Received: 1 December 2015 / Accepted: 21 February 2016 / Published online: 25 March 2016

UDC 616.15:614.2(492)

BLOOD SERVICE IN FINLAND

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Abstract

The goal of the post is to summarize the experience of blood service in Finland by the result of the business move and examination of the service activities at the point.The research materials indicate that the blood service in Finland is a non-profit organization and is an independent part of the Finnish Red Cross (FRC). All expenses and development of Blood Service are covered by the sale of blood and blood products and expert services in the Finnish health care system. It is responsible for providing blood products throughout Finland in a centralized manner. Its task is to organize blood donation and blood collection and testing of blood, preparation of blood products and their distribution in hospitals, maintain a register of the Finnish stem cells for transplantation. In the country there is a decrease in the dynamics of the volume of the red cells sale related to the introduction of new alternative treatments for patients.

Keywords: Finland, donation, stem cells, testing of blood products, financing.

Резюме

СЛУЖБА КРОВИ ФИНЛЯНДИИ

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Цель сообщения обобщить опыт организации службы крови в Финляндии по результатам служебного выезда и ознакомления деятельностью этой службы на месте.

Материалы исследования показывают, что служба крови Финляндии является некоммерческой организацией и входит в независимую часть Финского Красного Креста (FRC). Все свои расходы и развитие служба крови покрывает за счет продажи крови и ее продуктов, экспертных услуг в финской системе здравоохранения. Она несет ответственность за предоставление продуктов крови по всей Финляндии в централизованном порядке. В ее задачи входит организация донорства крови и сбора крови, а также тестирование донорской крови, изготовления продуктов крови и их распространение в больницах, ведет реестр Финских стволовых клеток для трансплантации. В стране имеет место динамика снижения объема продажи продукции крови, связанная с внедрением новых альтернативных методов лечения больных.

Ключевые слова: Финляндия, донорство, стволовые клетки, тестирование препаратов крови, финансирование.

Түйіндеме

ФИНЛЯНДИЯДАҒЫ ҚАН ТАПСЫРУ ҚЫЗМЕТІ

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Ақпарат мақсаты қан қызметі әрекетімен орнында танысу бойынша және жұмыс нәтижелері бойынша Финляндияның қан қызметі ұйымының тәжірибесін біріктіру. Зерттеу материалдары көрсеткендей, Финляндияның қан қызметі коммерциялық емес ұйым болып келеді және Фин Қызыл Крест (FRC) тәуелсіздік бөліміне кіреді. Қан қызметі барлық шығыс және даму қаражаттарын қан және оның өнімдерін сату және денсаулық сақтау саласының қаражат жүйесіндегі сараптама қызметін көрсету арқылы толықтырады. Олорталық тандыру тәртіп түрінде Финляндия бойынша қан өнімдерін ұсынуына жауапты. Оның міндетіне донор қанын және қан жинауды ұйымдастыру, сонымен қатар донор қанын тестілеу, қан өнімдерін дайындау және оларды ауруханаларға тарату, трансплантацияға арналған Фин бағаналы жасушаларына реестр жүргізу кіреді. Елде қан өнімдерін сату көлемінің төмендеуі байқалады, ол науқастарды емдеуде жаңа альтернативті емдеу тәсілдерінің енгізілуіне байланысты.

Негізгі сөздер: Финляндия, донорлық, бағаналы жасушалар, қан препараттарын тестілеу, қаржыландыру.

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Tashtemirov K. K., Latvala E., Imangazinov S. B. Blood service in Finland. *Nauka i Zdravookhranenie* [Science & Healthcare]. 2016, 1, pp. 120-126.

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Issues concerning ensuring the medical institutions with products of donated blood remain current problem for Kazakhstan. There is a significant reduction in the number of donors. Consequently, this is the reason of lack of blood products in medical institutions. Further, there is an issue of lack of insufficient screening of donated blood for viral infections that lead to infection of patients. The above mentioned propose to improve the blood supply service by investigation of foreign experience.

