

# Study of Blood Products Utilization in Major Departments of Imam Reza Hospital, Kermanshah, Iran

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## Abstract

**Background:** In the present study the amount of requested blood products in major departments of Imam Reza Medical Center, Kermanshah, Iran has been studied to evaluate the necessity of these requests and also the amount of blood products wastage because of unnecessary requests.

**Materials and Methods:** In the present study the information related to 4832 unit of requested blood products from Iranian Blood Transfusion organization from January 2011 to July 2012 in major (internal medicine, obstetrics and gynecology, pediatrics, general surgery) departments of Imam Reza Medical Center, Kermanshah, Iran were evaluated. All data related to these requested blood products were analyzed using SPSS version 16 software.

**Results:** The internal medicine department had the highest amount of blood products requests and also the highest percentage of unnecessary requests causing the waste of products (60% of requested blood products were wasted in this department). The lowest rate of waste was observed in pediatrics department (38.3%).

**Conclusion:** At the present a high percentage of blood products requests were found to be unnecessary. An education program to improve the awareness and knowledge of health personnel about the transfusion medicine and also preparation of local guidelines for blood ordering system is essential for appropriate use of blood products. The reduced amount of wastage will also be an essential step in improving the safety of blood transfusion.

**Keywords:** Blood, indication, wastage, Iran.

## Introduction

The aim of the blood transfusion is to help patients with a wide variety of conditions to cope with the consequences of the blood or blood products shortages<sup>1</sup>. Although blood transfusion is a main pillar of modern medicine it is accompanied by numerous side effects including transmission of serious blood born infections like HIV, CMV and hepatitis<sup>2,3</sup>. Also the production, conservation and transfer of blood products is a lengthy and expensive procedure which inflicts a considerable burden on the national health systems all over the world. World Health Organization has estimated that the production and conservation of a single unit of blood costs around 56 US Dollar which shows

the necessity utmost vigilance in reducing the amount of wasted blood products<sup>4</sup>. At the present a serious shortcoming of health care systems is the high amount of unnecessary blood requests which leads to a sizable amount of blood products to be wasted. The aim of the present study was to evaluate the requested blood products from Iranian Blood Transfusion organization from January 2011 to July 2012 in major (internal medicine, obstetrics and gynecology, pediatrics, general surgery) departments of Imam Reza Medical Center, Kermanshah, Iran to see if there is a high amount of unnecessary blood requests and also if there is a difference between major departments regarding

the amount of wasted blood products.

## Materials and methods

In the present study the amount of requested blood products in major departments of Imam Reza Medical Center, Kermanshah, Iran was studied to evaluate the necessity of these requests and also the amount of blood products lost because of unnecessary requests. The study was approved by the ethics committee of the Imam Reza Medical Center. The study was performed in three steps. In the first step all information regarding blood products requests during the time frame of the study was extracted from the hospital's blood bank documents and also the medical histories of all patients for whom a blood product was requested was thoroughly studied. All necessary information was extracted using four different predesigned special questionnaires based on the reference books related to each specialty. In the second step using the extracted information regarding the cause of hospitalization, the cause of blood product request, laboratory findings, patients' vital signs and other related factors a decision regarding the necessity of blood requests was made by a panel of experts. Finally in the third step the actual amount of blood products which were used, returned to blood bank or wasted were recorded based on the nursing

records. All data were analyzed using SPSS software version 16 (SPSS Inc., Chicago, Illinois). P values less than 0.05 were considered statistically significant.

## Results

During the period of the study 4832 unit of blood products were requested for 994 patients. Table 1 summarizes the information regarding the amount and variety of requested blood products in each major department.

The different departments were compared considering their blood products requested. In total 1776 units of Packed Cells (PC) were requested for 894 patients. Out of these 893 units had justified indication (50.3%) and out of these 890 units were actually used for patients and 3 units were wasted. This means that 883 (49.7%) units of PC have been requested without indication. Out of these 681 units were actually used and 202 units were wasted, so in total 886 (49.9%) of PC units were requested without justification or have not been used even when ordered correctly (Table 2).

The highest number of unjustified PC orders plus justified orders which were not actually used was observed in obstetrics and gynecology department with 212 units (57.3% of total requests) and the lowest was in pediatrics department with 86 units (37.2% of total requests).

In total 569 units of FFP were requested for

**Table 1:** The requested blood products in each major department studied.

Department	Blood product				
	Packed Cell (PC)	Fresh Frozen Plasma	Platelet Concentrates	Cryoprecipitate	Total
Internal Medicine	686	161	1910	83	2840
Pediatrics	231	91	45	0	367
General Surgery	489	236	115	37	877
Obstetrics and gynecology	370	81	297	0	748
Total	1776	569	2367	120	4832

**Table 2:** Distribution PC requested with and without indication in different departments.

Department	Units with indication which were used	Units with indication which were not used	Units without indication which were used	Units without indication which were not used	Total
Internal Medicine	8/47328(%)	0	296(1/43%)	62(1/9%)	686
Pediatrics	145(8/62%)	0	52(5/22%)	34(7/14%)	231
General Surgery	259(53%)	1(2/0%)	163(3/33%)	66(5/13%)	489
Obstetrics and Gynecology	158(7/42%)	2(5/0%)	170(64%)	40(8/10%)	370

**Table 3:** Distribution of FFP requests with and without indication in different departments.

Department	Units with indication which were used	Units with indication which were not used	Units without indication which were used	Units without indication which were not used	Total
Internal Medicine	42(6/26%)	1(1/0%)	98(8/60%)	20(4/12%)	161
Pediatrics	57(6/62%)	0	25(5/27%)	9(10%)	91
General Surgery	107(4/45%)	0	123(1/52%)	6(5/2%)	236
Obstetrics and Gynecology	29(8/35%)	0	50(7/61%)	2(5/2%)	81

185 patients. Out of these 236 units had justified indication (41.5%) and out of these 235 units were actually used for patients and 1 unit was wasted. This means that 333 (58.5%) units of FFP have been requested without indication. Out of these 296 units were actually used and 37 units were wasted, so in total 334 FFP units were requested without indication or have not been used even when ordered correctly (Table 3).

