AUDIT OF BLOOD REQUISITION

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ABSTRACT

A total of 2793 requisition forms received by the blood banks of a Service zonal hospital, between June 1995 and December 1999, were analysed. 1697 (60.71%) forms were demand for single unit blood. Blood was collected against only 1099 forms (39.34%) out of which 713 (64.88%) were single unit issue. Urgency of requirement and blood group of patients was omitted in 56% cases. 104 forms were received without mention of the indications for transfusion. History of previous transfusion and pregnancy/HDN were omitted in 25.1% and 37.38% cases respectively. At an average 14.61% of the total collection was discarded. Of the 292 units discarded, 242 units were due to non utilisation.

A transfusion committee should be established in all hospitals with a licensed blood bank. It should constitute definite objectives and conduct regular audits (prospective audit, concurrent review or retrospective review), in order to achieve utmost efficiency and numerous benefits, in terms of workload, cost, errors, risks of transfusion and ultimately increased customer satisfaction. It should strive to abolish single unit and inappropriate transfusion, and advocate autologous transfusion.

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KEY WORDS : Audit; Blood bank; Requisition forms.

Introduction

Process or performance improvement is often discussed as one means of adapting to the enormous changes, both fiscal and technological, that are currently occurring in the clinical laboratory. The alteration of a process to achieve efficiency can result in numerous benefits, including decreased workload, cost savings, reduced errors and ultimately increased customer satisfaction [1].

Interest in process improvements to guide the decision to transfuse has increased in the last decade since inappropriate transfusion practice not only carries medical risks, but inappropriate transfusions are costly. A MEDLINE computer search in 1974 revealed zero articles on transfusion and audit, in contrast, more than 70 articles were found for the period between 1993-1998. These articles emphasised the importance of institutions to audit, educate and improve transfusion practices [2]. The American Association of Blood Banks Transfusion Practice Committee has published excellent transfusion audit criteria [3].

The blood requisition form is the culmination of the clinical decision to transfuse. Thus it is a very important and useful document to assess the practice of transfusion services of any institute.

Material and Methods

A retrospective study was conducted on all the blood requisition forms received at the Blood Bank of a Services zonal hospital,

between June 1995 and 1999.

A blood requisition form is designed to provide details of the patient, his address, location of the unit, ward, indication, brief clinical history number of units required, details of previous transfusion and pregnancy. It is also designed to cater information regarding the blood group of the patient and the priority of the demand (most urgent/urgent/not urgent).

Medicolegal, it is essential that the form be signed by the specialist-in-charge or a medical officer, alongwith the date and time of the demand. The registers maintained by the blood bank of the hospital were also scrutinised to collect data regarding the total units collected and the details regarding their issue and wastage. The reasons for wastage were also analysed. The data retrieved from the requisition forms was also crosschecked with that of these registers. Details of autologous transfusion were also evaluated.

All the information was treated as different parameters of study and the result evaluated.

Results

Demand and issue : There was total of 2793 blood requisition forms received by the blood bank of the hospital between June 1995 and 1999. Of this 1697 (60.71%) forms were demand for single unit blood. Blood was ultimately collected from the blood bank against only 1099 requisition forms (39.34%), out of which 713 (64.88%) were single unit issue [Table 1,2].

Analysis of requisition forms : Essential patient information as required by the blood requisition form was provided as per Table-1. It was evident that in a substantial number of demand forms (56% each) there was no mention of the urgency of requirement, nor was there any mention of the blood group that was required.

In most of the forms, brief clinical notes and indication for transfusion were considered synonymous. Around 104 forms did not even mention the indications for transfusion at all. Essential

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TABLE 1

Evaluation of parameters from blood requisition form (June 1995 - 1999)*

Parameters evaluated	Observations
Forms without personal particulars (name, personal number, rank, unit, self/dependent)	2
Priority mentioned (Most urgent / Urgent / Not urgent)	1223 (43.79%)
Blood group mentioned	1216 (43.54%)
Ward of patient not mentioned	68 (2.43%)
Location of unit mentioned	494 (17.69%)
Indication not mentioned	104 (3.72%)
Forms without any mention of projected demand	27
H/o previous transfusion mentioned	2092 (74.90%)
H/o pregnancy / HDN mentioned	1749 (62.62%)
Date and time of demand mentioned	611 (21.87%)
Forms without signature of clinicians	24

* Total number of forms received - 2793.

Total forms received for paediatric transfusions - 115 (4.12%).

Forms with single unit demands - 1697 (60.71%).

* Total number of forms against which blood was issued - 1099 (39.34%).

Total forms against which blood was issued for paediatric transfusions - 114 (10.37%).

Forms against which single unit issued - 713 (64.88%).

