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Perspective

National blood management system and the direction of government policy in Korea

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HISTORY OF THE NATIONAL BLOOD MANAGEMENT SYSTEM

1. The beginning of blood management

The blood management system in Korea was initiated in 1952 with the establishment of the first blood storage facilities in the navy during the Korean War (1950-1953). The National Blood Center was opened in 1954, and the services of the Korean Red Cross (KRC) Blood Center were commenced in 1958 after blood services were transferred from the National Blood Center to the KRC.

2. The period of policy introduction

Before policy introduction in the 1980s, blood collection and blood supply were mostly performed by private blood centers and hospitals. Blood collection from paid donors had gradually decreased until 1981 when it finally disappeared, and the selling of blood was declared illegal by law in 1999. The Blood Management Act was enacted in 1970, and the Act was reformed in 1981 to authorize the KRC with exclusive responsibility for the national blood service.

3. 1990s: Quantitative expansion of blood supply

During this period, Blood Donation Houses for blood collection were built at many places, and the number of such centers increased from 21 in 1994 to 93 in 1999. In addition, the infrastructure for blood service, including the Plasma Fractionation Center (1991) and the Blood Transfusion Research Center (1997) was established. As a result of these initiatives, Korea achieved a national blood donation rate of 5% in 1997, and the annual number of blood donations reached 2.5 million.

4. 2000s: Quality improvement of blood management

Blood-related accidents such as release of inappropriate blood from the KRC and transfusion-transmitted infections occurred in the early 2000s. These accidents reduced the people's trust in blood services, thereby resulting in great difficulties in performing these services. However, this crisis was used as an opportunity, and in 2004, the government and transfusion experts together formed a task force team for "Blood Safety Management Improvement." Further, the "Total Improvement Plan for Blood Safety Management" was implemented for 5 years. The KRC introduced blood donor registration in 2000 to secure safe and stable blood supply and initiated platelet component collection in 2001. The introduction of these systems has initiated a qualitative transition from group donation to individual donation and from whole-blood donation to blood-component donation.

5. Changes in the paradigm of blood management

As we take a look at the history of Korea's blood management, it can be seen that following changes in paradigm were made. Firstly, qualitative improvements for securing blood safety were achieved from quantitative growth for self-sufficient blood supply. Secondly, the focus of the blood donation system, which was centered on group donation, has changed to registered donors, thereby increasing the



safety of the donated blood. Thirdly, blood-supply management is gradually being strengthened to ensure stable supply and to prevent a blood-supply crisis, which had occurred in the past because of the lack of planning and control. Fourthly, in the past, blood centers were independently operated, but now they are being operated systematically and professionally under the leadership of the blood service management. Lastly, the change in blood services based on non-profit business to government-run blood services is changing the paradigm of blood management.

BLOOD SERVICE MANAGEMENT SYSTEM

Ministry of Health and Welfare (Division of Bioethics and Safety) controls overall blood management services, including the enactment and amendment of Blood Management Act, operation of the blood management committee, planning and enforcing blood supply and safety plans. Korea Center for Disease Control and Prevention (Division of Blood Safety Surveillance) performs surveillance of blood safety, inspection and evaluation of blood centers, investigation of certain transfusion-transmitted diseases, as well as research, education, and campaigns on blood safety. Korea Food and Drug Administration deals with manufacture and supply of plasma products for medical use.

The Blood Service Headquarter controls the overall blood services of the KRC, and the KRC operates 16 Blood Centers, 3 Blood Testing Centers, 112 Blood Donation Houses, 1 Blood Transfusion Research Center, and 1 Plasma Fractionation Center (Fig. 1). Hanmaeum Blood Center, which was established in 2002, has been receiving grants from the government since 2007 for creating good competition among blood service organizations.

CURRENT STATUS OF BLOOD SUPPLY AND SAFETY

1. Increase in the number of blood donors and the national blood donor percentage

The number of blood donations showed a decreasing trend for several years after the incidents of blood-related accidents in the early 2000s, but these numbers have slowly

recovered and have reached a new record of 2.57 million in 2009 (Fig. 2). In particular, the percentage of “non-group” donors increased from 45.6% in 2005 to 62.5% in 2009, which was a desirable trend.