The blood supply service in Russia, the nearest neighbor of Kazakhstan, is a single national system the activity of which is directed to meet the demands of medical institutions for preserved blood, its components and products. In 2009 there were 146 blood donor centers (BDC), 482 blood transfusion departments (BTD) and 100 hospitals which preserve blood in the Russian Federation. Compared to 2002 the number of BDC has reduced by a quarter and the number of BTD has halved [3].

In many countries such as France, Italy, Great Britain the blood supply service is highly centralized. It means planned development and organization of work under public control, adequate and transparent budget funding, single management hierarchy and quality standards. The main vector of the development of mass blood donation is the emphasis onvoluntary non-

remuneratedblooddonation. At the same time non-remuneratedblooddonation is not free of charge for the government. Thus, in Italy the government pays money to the nonprofit organization such as Association of voluntary Italian blood-donors (AVIS) which spend it on advocacy, formation of positive motivation of healthy people. In this case, the risk of hiding of possible contraindications by potential donors reduces which means the blood is less dangerous. For instance, in Russia measures are assumed to stimulate people donated blood for several times by means of conferring the state award [2]. It is known that according to the Council of Europe data it is necessary to have 40-60 donations per 1000 of the population to self-support the country with blood and its components. In Russia this indicator was 13 in 2008. To improve the donation system in Russia since 2008 the program has being implemented for the development of the blood supply service which includes three main directions, such as technical re-equipment of the blood supply service centers; processes informational support; development of mass voluntary donation [1]. In order to improve the activity of the blood supply service in Pavlodar region we have studied the activity of the blood supply service in Finland on-site which is a material for this paper.

Finland is a country located in the North of Europe. As at 2015 the population numbers about 5 479 800. The area of the country is 338 430,53км². It takes the one hundred and fourteenth place by the population and sixty-fourth by the area. The capital and the largest city is Helsinki [4]. Over the last few years the birth rates are lower than death rates. At the same time there is a population growth due to immigration. At the end of 2010 the gender composition was as follows: 49 % of men and 51 % of women [4]. Average life expectancy of Finnish women is 83,4 and 77,5 for Finnish men [5].

The activity of the blood supply service of the country is controlled by the Law on the blood supply service (197/2005) and Blood Service Decree (258/2006). The number of services provided by the blood supply service is controlled by the Finnish Medicines Agency Fimea under the Ministry of Social Affairs and Healthcare. There is internal screening of blood and blood products safety. In Finland the blood supply service is non-profit institution and operationally independent part of the Finnish Red Cross (FRC). For the periods between the General Meetings of the Finnish Red Cross (FRC) and Board Meetings, the blood supply service administered by the Finnish Red Cross Board which efficiently managed the blood supply service. The Finnish Red Cross Board is appointed by the Blood Supply Service Council. All the costs and development expenses are covered by selling the blood and blood products and expert services in the Finnish health care system.

The blood supply service is responsible for providing blood products throughout Finland centrally. Its objectives are to arrange the blood donation and collection as well as to screen donated blood, to prepare blood products and promote them among hospitals. Besides, the group and rhesus belonging of all Finnish pregnant women are identified there as well as Finnish register of stem cells for transplantation is maintained.

Staff. About 500 employees work at the blood supply service of the country. There is a reduction of average number of employees. Hence, in 2013 585 employees worked there 492 of which were full- time employees; in 2012 631 employees worked there 545 of which were full-time employees. As at December 31, 2012 there were 641 employees and in 2013 the number reduced to 537 employees. Most of them, i.e. 540 people, were full-time employees in 2012 and 470 people were full-time employees in 2013 that which indicates a slight increase in the proportion of full-time employees from 84,2% in 2012 to 87,5% in 2013 with decreasing the number of part-time employees from 62 to 42 and freelancers from 39 to 25 (Table 1).