The highest number FFP orders without indication plus correct orders which were not

actually used was observed in internal medicine department with 119 units (73.9% of total requests), and the lowest was in pediatrics department with 34 units (37.4% of total requests).

In total 2367 units of platelet concentrates were requested for 200 patients. Out of these 926 units had justified indications (39.1%); which were all used. This means that 1441 (60.9%) units of PC have been requested without indication. Out of these 1428 units were actually used and 13 units were wasted (Table 4).

**Table 4:** Distribution of platelet concentrates requested with and without indication in different departments.

Department	Units with indication which were used	Units with indication which were not used	Units without indication which were used	Units without indication which were not used	Total
Internal Medicine	722(8/37%)	0	1183(9/61%)	5(3/0%)	1910
Pediatrics	26(8/57%)	0	16(6/35%)	3(6/6%)	45
General Surgery	53(46%)	0	62(54%)	0	115
Obstetrics and Gynecology	125(42%)	0	167(3/56%)	5(7/1%)	297

**Table 5:** Distribution of cryoprecipitate requested with and without indication in different departments.

Department	Units with indication which were used	Units with indication which were not used	Units without indication which were used	Units without indication which were not used	Total
Internal Medicine	43(8/51%)	0	40(2/48%)	0	83
Pediatrics	0	0	0)	0	0
General Surgery	27(9/72%)	0	10(1/27%)	0	37
Obstetrics and Gynecology	0	0	0	0	0

The highest number of platelet concentrates ordered without indication plus correct orders, which were not actually used, was observed in internal medicine department with 1188 units (62.2% of total requests) and the lowest was in pediatrics department with 19 units (42.2% of total requests).

In total 210 units of cryoprecipitate were requested for 10 patients during the course of study. There was no request from the pediatrics and obstetrics and gynecology departments for this product. Table 5 summarizes the requests for this

blood product in different departments.

In total internal medicine department and gynecology and obstetrics departments had the highest percentage of blood products requested without indication or requested correctly but not used with 60% and 58.3% respectively and the least percentage was observed in pediatrics department (37.9%).

## Discussion

In the present study out of 1776 units of requested PC in four studied departments 883

(49.7%) units were requested without indication. The highest percentage of wasted PC was observed in gynecology and obstetrics department with 57.3% and the least percentage was observed in pediatrics department (37.2%). This finding is in line with Edwards et al.<sup>5</sup>, Wallis et al.<sup>6</sup>, and Karami et al.<sup>7</sup>, findings.

The interesting point is that in the majority of other studies the hemoglobin levels has been used as the only parameter for determining the indication for blood product request<sup>7</sup>, but we also used the patients' clinical conditions.

Out of 569 units of requested FFP 333 units (58.5%) were requested without a justified indication. The highest number of FFP requests without indication was observed in internal medicine department with 73.9% and the least number of requests without indication was observed in pediatrics department (37.4%). In a study by Entezari Asl et al.<sup>8</sup>, and in another study by Haghi Ashtiani et al.<sup>9</sup>, 47.2% and 24.5% of FFP requests have been without a justified indication.

Out of 2367 unit of platelet concentrates 1441 (60.9%) did not have a justified indication. The internal medicine and pediatrics department with 62.2% and 42.2 Entezari ASL et al.<sup>8</sup>, have reported 80% of unjustified platelet concentrates requests while Mossayebi et al.<sup>10</sup>, have reported that all their platelet concentrates injections have had a justified indication.

In total in our study about 55 percent of the total blood products requests were not justified or were not used after being correctly requested. Among four studied departments the internal medicine department and obstetrics and gynecology department with 60% and 58.3% of their total blood requests being without indication or requested correctly but not used had the highest percentage of blood products requested without indication or not being used after a correct request. These findings are in line with findings by Edwards et al.<sup>5</sup>, Sajwani et al.<sup>11</sup>, and Wallis et al.<sup>6</sup>.

Also the lowest percentage of blood products requested without indication or not used after being correctly requested was observed in pediatrics department (37.9% of total requests.).

The interesting observation during the present study was that despite the high percentage of blood requests without indication the number of requests being canceled or the blood products

being returned to blood bank were minimal.

During the six months duration of the present study only 27 units of unused PC (3%) and 5 units of unused FFP (1.5%) were returned to blood bank or their request was canceled.

In studies by Wallis et al.<sup>6</sup>, and Haghi Ashtiani et al.<sup>9</sup>, the percentage of returned blood products have been reported to be much higher than our findings. In our study the highest number of returned products was observed in pediatrics department with 16 units and the lowest in gynecology and obstetrics department with no units returned.

## Conclusion

At the present a high percentage of blood products requests were found to be unnecessary. An education program to improve the awareness and knowledge of health personnel about the transfusion medicine and also preparation of local guidelines for blood ordering system is essential for appropriate use of blood products. The reduced amount of wastage will also be an essential step in improving the safety of blood transfusion.

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