TABLE 2

Blood demand and issue June 1995-1999
(In terms of no. of requisition forms)

Year	Total demand	Single unit demand	Total issue	Single unit issue
1995 Jun+	505	318 (62.9%)	187	58 (31.0%)
1996	607	237 (39.0%)	210	129 (61.4%)
1997	497	284 (59.3%)	199	141 (70.8%)
1998	545	382 (70.1%)	246	177 (72.0%)
1999	657	476 (72.4%)	257	208 (80.9%)
Total	2793	1697 (60.8%)	1099	713 (64.88%)

(Single unit demand : Paired t-test : $t=5.915748$; $df=4$; $p=0.004089$)

(Single unit issue : Paired t-test : $t=5.508107$; $df=4$; $p=0.005300$)

TABLE 3

Economy of discards
(In terms of no. of units collected)

Year	Total	Expiry	HIV	HBsAg	Syphilis
1995 Jun+	54	39	5	9	1
1996	34	27	2	4	1
1997	76	71	1	4	0
1998	67	58	1	5	3
1999	61	47	8	2	4
Total	292	242	17	24	9

(Discard due to non-utilisation and discard due to screening)

Paired t-test : $t=4.511096$; $df=4$; $p=0.010731$)

patient profile ie. history of previous transfusion and pregnancy/HDN were omitted in 25.1% and 37.38% cases respectively.

Location of the unit, an essential data for mustering donors,

Fig. 1 : Economy of blood

had been omitted in majority of the cases (82.31%). In 68 forms, there was no mention of the ward of the patient, where blood was required to be sent. Date and time of demand were omitted in 78.13% of the forms. There were 24 forms which were not even signed by the clinicians.

Economy of discard : Blood was discarded if it was tested positive for HIV, HbsAg, Syphilis or malarial parasite during screening; else if it surpassed the recommended shelf life of 35 days. The range of discard varied between 10.83% and 20.65% (average - 14.61%) of the collection (Fig-1). Of the 292 units discarded during the period of the study, the majority ie.242 units (82.8%) were due to non-utilisation during the recommended period of shelf life (Table - 3).

Paediatric transfusion : Out of the total forms received, only 115 were demand for paediatric patients. A total of 167 units were issued against 114 forms. The quality of blood transfused varied between 30 ml and 200 ml, depending on the age and body weight. The common indications for transfusion were thalassaemia, septicemia, prematurity, haemophilia, anaemia and surgery.

Autologous transfusion : There were only 10 cases where autologous transfusion was carried out. The age range of the patients was 30 - 55 years.

Discussion

Medical practice audits can achieve a variety of goals. It is important that a transfusion committee establish defined objectives before beginning the process of medical practice audits. Appropriate goals should include (1)modification of physician behaviour vis-a-vis transfusion therapy; (2)improvement of standards within the hospital; (3)identification and implementation of cost-effective procedures; (4)compliance with regulatory agencies, which require audits and quality assurance activities; (5)providing data to hospital credential committee regarding the performance of individual physicians; (6)identifying and reducing possible risks of malpractice (7)establishment and enforcement of a uniform standard of transfusion practice in the hospital and (8)monitoring of the therapeutic and adverse effects of transfusion. Audit should prompt effective analysis, evaluation, and continuous improvement in the following areas : (1) ordering of appropriate units of blood; (2) distribution, handling and

dispensing of blood; (3) administration of blood and (4) monitoring adverse effects of transfusion. The primary means of implementing transfusion medicine audits have been described as prospective audit (reviewing blood requests before the release of blood products), concurrent review (performed within 1 to 2 days of the transfusion) [4].

A retrospective review of the blood bank of a Services zonal hospital was executed to evaluate this aspect. The findings ratify that proper documentation as per the AFMSF -87 (blood requisition form), should be emphasised at all levels. Mention of the blood group, the urgency of demand (ie. most urgent/urgent/not urgent), clinical indication to transfuse and number of units are a must. These bits of vital information will enable the blood bank to process the demand without loss of valuable time, and plan to arrange for the required number of donors. As evident from the study, the clinical diagnosis is more often than not misinterpreted as the indication for transfusion. It should be stressed that they are not synonymous. Indication should reflect the event that culminates in the decision to transfuse and number of units are a must. For example a case of Road traffic accident does not always require transfusion unless there has been a considerable loss of blood. Since the blood requisition form is an important medicolegal document, it should contain the patient particulars without any error, date and time of demand must be mentioned; and invariably bear the signature of a medical officer.