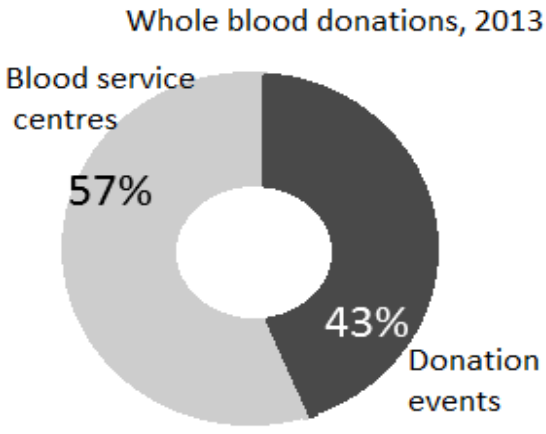
It should be noted that due to staff composition optimization 61 employees (12.3%) were fired out in 2013 8.1% of which were fired out of their own free will. High staff turnover is mainly related to retirement, child care leave and internal migration. At the average the employees worked there for 12.7 years. The average age of employees was 42. There were 88% of women and 12% of men.

Table 1.

Staff composition of the blood supply service in Finland.

Number of personnel	Year	
	2012	2013
Total number of personnel, 31 Dec.	641	537
Permanent	540	470
Temporary	62	42
On-call	39	25
Number of personnel, full-time equivalents (FTE)	545	492
Numberofpersonnel, average	631	585
Full-timeemployment, average	561	506

Blood donation. The blood supply service operates in 9 cities and is designed to provide hospitals with the donated blood and its products. At the end of 2013 8 blood service centers were closed and there were changed by mobile centers for blood collection. Due to modern and full informing of the population, necessary level of the preserved blood has been achieved. In the future, it seeks to increase the supply of blood collected during the visits and bring the level up to 50% of the entire collection across the country. Donation data for 2013 are presented at the picture 1 which illustrates that 57% of donations have been carried out in the central blood supply service and 43% of donations have been carried out by mobile teams.



Picture 1 - Number of donations for 2013.

The donated blood collection is carried out according to the weekly plan and distributed equally for each day of the week. New program software including automated procedures to create a stock of blood products such as platelets is being planned to be introduced to manage and regulate donor activity of the population.

Research activity. Research activities are carried out in the blood supply service to ensure the demands of hospitals in the qualitative blood and blood products for their transplantation, and at the same time they are constantly being improved.

To balance budget expenses and profits it was decided to stop the activity of the stem cells in the central blood services and establish the separate bone marrow bank located directly in the hospitals. At the same time the blood supple service is engaged in delivery of stem cells for patients in Finland and abroad. The number of transplants annually grows.

In 2013, the number of stem cells donors reached 1910, as the result total number of donors increased to 23000 people. The preparation of new cell products, in particular to treat burn patients, is being carried out. Besides, CHondroCelect has been introduced to treat patients with the cartilage damage which contains the patient's cells.

Financial risks of research activities were decreased due to patents selling and patent application to other companies which will continue commercialization of these innovations. The blood supply service participates in the research project for the laboratory processing of hematological biobank patterns. For the scientific achievements the blood supply service were awarded by money funds in the amount of € 595000.

The blood supply service participates in other research projects such as "Intelligent monitoring health and wellbeing" funded by TEKES line, "Intellectual biomarkers" association. The amount of biotransplants supplied for the period 2011-2013 is presented below (Table 2).

Table 2.

The amount of biotransplants in Finland for the period 2011-2013.

	Year		
	2011	2012	2013
From a Finnish donor to a Finnish patient			
Bone marrow graft	13	6	8
Blood stem cell graft	8	15	23
Cord bloodgraft	0	2	0
Lymphocytegraft	5	3	2
Total	26	26	23
From a non-Finnish donor to a Finnish patient			
Bonemarrowgraft	27	15	18
Bloodstemcellgraft	65	62	80
Cordbloodgraft	0	3	1
Lymphocytegraft	6	12	10
Total	98	93	109
From a Finnish donor to a non-Finnish patient			
Bonemarrowgraft	1	1	3
Bloodstemcellgraft	3	2	4
Cordbloodgraft	6	6	6
Lymphocytegraft	0	0	1
Total	10	9	14

It can be seen that there is a decrease of the total number biotransplants from 26 to 23 cases in Finland. However, there is a growth of the number of stem cells biotransplants from 8 in 2011 to 23 in 2013 and reduction the number of bone marrow biotransplants, cord blood and lymphocytes. There is a growth of biotransplants supply from 98 in 2011 to 109 in 2013 with a slight decrease in 2012, in particular 93.

