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Blood Transfusion in Transurethral Resection of the Prostate (TURP): A Practice that Can be Avoided.

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Background: This study was aimed at establishing the determinants of blood transfusion in Transurethral Resection of the Prostate (TURP) at the Kilimanjaro Christian Medical Centre (KCMC) and explore prudent methods of blood use in this urological surgery
Methods: This was a one year prospective, hospital based study done at The Kilimanjaro Christian Medical Centre, a 550 bed tertiary centre in the Kilimanjaro region of Tanzania. The study population consisted of 128 of 220 patients who underwent TURP in the year of study. The primary outcome measure was the factors that determine blood transfusion in TURP surgery in KCMC. The secondary outcome measure was the underlying causes leading to blood use and the likely modes that can lead to better use of blood in this urological surgery.
Results: One hundred and twenty eight out of 220 patients were transfused, giving a blood transfusion rate of 58.2%. The mean amount of whole blood transfusion was 1.2 units with a range of 1-4 units. The main determinants of blood transfusion were prostate resection greater than 40grams, preoperative Hb less than 11g/dl and the experience of the surgeon. Underlying causes included lack of hospital transfusion protocol and routine autologous donation with a laboratory policy that fails to use the auto-donated blood for other patients who may need it.
Conclusion: Inappropriate clinical decisions and lack of hospital blood transfusion protocol are responsible for improper use of available blood. Slightly more than three quarters of the transfusions were unnecessary and indicate that with a proper hospital transfusion protocol, blood transfusion after TURP can be minimized or, with modern approaches like intra-prostatic epinephrine, be done away with altogether.
Recommendations: Clinical decisions based on prudent use of blood should be instituted to maximize on its benefits to deserving patients. A hospital policy with adequate laboratory support should be put in place to ensure adequate screening that allows availability of blood to patients in need irrespective of mode of donation.

Introduction

Transurethral resection of the prostate (TURP) is the gold standard surgical procedure in benign prostate hyperplasia (BPH) even with an increasing array of minimally invasive endoscopic procedures for it[1]. It is known to have lower blood loss than open prostatectomy[2-4] but like in any other surgical procedure, blood transfusion may become necessary. This paper looks into blood transfusion after TURP in a tertiary centre in Tanzania and considers the best way forward in view of modern trends in technology and blood use.

Patients and Methods

All patients with clinical and imaging evidence of obstructive benign prostatic hyperplasia planned for TURP had their demographic data taken after consenting to participate in the study. The pre-operative evaluations included full haemogram, creatinine level, American Society of Anaesthesiologists (ASA) score and verification as to presence of bleeding disorder or use of anticoagulants or anti-platelet medications. Vital signs were recorded and observations maintained during and after surgery. The amount of prostate tissue resected was weighed using a standard electronic weighing machine. Blood transfusion

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was administered under keen nursing supervision and the post operative haemoglobin level was checked after 48 hours. All patients had spinal anaesthesia for the surgery.

Results

Two hundred and twenty patients with a mean age ± standard deviation of 65.4± 10.2 years underwent TURP. All had normal vital signs and biochemical lab results. Out of these, 128 had blood transfusion, giving a transfusion rate of 58.2%. There were a total of 152 units of blood transfused ranging from 1 to 4 units and an average of 1.2 units as seen in table 1. One hundred and twenty two patients received their autologus blood back while a total of 30 had allogenic blood transfusion. Of these, 24 had two or more whole blood units transfused.

No patient had a bleeding disorder nor was any on anti-clotting medication. Their ASA classification was as follows: 76 had ASA Grade I, 49 Grade II and 3 Grade III. There was no significant correlation between the ASA grade and amount of blood lost or the need for transfusion. Pre-operative haemoglobin level ranged from7.0-16.2 g/dl with a mean± standard deviation of 13.1 ± 1.6 g/dl. The preoperative haemoglobin level was a determinant of a likely postoperative blood transfusion with those with Hb less than 11g/dl being twice as likely to be transfused.

There was no objective way of assessing blood loss intra operatively. The post operative change in haemoglobin levels within 48 hours ranged from 0.4-4g/dl and a mean of 1.1g/dl. There was no correlation between age and change in levels of haemoglobin. Weight of prostate resected ranged from 1 to 117 gm and there was a positive correlation between weight of prostate resected and post operative change in haemoglobin levels as seen in figure 1.

