IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 5 Ver. XI (May. 2017), PP 84-88
www.iosrjournals.org

Blood Ordering Schedule for Urological Procedures at Tertiary Care Hospital

Dr. Sona Dave MD. DNB[1], Dr. Shreya Shah MD .DNB[2],
Dr .Deepa Suvarna DA DNB[3], Dr. Pinakin Gujjar DA, MD[4]
[1.] *Professor * Department Of Anaesthesiology*
[2] *Assistant Professor .Department of Anaesthesiology*
[3.] *Assistant Professor Department of Anaesthesiology*
[4.] *Professor and Head Department of Anaesthesiology*

Abstract:
Introduction*: Blood transfusion practices are changing with new fears of transmitting diseases. However blood ordering practices continue to follow the older policies with more blood being crossmatched than required. Maximum blood ordering schedule was a term coined for preparing a list of major surgeries and the number of units crossmatched for them. This study was undertaken to determine the blood ordering practice in the urological theatre in a tertiary hospital.*
Methods: *Three hundred cases undergoing major urological procedures where blood was routinely crossmatched were studied with respect to the number of units crossmatched , number of units ordered and the number of units transfused . The procedures were divided into 10 groups. After this three ratios which included crossmatch to transfusion (C/T) ratio , transfusion index and probability of transfusion were calculated.*
Results*: C/T ratio for PCNL was 104.66. Only for radical cystectomy C/T ratio was 1.3 and the probability of transfusion was 100%.. If the transfusion index of greater than 0.5 is considered significant then only radical cystectomy and radical nephrectomy with indices of 2.5 and 0.8 respectively justify crossmatching for the said surgeries.*
Conclusion*: Crossmatch for major urological procedures especially endoscopic procedures is not justified unless there are preexisting comorbid conditions. A grouping and screening policy can be employed for these procedures and the sere can be saved for further crossmatch in case blood is required.*
Key Words*: Maximum blood ordering schedule (MBOS) , Urology , Audit .*

I. Introduction

Blood loss is an integral part of any surgical procedures, hence replacing blood loss is a part and parcel of anaesthesia management. Blood loss for every patient varies depending on the type of surgery, coagulation status and surgical expertise, therefore predicting blood requirement accurately is difficult in most scenarios. Sudden blood loss may lead to hypotension and valuable time may be lost in cross matching blood, hence it is prudent to reserve blood for cases where blood loss is expected. There is an increasing need for blood as more demanding surgical procedures are being increasingly performed. However it is observed that in majority of surgeries the blood reserved far exceeds the requirement. When the blood is held reserve it becomes unavailable for other needy patients. This results in loss of shelf life and wastage of blood. Over the last few years there is change in blood transfusion practises. Due to fear of transfusion related infection and development of post operative lung dysfunctions there is reluctance in transfusing the patients. This also results in wastage of blood.
The word maximum surgical blood order schedule (MSBOS) was coined for a table which lists the major surgical procedures and the number of units of blood routinely cross matched for them.[1,2] Advantages of MSBOS include: More efficient use of blood and avoiding wastage , decreasing the workload of blood bank personal and avoiding loss of shelf life of blood.[1,2]There have been various studies in the past regarding blood ordering practises for major surgeries. However majority are pertaining to cardiac, general surgical and trauma cases where major blood loss is expected. Since urological procedures are routine surgeries which are endoscopic in nature, blood loss is very difficult to estimate. Blood cross matched may be disproportionate to the requirement. Thus we decided to carry out this audit with the aim to determine the efficacy of blood ordering system at urological surgical theatre in our tertiary care hospital. The objectives were to estimate blood required during major urological procedures, to recognise cases where only grouping of blood will be required and to formulate a protocol for cross matching and reserving of blood for major urological procedures

II. Material and Methods

After obtaining institutional ethics committee permission, an observational retrospective study was carried out in the urological OT at a tertiary care hospital. Three hundred major urological cases in which blood was routinely crossmatched was audited over a period of 6 months (1st July 2015 to 31stDecember 2015). The data recorded were, procedure performed, blood loss, number of blood units cross matched and number of blood units transfused .The surgieries included in our audit were, percutaneous nephrolithotomy (PCNL), trans urethral resection of bladder tumor (TURBT),trans urethral resection of prostate (TURP),laparoscopic nephrectomy, radical nephrectomy ,nephroureterectomy, radical cystectomy, ureteric reimplantation , urethroplasty ,renal transplant.

