might be due to the fact that the average life span in Bangladesh is less than 60 years (Bangladesh statistical bureau).

The mean resection time was 53.39(±7.88) min in our study and the mean in BSMMU study was 51.5(±12.80) min. The mean resection time is almost same in two studies.

Mean pre operative blood glucose level was 5.97 (±0.60) mmol/L which was increased to 6.64 (±0.50) mmol/L (P<0.01) in immediate post operative period. The value again reduced to 6.28 (±0.49) mmol/L (P<0.05) 24 hour after surgery, which were within the normal serum glucose level.

So, blood glucose level initially increased in immediate post operative period and then came down 24 hours after surgery, remain higher than the pre operative values.

Moinul et al, in 1998 at BSMMU showed the pre operative value of serum glucose was 5.82(±0.68) mmol/L, in immediate post operative period it was 8.10 (±2.67) mmol/L and 24 hour post operatively it was 6.44 (±0.91) mmol/L in 5% dextrose in aqua study. This result matched with our current study.

Justin W. Collins et al, 2005 at Bristol Urological Institute showed that immediate after TURP serum glucose level was 6.1 (5.2-9.9) mmol/L and 5 hr after TURP it was 6.5 (5.7-7.9) mmol/L. The result was also similar to our study.

Conclusion

We may conclude that 5% glucose in aqua does not produce any significant change in blood glucose level when used as an irrigant in TURP in BPH. So, 5% DA may be used as irrigant during TURP at district level hospital without hesitation.

Disclosure

All the authors declared no competing interest.

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