

## UTILIZATION OF BLOOD IN ELECTIVE CHOLECYSTECTOMY

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### ABSTRACT

**Objective:** To evaluate Blood Ordering and Transfusion ratios for elective cholecystectomy.

**Patients and Methods:** All patients who underwent elective cholecystectomy in Surgical Unit III, Civil Hospital, Karachi from December 2005 to November 2006 were included in this study. Blood units cross matched and units transfused intra-operative and post-operatively were recorded apart from patient demography and hepatitis profile.

**Results:** A total of 132 patients underwent elective open cholecystectomy during the study period. Total 181 blood units arranged, among these only nine units of blood were transfused. This means only 4.9% of blood was utilized while 95.1% of blood was not utilized. Cross-match to transfusion ratio = 20.11, Transfusion probability=6.8 and Transfusion index=0.06.

**Conclusion:** For elective cholecystectomy, there is no need for routine cross matching of blood. However, one must confirm the availability of blood for Hepatitis B and Hepatitis C reactive patients, and for cases with recurrent acute cholecystitic attacks.

**KEY WORDS:** Blood transfusion, Elective Cholecystectomy, Cross-match to transfusion ratio, Transfusion probability, Transfusion index.

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### INTRODUCTION

Transfusion of blood is often a life-saving measure in surgical patients, though uncommon in elective surgeries.<sup>1</sup> Many a times blood units routinely ordered before elective surgery are not utilized, but as they are held in reserve,

they are unavailable for other patients who might be in urgent need of transfusion. This imposes storage problems for blood bank, loss of shelf life and wastage of blood.<sup>2</sup> The ready availability of blood and blood components has resulted in liberal use of blood transfusions. The increasing demand for blood and blood products, together with rising costs and transfusion associated morbidity led to a number of studies in late 1970s reviewing blood ordering and transfusion practices.<sup>3</sup> For elective surgeries, over ordering of blood is a common practice. This can be decreased by simply changing the pattern of blood cross matching and ordering, in relation to the different type of surgery performed.<sup>4</sup>

In our department, we routinely arrange one unit of blood for elective cholecystectomy and two units for HBsAg or Anti HCV reactive patients. Studies have shown that there is very little blood utilization during cholecystectomies (open / laparoscopic).<sup>4</sup> The principle aim of this study was to evaluate and improve the efficacy of ordering system for elective chole-

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cystectomy in order to reduce the unnecessary burden on the blood bank.

### PATIENTS AND METHODS

All patients who underwent elective cholecystectomy in Surgical Unit III, Civil Hospital Karachi, during a one year period of (December 2005 to November 2006) were included in this study. Blood units cross matched, number of units transfused intra-operative and post-operatively, and reasons for transfusion were recorded. Hepatitis profile for Hepatitis B and Hepatitis C are routinely done in all our patients as a policy.

Patients with pre-operative suspicion of malignancy and those with intra-operative findings of any pathology other than cholelithiasis, were excluded. All patients underwent open cholecystectomy. Intra-operative loss of blood was calculated by measuring the volume in the suction bottle and blood soaked swabs. Hemoglobin measured was routinely done on first post operative day.

Following indices were calculated from the data:

*Cross-match to Transfusion (C/T ratio) ratio =*

$$\frac{\text{No. of units cross-matched}}{\text{No. of units transfused}}$$

A ratio of 2.5 is considered as significant for blood usage.

*Transfusion Probability (%T) =*

$$\frac{\text{No. of patients transfused}}{\text{No. of patients cross-matched}} \times 100$$

A value of 30 was considered indicative of significant blood usage.

*Transfusion Index (T<sub>i</sub>) =*

$$\frac{\text{No. of units transfused}}{\text{No. of patients cross-matched}}$$

A value of 0.5 was considered indicative of significant blood utilization.