After data collection the following indices were calculated for each procedure

1. Cross match to transfusion ratio (C/T) ratio: This was calculated as the number of units cross matched to the number of units transfused. If this ratio is greater than 1 it would indicate that the numbers of units crossmatched are far in excess of those transfused.
   A ratio of > 2 is considered indicative of significant blood wastage.
2. Probability of transfusion (%T):
   $$\frac{\text{No. of patients transfused} \times 100}{\text{No. of patients cross matched}}$$

If the value is above 30% it would indicate significant usage of blood.

3. Transfusion index: It is the average number of blood units transfused for a given procedure..
   $$\frac{\text{No. of units transfused}}{\text{No. of patients cross-matched}}$$

If the index is more than 0.5 it indicates that blood needs to be cross matched for a given procedure

Statistical analysis

This was a retrospective audit regarding the blood ordering policies in the urology operation theatre. This data was compiled from the medical record department of our hospital. Of the 422 records of patients which were operated during the stipulated 6 month period (1st July 2015 to 31st December 2015), only 300 records were found complete. Thus the sample size of 300 was taken for our study**.**

III. Results

Data from four hundred patient who underwent urological surgeries were collected with respect to the number of blood cross matched for the particular surgery, blood loss and the number of units transfused .From the data indices such as - cross match to transfusion ratio (C/T) ratio, probability of transfusion and transfusion index were calculated. It was observed that the majority of the surgical procedures which were endoscopic e.g PCNL, TURP and TURBT, the C/T ratio were far in excess of the MSBOS limit. Out of the total 314 units of blood cross matched for PCNL only 3 were transfused .The calculated C/T ratio was 104.66 which was far above the ratio which indicates significant wastage of blood. Also the transfusion indices of most of the procedures were below 0.5 which indicates blood need not be crossmatched for those procedures. Only for procedures like radical nephrectomy, nephroureterectomy and radical cystectomy the probability of transfusion is more than 30% which indicates significant usage of blood. (Fig.1,2,3 . Table 1)

IV. Discussion

Blood loss is almost inevitable during surgical procedures. Blood is a perishable and expensive drug with a lifespan of only 35 days[2] .With each passing day, blood loses some of its components. When blood is ordered for a patient it becomes unavailable for other patients as it is kept reserved for that particular patient. Thus it loses precious days of its shelf life if it is cross matched and not used. As new and advanced surgical procedures are being performed each day the demand for blood is increasing. However with the rising concerns regarding safety of transfusion, blood is utilised with caution and after all means to combat the blood loss are surpassed. Also with better instrumentation and minimum access surgeries, blood loss in majority of the surgeries has been reduced. Also not all the patients on a surgical list make way to the operation table on a particular day due to time constraints and over ambitious lists prepared by the surgical team. These cancellation of cases also may not be informed in time to the blood bank and again delete valuable days from the lifespan of blood The C/T ratio first suggested by Boral Henry has been used to evaluate transfusion practises. [3] A C/T ratio of less than 2.5 was associated with significant blood usage. In our study it was much more than 2.5 in most of the surgeries except radical cystectomies which indicated that much more blood is crossmatched than transfused. Boral and Henry also suggested the transfusion index which when less than 0.5 does not require preoperative crossmatch. In majority of our procedures the transfusion index was much less than 0.5, hence they

do not justify for a preoperative crossmatch. Mead et al suggested the probability of transfusion with a value of greater than 30% being significant[3, 4].

In our study majority of urological procedures were endoscopic where blood was routinely crossmatched however seldom used. There are certain procedures like renal transplant where also blood is routinely crossmatched but rarely used because of concerns regarding allergens to the donor kidney. However in these procedures it is mandatory to crossmatch blood as catastrophes may occur and may not be pardonable. Also though MSBOS looks only at the surgical perspective there are certain preoperative conditions as in urological patients where preoperative anaemia may prompt them to crossmatch more blood than necessary.[5]
After cross matching blood becomes unavailable for about 48 hours. It costs approximately rupees 72 per cross matching in a public hospital. There are situations in which there may be delay in cross matching of the blood and these include patients with rare blood group or there is discrepancy in the blood group due to multiple transfusions. In these patients also it may be prudent to cross match blood in advance. When a sample is sent for cross matching the serum is preserved for 7 days. Thus in case of emergency an urgent cross match can be performed.

In a certain study it was shown that when the blood was not transfused it was recrossmatched 3-10 times for different patients. It is estimated that a technician can cross match 3 units per hour. Thus there is an immense wastage of man power and resources[6,7].