The major hurdles in the endeavour to successfully project plan and meet requirement of blood for any such zonal hospital are : (1) the strict principles of transfusion medicine; (2) the Drugs and Cosmetics Act (amended 1955, 1960, 1962, 1972, 1992, 1999); (3) limited shelf life of blood; (4) poor awareness amongst commanders, troops and families leading to restricted donor availability; (5) non availability of superspeciality services like cardiothoracic and orthopaedic surgeries (major consumers of any blood bank); (6) absence of a component laboratory and maintaining effective liaison with the civil blood bank, Red Cross and voluntary blood donation organisations. A failure in this enterprise has culminated into a major problem ie. 'wastage due to non-utilisation', as evidenced in this study. To surpass this, not only do we have to cross the hurdles listed above, but also ensure regular contact with the clinicians; activate the Transfusion Committee of the hospital; analyse the figures of previous years and store enough blood for regular use; and adopt healthy policies like that of autologous transfu-

sion. In case of possible non-utilisation, blood should be exchanged from civil blood bank or transferred to the nearest service blood bank, for early utilisation. Emergencies should be handled by mobilising donors from an updated donor panel of the station, maintained in a computer. The Blood Transfusion Assistants can be suitably computer trained to take on this task.

Although paediatric transfusion accounted for only 167 units, it had posed a lot of challenge to the blood bank, and warranted a lot of planning and co-ordination. Since the demand is not very frequent and the quality barely minimal, storing blood in paediatric blood bags for any anticipated future demand is neither feasible nor advisable. This is compounded by the restriction imposed by the strict principles of Transfusion Medicine, which forbids the deplorable primitive practice of transferring blood out of one bag into another, more so in the absence of a laminar flow. To avoid wastage, and to prevent risks of possible over-transfusion, blood stored in adult bags is never issued. The demands are primarily met by collecting blood in double bags. On transferring the requisite blood into the second bag, remaining is stored and issued to any adult patient requiring multiple transfusions. Occasionally, paediatric bags are used, depending on their availability.

A controversial aspect of transfusion medicine, which has been highlighted in the study, is the concept of single unit transfusion. The notion has been discussed in various forums (including the 40th Annual Conference of Indian Society of Haematology and Transfusion Medicine, Dec 1999), and the consensus was to abolish such a practice. By strictly following this criteria, the actual need of a Services zonal hospital, like the one evaluated, can be reduced drastically by around 65% (ie. the average of the demands against which single unit was issued).

To achieve success in his endeavour, the blood bank in-charge has to adopt a multi-prong approach [2]. The first approach is to briefly meet one-on-one with the physicians. Soumerai et al mentions a reduction in inappropriate transfusion among study surgeons from 40% to 24% [5]. The second strategy is to teach at scheduled conferences and hospital seminars. Morrison et al improved transfusion practices in obstetrics and gynaecology by reducing the number of patients undergoing transfusion by 60% [6]. The third approach for process improvement is by taking daily clinical rounds of patients who receive transfusion. Shanberge et al [7] and Giovanetti et al [8] achieved improvement in transfusion practice by this method. The fourth approach is to review each order before

issue (concurrent review), and in case of controversy, to refer the matter to the Hospital Transfusion Committee, Solomon et al [9] and Hawkins et al [10] mentions a reduction in requirement of FFP by 52% and 33% respectively, with this strategy. The fifth method is by way of installing algorithms and guidelines for transfusion in various different clinical settings. Algorithms used by Depotis et al [11] and by Reinertsen et al [12] are few of the successful ones. The final approach is to propagate and popularise the concept of Autologous Transfusion amongst clinicians and patients. This will not only reduce the burden of the blood bank but also abate the risks of transfusion transmittable diseases.

Regular audit of blood demand, proper documentation and adopting successful strategies as enumerated above, will diminish the practice of single unit transfusion [2,13]. This will reduce the instances of inappropriate transfusions, where the risks of transfusion transmittable diseases, transfusion reactions and sensitisation are more than the benefits. It must be emphasised that transfusion is not a placebo and has its inherent hazards. It should be used only when the clinical benefits outweigh the risks. Suboptimal doses of blood components and products expose patients to the risks without any attendant benefits. Transfusion centres and the hospital transfusion committee (comprising specialists from the Departments of Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, Anaesthesiology and Pathology) should advocate rational transfusion practices and attempt to influence usage [14].

The consensus conference on TAH held in New Delhi (1996) has also emphasised the safety and efficacy of transfusion services. They advocate the necessity of voluntary blood autologous transfusion, mandatory screening of transfusion transmittable diseases, quality control (internal and external), donor awareness programmes, recipient surveillance programmes, auditing and setting up of consultative group [15]. This will enable the blood bank to plan its requirement judiciously and avoid unnecessary wastage. Ultimately it will result in decrease in the workload, cost, errors and risks related to transfusion, and finally increase

customer satisfaction.

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