### RESULTS

Patient's demography and their hepatitis B and C profile is shown in Table-I. Our of total 181 blood units arranged for 132 patients, only nine units were transfused in eight patients. This means that only 4.9% of blood was utilized while 95.1% of blood was not needed

Table-I: Patients Demography and hepatitis profile

Variable	No. of Patients (%)
Gender	
Male	28 (21.2)
Female	104 (78.8)
Hepatitis Profile	
HbsAg +ve	7 (5.3)
Anti HCV +ve	16 (12.1)
Both +ve	2 (1.5)
Recurrent attacks of Acute Cholecystitis	11 (8.3)

(Table-II). Cross-match to Transfusion (C/T) ratio was 20.1, Transfusion Probability (%T) 6.06 and Transfusion Index (T<sub>i</sub>) 0.06.

Eight patients who required blood transfusion included two Hepatitis B and three Hepatitis C positive cases. Three patients with marked adhesions due to recurrent attacks of acute cholecystitis, bled more than usual and had a hemoglobin drop >1 gm%, needing blood postoperatively.

### DISCUSSION

The optimal function of a surgical department depends on the efficient round-the-clock blood availability from the blood bank.<sup>1</sup> There is a tendency to order blood in excess, either by asking for an increased number of units or as a standby precautionary measure. This places increased demands on blood banks, as it is difficult to mobilize an equal number of blood donors.<sup>5</sup> In our study, only 4.9% of blood was utilized out of 181 units of blood arranged for cholecystectomies. This practice of ordering was probably because of the fear that blood will not be available, if needed.

The use of the C/T ratio was first suggested by Boral Henry.<sup>3</sup> A C/T ratio of 2.5 was suggested to be indicative of significant blood usage. A C/T ratio of > 2.5 means that lesser number of units cross-matched were transfused. Our study showed a C/T ratio of 20.1

Table-II: Blood ordering and transfusion pattern of patients

Variable	Unit	Units
	Cross-matched	Transfused
Patients	132	8
Blood Units	181	9

which means that less than 5% units of blood were transfused for elective cholecystectomy. Mead et al<sup>6</sup> suggested the probability of a transfusion for the any procedure (%T). A value of 30 has been suggested as significant, our figure for transfusion probability was only 0.06. The average number of units used per patient cross-matched is indicated by  $T_i$  and signifies the appropriateness of number of units ordered. Boral and Henry<sup>3</sup> suggested that a procedure which uses <0.5 units of blood per procedure does not require a pre-operative cross-match. A value of 0.5 is indicative of significant blood usage; our study showed a value of 0.06 (Table-II).

Some reports have revealed that non-transfused blood units were cross-matched 3-10 times for different patients.<sup>7</sup> When calculating the time spent performing these cross-matches, it was estimated that a technician can cross-match three units per hour. This results in 54.5% wasted technician working time, leading to an average blood bank annual loss of US\$25,000.00 for one 120-bed department of surgery.<sup>8</sup>

In 1995 the blood bank at Queen Elizabeth Hospital, received 35203 requests for blood and blood products. Out of these 25503 (72.4%) were complied with, including all emergency requests. However, only 10303 (40.4%) requests complied with were actually utilized. The CT ratio was 3.4.<sup>9</sup> A ratio beyond 2.0 is indicative of excessive ordering. The CT ratio of our study was 20.1 which demonstrate an excessive blood ordering pattern.

Awareness of the hazards of blood transfusion is becoming more obvious due to the expansion of various aspects of blood transfusion services and the increased understanding of transfusion science in recent years.<sup>10</sup> Serious hazards of transfusion (SHOT) are well documented which include incorrectly administered blood, acute and delayed transfusion reactions, transfusion related acute lung injury, transfusion associated graft-versus host disease, post-transfusion purpura and transfusion transmitted infections.<sup>11</sup> Cross matching blood only when genuinely required reduces the number of cross matches, saves the

patient from an instinctive reaction on the part of the attending doctor to transfuse simply because blood is available and it is certainly cost effective.

## CONCLUSION

For elective cholecystectomy there is no need for routine cross match, only blood grouping of patient should be done but one must confirm the availability of blood for hepatitis B & hepatitis C positive patients and cases with recurrent cholecystitis attacks. This will lead to monetary savings and more effective blood utilization.

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