Certain urological endoscopic procedures rarely require blood. In such case if there is a good coordination between the blood bank and the surgical team with an assurance that in case of emergency, blood will be provided in a stipulated short period , only then ABO grouping and screening should be done . If transfusion is required a rapid spin cross match with the same ABO Rh group can be performed and made available which requires only 5 to 10 minute. [6]

Thus in accordance with Olawumi Ho et al we can also recommend that in procedure where neither of the three indices are significant, blood grouping alone should suffice and serum be saved for emergency cross match. However if even two of the indices are significant a formal crossmatching is advised[3].

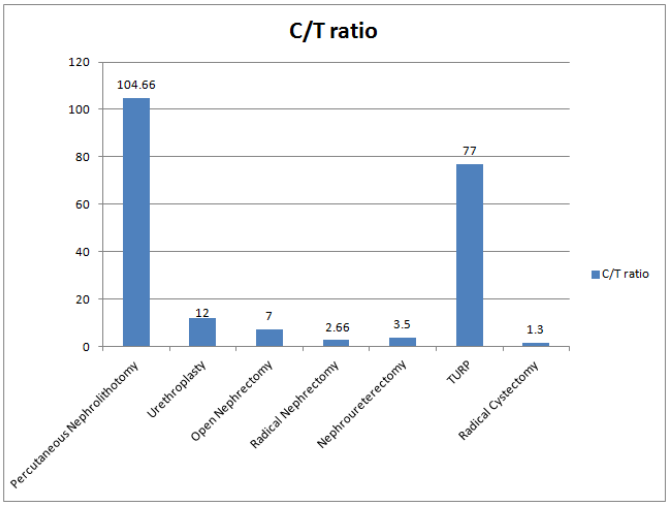
In endoscopic procedures a new format can be developed of performing only grouping and screening in all patients without comorbidities. In case screening reveals presence of antibodies then complete antiglobulin cross match should be done [6] .This can especially be done where the blood bank is in the same institution and blood has not to be transported over some distance. However in a certain subgroup of patients who are in chronic renal failure or in danger of urosepsis or in poor general condition blood should be crossmatched.

In conclusion,in pursuit of the dictum, ' better to be safe than sorry ', we are over burdening a system and loosing life of a valuable resource. We hope to modify the existing protocol of blood ordering system especially in cases of endoscopic urological surgeries based on our findings. Co ordination between surgeon, anaesthesiologist, blood bank and the supportive staff which are involved in procuring the blood from the blood to the operation theatre play a pivotal role if MSBOS has to be employed. [8]

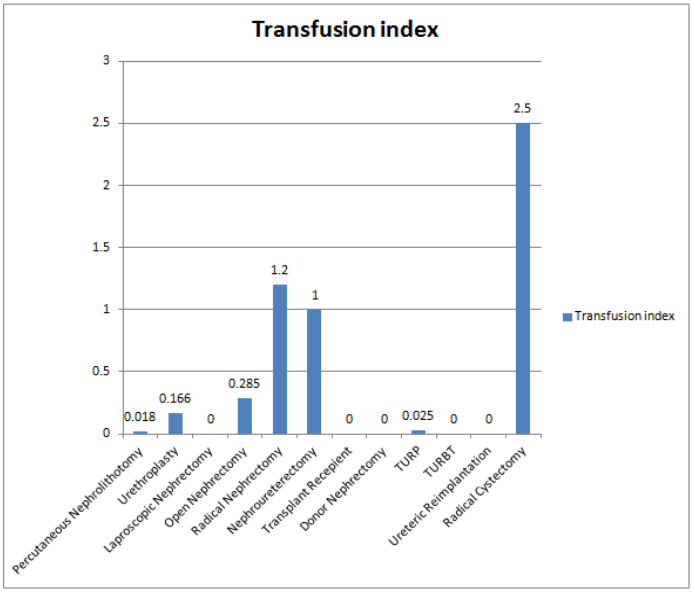
The limitation of our study was that it was carried out on only one subset of patients posted for urological surgeries. However it is to be noted that there was hardly any blood usage in this particular OT compared to the samples sent for cross matching, whereas in cardiac and orthopaedic surgeries the usage of blood is much more. Thus there is a need for MSBOS to be in place and the necessity to review it regularly and modify accordingly.

