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The Hemotransfusion Analysis on the Example of Specialized Department of Multidisciplinary clinic

ABSTRACT

The analysis of the carried-out hemotransfusion in coloproctological department of multidisciplinary clinic has shown stable need for the following components of blood: erythrocyte containing environment and fresh frozen plasma.

Development tendencies are transfusion of quarantine fresh-frozen plasma, the erythrocyte containing environment which was exposed to leukofiltration.

Keywords: hemotransfusion, transfusion of components of donor blood, erythrocyte containing environment, fresh frozen plasma, transfusion volume.

INTRODUCTION

Nowadays high efficiency of hemotherapy of purposeful use of cellular and protein components of blood in the patient depending on treatment tactics is obvious. Besides, such tactics gives the chance to use the preserved blood bank rationally [1]. According to the data of the staff of National Centre of Medicine and Surgery named after N. I. Pirogov , the rational expense of transfusion environments promotes the increase of efficiency of health care costs, medical clinics' efficiency, saving national resource of donor blood [2].

According to requirements of applied medicine, the organization of component donorship and fractionation of blood into components, the centralized accounting of the blood components ordered by the treatment-and-prophylactic establishments (MPI) – the most important problems of establishments of blood bank services. MPI keeps obligatory account of the received used and unused components of blood [3].

Research objective. In this article we provide the analysis of hemotransfusion in specialized department of multidisciplinary clinic of Republic hospital №2, Republic center of the emergency care in 2008-2013.

Research material. The coloproctological department (CD) of republic hospital №2 (RH№2) of the center of the emergency care (RCEC) is the only specialized department in the Republic of Sakha (Yakutia) for hospitalization of patients with various diseases of large intestine, anal canal and perinea. Nowadays this department performs operations of different complexity

(from I to VI). Operations of high complexity are followed by transfusion of components of donor blood. The name and volumes of the transfused blood components are presented in table 1 for the analyzed period.

Table 1

The volume of the blood components transfused for the analyzed period, liter

Name of components	**Years**				
	2009	**2010**	**2011**	**2012**	**2013**
Erythrocyte concentrate	47,568	50,729	36,370	23,777	19,518
Erythrocyte concentrate, filtrated			1,986	16,689	20,964
Washed erythrocytes	600	566	3,146	2,231	9,748
Total	**48,168**	**51,285**	**41,502**	**42697**	**50,230**
Fresh frozen plasma	115,578	287,244	127,238	82,591	63,990
Fresh frozen plasma, inactivated virus			5,470	12,903	1,445
Total	**115,578**	**287,244**	**132,708**	**95,494**	**65,435**
Platelet suspension				3828	750
Total				**3828**	**750**

Table 1 data testify that the main used haemotransfusion environments in the department are erythrocyte concentrate and fresh frozen plasma. Growth of volumes of the transfused erythrocyte concentrate is caused by the increased transfusion volumes of the erythrocyte concentrate filtered and washed erythrocytes. The twice decrease of transfused fresh frozen plasma volume has been noted by the end of the analyzed period.

The quantity dynamics of the haemotransfusion environments has been presented in table 2 for the analyzed time.

Table 2

The number of hemotransfusions for the analyzed period

Name of components	**Years**				
	2009	**2010**	**2011**	**2012**	**2013**
Erythrocyte concentrate	219	230	163	104	92
Erythrocyte concentrate, filtrated		9	9	55	64
Washed erythrocytes	2		16	10	31
Total	**221**	**239**	**188**	**169**	**187**
Fresh frozen plasma	195	360	355	198	149
Fresh frozen plasma, inactivated virus			21	64	3
Total	**195**	**360**	**376**	**262**	**152**
Platelet suspension				6	3
Total				**6**	**3**
Total	**416**	**599**	**564**	**437**	**342**

The table 2 analysis has shown twice decrease of number of fresh frozen plasma transfusion for the analyzed period, at the same time the number of erythrocyte concentrate transfusions also tends to decrease.