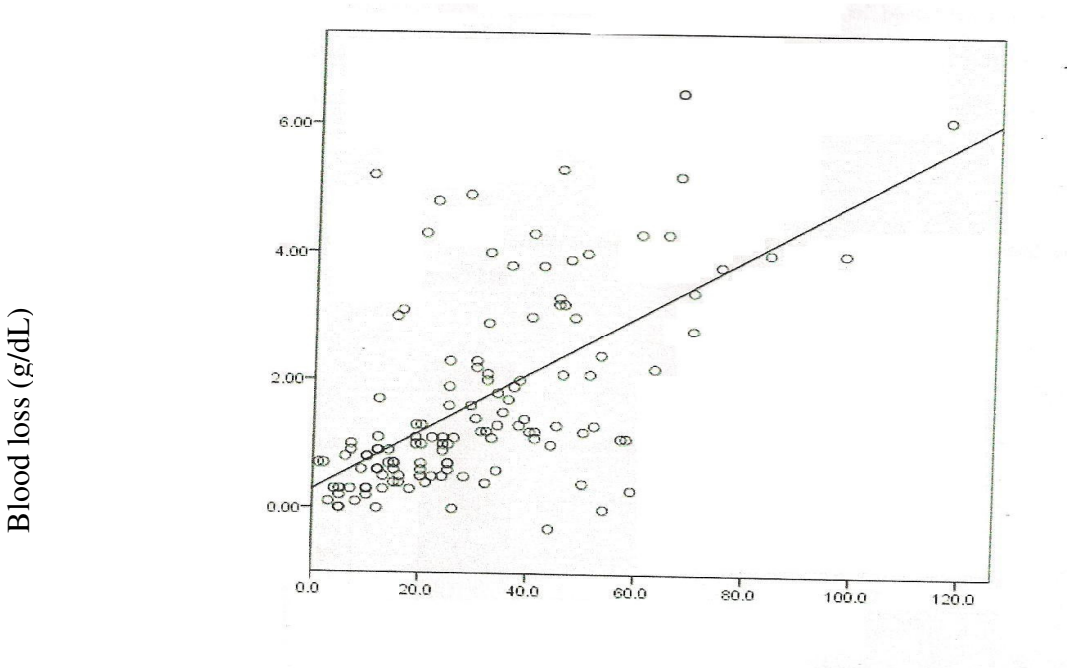

Figure 1. Relationship Between the Amount of Tissue Resected and Change in Haemoglobin Levels

The average amount of blood loss was 21.1 ml/gm of resected prostate tissue. Those resected more than 40g prostate had significantly higher blood loss than those below 40g ($p<0.001$) with patients who had 2 or more units of blood transfusion all having been resected 40 or more grams of prostate tissue. Duration

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of resection in excess of 45 minutes and competence of the surgeon were also found to be correlated with change in the blood volumes. Patients operated on by residents were thrice as likely to require transfusion as those operated on by qualified urologists ($p < 0.001$).

Table 1. Units of Blood Transfused in TURP Surgery

Amount of Blood in units	Autologous	Allogenic	Total
One	122	06	128
Two	00	14	14
Three	00	06	06
Four	00	04	04
Total	122	30	152

Discussion

Blood transfusion is a life saving procedure that requires elaborate evaluation and clinical acumen. For a commodity with no effective substitute, mechanisms should be put in place to ensure that it is used only when necessary.

TURP remains the gold standard of treating BPH and its main morbidity is bleeding that may lead to clot retention, bladder irrigation and possible need for blood transfusion[1-4]. In our study, a significant proportion of transfused patients (76.6%) did not need it given that they either received their autologous blood back or had one unit of allogenic blood given to them. This may suggest the absence of or a inadequate blood transfusion protocol in which almost everybody going for TURP is also prepared for a possible blood transfusion. The hospital had no transfusion protocol, the laboratory rejected auto-donations on the grounds that they required extra work to be available for use by other patients and decisions on transfusion in the urology unit were devoid of evidence based practice with regard to post-TURP transfusions. Kallenberg and colleagues proved in their study that sound clinical decisions and adequate experience can lead to no post operative blood transfusion after TURP[5].

Our postoperative mean haemoglobin loss of 1.1g/dl compares well with the 0.7g/dl found in a study by Descazeand and others in which they also objectively ascertained an average blood loss of 507ml in the 72 hours following TURP[6]. This amount that is equivalent to one unit of whole blood can easily be compensated for by the heamodynamic changes that follow surgery and would mean that most patients undergoing TURP need not be transfused. Lack of adequate fluids management principles and nonexistent blood transfusion protocol in the hospital must have contributed to excessive and unnecessary blood transfusion. With advances such as intra-operative use of epinephrine and tranexamic acid that have been shown to reduce blood loss[7-9], blood transfusion in TURP can be avoided altogether.

Conclusion

Inappropriate clinical decisions and lack of hospital blood transfusion protocol are responsible for improper use of available blood. Slightly more than three quarters of the transfusions were unnecessary and indicate that with a proper hospital transfusion protocol, blood transfusion after TURP can be minimized or, with modern approaches like intra-prostatic epinephrine, be done away with altogether.

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Recommendations

Clinical decisions based on prudent use of blood should be instituted to maximize on its benefits to deserving patients. A hospital policy with adequate laboratory support should be put in place to ensure adequate screening that allows availability of blood to patients in need irrespective of mode of donation.

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