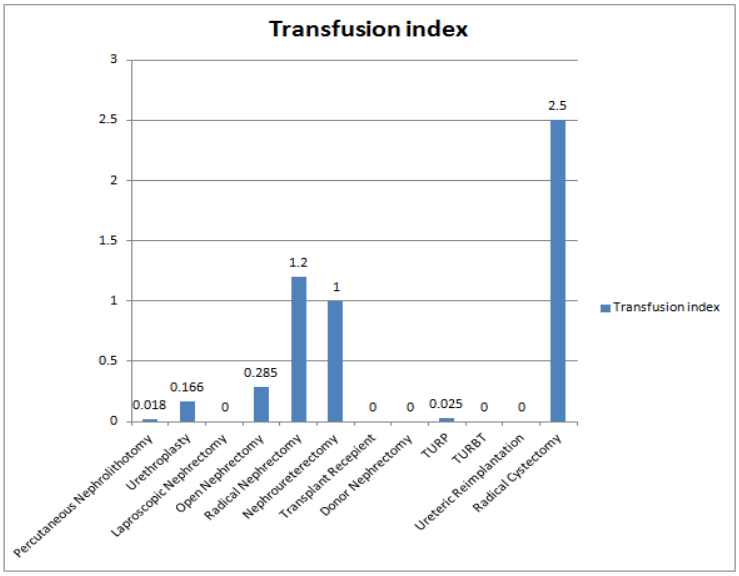
References

[1]. Napier JAF ,Boulton FE, Cann R, Finney RD , Fraser ID et al .Guidelines for implementation of a maximum surgical blood order schedule. Clin.lab.Haemat. 1990;12 :321-27.
[2]. Sheridan P. Revision and Implementation of a Maximum Surgical Blood Ordering Schedule in a Large Acute Hospital. [Masters dissertation]. Dublin: Royal College of Surgeons in Ireland; 2014.
[3]. Olawumi Ho, Bolaji Bo. Blood Utilization in Elective Surgical Procedures In Ilorin**:** The Tropical Journal Of Health Sciences 2006; 13:15-17.
[4]. .VibhuteM, KamathSK, ShettyA. Blood utilisation in elective general surgery cases: requirements, ordering and transfusion practices. J Postgrad Med 2000;46:13.
[5]. Thabah R , Sailo L.T, Bardoloi J, Lanleila M, Lyngdoh N. M, Yunus M., Bhattacharyya, P. 'Maximum Surgical Blood Order Schedule' in a newly set-up tertiary care hospital. Anaesth, Pain & Intensive Care.2013;17: 28-32.
[6]. ChawlaT, KakepotoG.N,KhanM.A.An Audit of Blood Cross-match ordering practices at The AgaKhan University Hospital: First Step towards a MaximumSurgical Blood ordering Schedule. J Pak Med Assoc. 2001; 51(7):251-4.
[7]. Muizuddin M, Jawaid M, Alam SN, Et Al. Utilization of Blood In Elective Cholecystectomy .Pakistan Journal Of Medical Sciences. 2007; 23(3): 331-33.
[8]. SubramanianA, SagarS, Kumar S, Agrawal D, AlbertV,Misra MH .Maximum surgical blood ordering schedule in a tertiary trauma centre in northern India: A proposal . Emerg Trauma Shock. 2012 ; 5(4): 321–27.



C/T ratios for laproscopic nephrectomy, donor nephrectomy, transplant recipient, TURBT and ureteric replantation were infinite, hence could not be graphically represented.





No.	Surgical procedure	No. of cases	Number of units cross matched	Number of units transfused	C/T ratio	Transfusion Index	Probability of Transfusion (%)
1	Percutaneous Nephrolithotomy	160	314	3	104.66	0.018	1.87
2	Urethroplasty	30	60	5	12	0.166	16
3.	Laparoscopic Nephrectomy	10	20	0	infinite	0	0
4.	Open Nephrectomy	7	14	2	7	0.285	28.5
5.	Radical Nephrectomy	5	16	4	2.66	1.2	60
6.	Nephroureterectomy	2	7	2	3.5	1	100
7.	Transplant recepient	5	10	0	infinite	0	0
8.	Donor Nephrectomy	5	20	0	infinite	0	0
9.	TURP	40	77	1	77	0.025	2.5
10	TURBT	25	50	0	infinite	0	0
11	Ureteric reimplantation	7	12	0	infinite	0	0
12	Radical cystectomy	4	13	10	1.3	2.5	100

A C/T ratio of > 2 is considered indicative of significant blood wastage.
If the value of probability of transfusion is above 30% it will indicate significant usage of blood.
A transfusion index of more than 0.5 indicates that blood needs to be crossmatched for a given procedure.