The number of biotransplants supplied to Finland increased due to stem cells from 65 cases in 2011 to 80 in 2013, the lymphocytes - from 6 to 10 cases, respectively. Biotransplants supply amount from Finland increased slightly from 10 in 2011 to 14 in 2013 due to bone marrow and stem cells supply.

It should be noted that in 2013 the blood supply service published 55 scientific papers. Some of them were published in the journals with high impact factor.

Laboratory services.

In order to ensure the enough number of qualified employees in future and preserve the high level of examination and production, the laboratory services were integrated into the single legal entity. Laboratories are responsible for the quality of the blood product and fulfilling orders outside working hours and on weekends.

Some comparative indicators of laboratory services activity for the period 2012-2013 are shown below. There are no significant differences besides increasing the number of tissues and stem cells compatibility testing for further transplantation from 13110 cases in 2012 to 14600 in 2013, platelets testing - from 563 cases in 2012 to 580 cases in 2013, as well as the verification of the blood coagulation system - from 8379 cases to 8928, respectively (Table 3).

Infectious safety of donated blood indicates the existence of the risk of possible infection of recipients with transmissible infections. For this purpose the system of donor blood infectious safety quality control is constantly being improved. The donors testing results for infections transmitted by blood during donation are given in the Table 4.

Table 3.

Tests conducted in the blood supply service laboratories for medical institutions.

Blood Service laboratory tests for healthcare units	Year	
	2012	2013
Haemostasisexaminations	8379	8928
Blood group tests as a whole	15658	14736
Red blood cell antibody identification assays	4283	3738
Demanding red blood cell antibody identification assays	1615	1385
Blood compatibility tests performed urgently and outside office hours	2270	2283
Tests on maternity clinic specimens	80215	79511
Tissuecompatibilitytests	13110	14600
Platelettests	563	580

Table 4.

Donors with confirmed positive results in testing for transfusion infections.

Наименование инфекции	Year		
	2011	2012	2013
Hepatitis B	1	2	1
Hepatitis C	9	15	9
HOV	0	1	0
Syphilis	0	51	6

During 2011 and 2013 4 donors had the Hepatitis B, 33 donors had the Hepatitis C, 1 donor had HIV and 56 donors had syphilis. The sharp rise of transfusion infections was in 2012, when modern, more sensitive test systems have been introduced. Thus, 51 donors had syphilis and 15 had the Hepatitis C. No one of them was admitted to blood transfusion.

Financing

The blood supply service is a non-profit institution which applies its profit to cover all the expenses. Activities are funded by income earned from the hospitals for blood and other products. The blood supply service is not supported by the state funds or other external sources except some grant funding and subsidies for research projects.

In 2013 the turnover of the blood supply service was € 65 600000 that was 0,6% less than the year before. This decrease was mainly due to a decrease in sales of blood products € 1500000 less. This is due to introduction of new alternative methods of treatment. There was a growth of the laboratory services.

In the end of financial year, the blood supply service has deposits in the amount of € 14 000000 in the Finnish Red Cross bank (FRC). In 2013 the blood supply service had surplus in the amount of € 2 400000.

Conclusion:

The blood supply service in Finland is non-profit institution which is a part of the Finnish Red Cross (FRC) and performs orders of medical institutions for donated blood and biotransplants in the country.

The blood supply service in Finland carries out a scientific activity to ensure the stem cells transplants and some other blood products not only inside but also outside the country due to grant financing and subsidies for the research projects.

The blood supply service provides laboratory services to ensure infectious safety of donor blood and biotransplants.

There is a decrease in the amount of blood product sales due to the introduction of new alternative methods of patients treatment.

Under the leadership of Imangazinov S.B and Eila Latvala during the scientific research trip was analized the work of the Blood Service in Finland by Tashtemirov KK. The data was used in writing the article. There is no conflict of interests, there is no financing from the Ministry or any sponsor organizations.

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