



DEMAND AND SUPPLY DEFICITS IN A TERTIARY CARE CENTRE
BLOOD BANK: PROBLEMS AND CHALLENGES

Rabindra Kumar Singh	Assistant Professor, Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India.
Saurav Banerjee	Tutor, Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India
Ramesh Kumar Shrivastav	Professor, Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India.
Purnima Bharati	Junior Resident, Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India
Anu Singh	Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India.

ABSTRACT

Blood donation is a major concern in a society as the donated blood is life saving for patients who need it. Globally, approximately 80million units of blood are donated each year. One of the biggest challenges to blood safety is assessing safe and adequate quantities of blood and blood products.
Aim: This study was conducted to determine and compare the deficits in demand and supply of various blood groups from years 2013-2015
Settings and Design: It was a retrospective study carried out at Blood Bank.
Materials and Methods: A study was conducted at Blood bank, RIMS, Ranchi, Jharkhand, over a period of 3 years from January 1, 2013, to December 31, 2015. Deficits of individual blood groups were calculated and compared.
Results: There is an absolute minor deficit of A positive blood group in all the three years under study.

KEYWORDS :

Introduction

Voluntary blood donors are the cornerstone of a safe and sufficient supply of blood products. The safest blood donors are voluntary, non-remunerated blood donors from low-risk populations¹. In India, the collection of most of the blood from voluntary, non-remunerated blood donors from low-risk population happens in voluntary blood donation camps (VBDC)^{2,3}. Still, most of the blood banks frequently suffer from scarcity of blood. Unlike countries where structured and robust vigilance and surveillance systems exist as part of national entities, in India no such system is in place to assess the adherence to the laid out guidelines for blood collection⁴. And even though it seems there is surplus of blood supply in a blood bank, the real scenario is very different as some particular blood groups are in excess, while some fall short.

Objectives

This study was conducted to determine the lag of demand and supply of various blood groups in the blood bank of Rajendra Institute of Medical Sciences (RIMS), Ranchi, A premier institute of Jharkhand.

Tables

Demand and supply of blood in 3 years											
2013				2014				2015			
BG	Dem and	%	Sup ply	%	Dem and	%	Sup ply	%	Dem and	%	Sup ply
A+	2654	16.1	249	14.4	4872	20.4	431	16.4	6316	20.9	590
	1		7	3		13	5	5		0	8
A-	72	0.44	108	0.62	152	0.6	144	0.55	180	0.60	204
					3						
B+	6435	39.0	714	41.3	8476	35.0	987	37.6	9952	32.9	117
		6	6	0		02	6	6		3	99
B-	132	0.80	215	1.24	192	0.7	303	1.16	402	1.33	440
					9						
AB+	979	5.94	118	6.83	1422	5.8	156	5.95	2714	8.98	265
			1			8	1				0

AB-	42	0.25	36	0.21	39	0.1	70	0.27	61	0.20	93	0.28
						6						
O+	6045	36.6	599	34.6	8891	36.7	971	37.0	1043	34.5	112	34.5
		9	4	4		74	6	5	7	3	96	6
						0.6						
O-	117	0.71	125	0.72	157	5	241	0.92	164	0.54	298	0.91
	1647	100.	173	100.	2420		262		3022	100.	326	100.
	6	00	02	00	1	100	26	100	6	00	88	00

Table 1- Demand and supply of blood in 3 years

Replacement Collection			
Bl.group	2013	2014	2015
A+	1436	3258	4418
A-	62	106	143
B+	5672	8216	9357
B-	146	262	336
AB+	822	1184	2078
AB-	26	68	78
O+	4218	7932	8979
O-	55	184	224
	12437	21210	25613

Table 2- Replacement collection from admitted patient relatives.Total collection-5926

Collection from blood donation camps			
Bl.Group	2013	2014	2015
A+	1061	1057	1490
A-	46	38	61
B+	1674	1660	2442
B-	69	41	104
AB+	359	377	572
AB-	10	2	15
O+	1576	1784	2317
O-	70	57	74
	4865	5016	7075

Table 3-Collection from blood donation camps. Total collection-16956**Results and analysis**

Total collection from blood donation camps and replacement collection from Jan 2013 to dec 2015 is 76216. While the demand for all blood groups in these 3 years was 70993. There is an overall increase (nearly 30%) in the demand of blood in these three years, and the rising trends have been met with organizing more blood donation camps. A marked increase in incoming patients was seen in 2015, compared to 2013 and 14. Though it seems that a surplus of overall supply is there, some blood groups always fall short, while some are wasted due to excess. Overall collection excess is present in all the three years, on an average by 6.67%. In considering the less prevalent blood groups, A positive blood group has always been short in all the three years, by 1.68% in 2013, 3.68% in 2014 and 2.83% in 2015. An unusual finding was obtained in the year 2013 where O positive blood group also became short by 2.05%, which is likely a chance effect.

Discussion

The motive of the study is to know demand and supplies of the four blood groups so that no patient dies due to lack of a particular blood group. Furthermore, knowledge of the lacking groups helps in facilitating collection from those blood groups especially from blood camps. A study on the knowledge, attitude and the practice of the donors may prove to be useful in the successful implementation of the blood donation programme². This study was specifically conducted on all blood collections in the blood bank including the replacement donors of the admitted patients. In our area, there is a relative deficit of Blood group "A" supply compared to the demand in all the three years. Similar finding has been obtained in previous study conducted here on voluntary blood donors⁵. This may be attributed to the point that there are more A positive patients requiring blood donation, which is likely a chance effect. But the deficit amount can be managed effectively by encouraging healthy donors of A positive blood group to donate blood more frequently. The same principle can also be applied for rarer subgroups. Various other factors like shelf life of stored blood, rejection during screening process and replacement donation also affect the supply of the blood of a particular subgroup.

Conclusion

A beforehand knowledge of the deficient blood groups helps to prioritize the patients before giving blood transfusion. There is an absolute minor deficit of A positive blood group in the blood bank at RIMS, and this should be managed by luring more A positive healthy people to donate blood at voluntary blood donation camps.

References

1. New Delhi: National AIDS Control Organisation, Ministry of Health & Family Welfare, Government of India; 2007. [Last accessed on 2013 Nov 07]. Voluntary Blood Donation Program—An Operational Guideline; p. 79.
2. New Delhi: National AIDS Control Organisation Ministry of Health & Family Welfare, Government of India; 2006. [Last accessed on 2013 Nov 07]. Standards of Blood Banks and the Blood Transfusion Services; p. 108.
3. Central Drugs Standard Control Organization Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; [Last accessed on 2013 Nov 07]. Regulatory Requirements of Blood and/or Its Components Including Blood Products.
4. World Health Organisation; 2010. [Last accessed on 2014 Aug 22]. Aide-Mémoire: Developing a National Blood System.
5. Singh A, Srivastava RK, Deogharia KS, Singh KK. Distribution of ABO and Rh types in voluntary Blood donors in Jharkhand area as a study conducted by RIMS, Ranchi. J Family Med Prim Care 2016;5:631-6.