Table 3

The distribution of recipients by sex and age

Year	Sex	Age							
		18-29	**30-44**	**45-59**	**60-74**	**75-90**	**90 ↑**	**Total**	**Total**
2009	M	5	16	38	20	8		87	**161**
	F	6	9	17	30	11	1	74	
2010	M	6	7	23	26	5		67	**137**
	F	4	12	22	23	8	1	70	
2011	M	8	9	38	25	9		89	**155**
	F	5	5	19	21	16		66	
2012	M	7	10	17	30	11		75	**146**
	F	1	9	22	27	11	1	71	
2013	M	6	23	26	22	11	1	89	**172**
	F	3	22	22	26	10		83	
Total		51	122	**244**	**250**	100	4	**771**	**771**

MAIN RESULTS

As you can see, the main haemotransfusion environments are the erythrocyte concentrate and fresh frozen plasma for the analyzed time period.

The increase of transfused volume of erythrocyte containing environment is caused by the gradual transfusion increase of erythrocyte concentrate filtered and washed erythrocytes despite of the decrease of erythrocyte concentrate volume twice.

For the analyzed time period, fresh frozen plasma transfusion was reduced in volume and number almost twice. Besides fresh frozen plasma transfusion inactivated virus had been introduced by 2013.

The greatest number of recipients are elder patients (60-74 years) - 250 and middle age (45-59 years) – 244 for the analyzed years.

The ratio of volumes of fresh frozen plasma transfusion and erythrocytes (table 4) for the last 3 analyzed years remains lower than 2:1.

Table 4

The ratio of volumes of fresh frozen plasma transfusion and erythrocytes

Name of components	**Years**									
	2009		**2010**		**2011**		**2012**		**2013**	
	Vb	Nh	Vb	Nh	Vb	Nh	Vb	Nh	Vb	Nh
Erythrocyte concentrate	47, 568	219	50, 729	230	36, 370	163	23, 777	104	19, 518	92
Erythrocyte concentrate, filtrated				9	1, 986	9	16, 689	55	20, 964	64
Washed erythrocytes	600	2	566		3, 146	16	2, 231	10	9, 748	31
Total	**48, 168**	**221**	**51, 285**	**239**	**41, 502**	**188**	**42, 697**	**169**	**50, 230**	**187**
Volume of erythrocyte containing environment per 1 transfusion	217,95		214,58		220,75		252,64		268,60	
Fresh frozen plasma	115, 578	195	287, 244	360	127, 238	355	82, 591	198	63, 990	149
Fresh frozen plasma, inactivated virus					5, 470	21	12, 903	64	1, 445	3
Total	**115, 578**	**195**	**287, 244**	**360**	**132, 708**	**376**	**95, 494**	**262**	**65, 435**	**152**
Volume of fresh frozen plasma per 1 transfusion	597,70		797,90		352,94		364,48		430,49	
Fresh frozen plasma: erythrocyte containing environment	**2,7:1**		**3,7:1**		**1,6:1**		**1,4:1**		**1,6:1**	

Notes: Vb - volume of the blood components transfused for the analyzed period in the department, liter; Nh - Number of hemotransfusions for the analyzed period.

Indications for transfusion therapy were:

1) extensive surgical operations of tumors and damages of large intestine (IV-VI category

of complexity);

2) reconstructive and recovery operations of large intestine (IV-VI category of complexity);

3) intestinal bleeding in inflammatory bowel disease, diverticular disease, polyps of large intestine;

4) 37 (4,8%) patients from the total number 771 for the analyzed period, the transfusion of erythrocytes has been administered before surgical treatment of the chronic anemia (decrease of hemoglobin level lower than 60-70 g/l) caused by the chronic hemorrhoids complicated by hemorrhoid bleeding.

CONCLUSION

Thus, the analysis of the carried-out hemotransfusion in coloproctological department of multidisciplinary clinic has shown stable need for the following components of blood: erythrocytes containing environment and fresh frozen plasma.

From the total number of recipients 250 (32,43%) are elder people (60-74) and 244 (31,64%) – middle age (45-59).

37 patients (4,8%) were administered hemotransfusion in decrease level of the hemoglobin lower than 60-70 g/l caused by the chronic hemorrhoids complicated by hemorrhoid bleeding.

The ratio of volumes of the transfused fresh frozen plasma and erythrocytes for the last 3 analyzed years remains lower than 2:1.

Development tendencies are transfusion of quarantined fresh frozen plasma, the erythrocytes containing environment which was exposed to leukofiltration.

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