2. Significant improvement in blood safety over the past 5 years

Blood safety management has shown a successful outcome since the implementation of the Total Improvement Plan for Blood Safety Management. This plan originally had 5 goals. The first goal was to ensure that safe blood was obtained from the first step of donor recruitment and blood collection. The second goal was to ensure safety by bringing in professionalism in the blood testing system, which was accomplished by establishing a multiple-verification and surveillance system, merger and acquisition of the Blood Testing Centers, and expansion of the infrastructure for blood safety, including test automation and data integration. The third goal was to establish a system for providing safe and appropriate transfusion management and blood supply. The fourth goal was to secure professionalism and independence of the KRC Blood Service Organization. Fur-

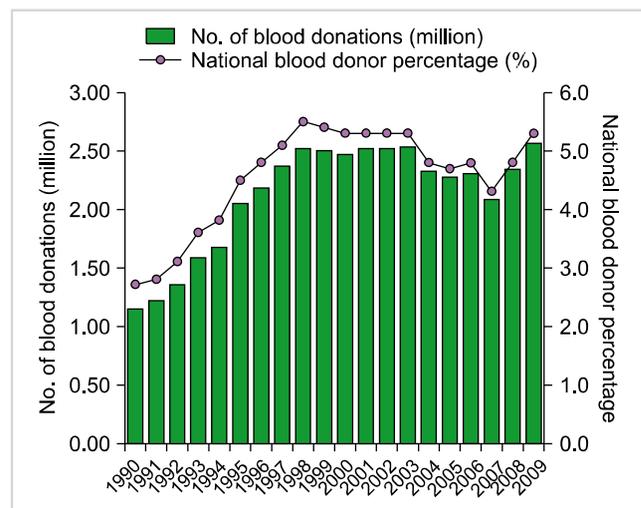


Fig. 2. Trends of blood donations and national blood donor percentage in Korea.

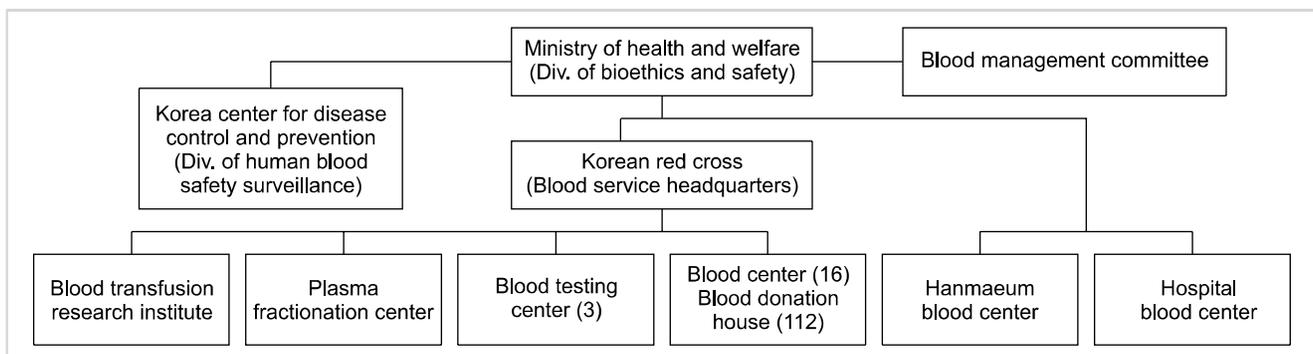


Fig. 1. Blood service management system in Korea.

Table 1. Number of transfusion-transmitted infections caused by HIV, HBV, and HCV.

	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09
HIV	0	0	4	2	0	0	0	0	0	0
HBV	2	6	0	1	0	0	0	0	0	0
HCV	4	6	4	0	1	0	0	0	0	0
Total	6	12	8	3	1	0	0	0	0	0

Abbreviations: HIV, human immunodeficiency virus; HBV, hepatitis B virus; HCV, hepatitis C virus.

ther, the last goal was to strengthen government surveillance of blood services and to increase financial support.

The management of blood safety from blood donation to transfusion has shown an improvement; significantly, no transfusion-transmitted infections caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV), or hepatitis C virus (HCV) have been detected since 2005 (Table 1).

NEW CHALLENGES

We need to pay attention to and respond to the challenges that we will encounter in the near future. First, because of the low birth rate and aging population, the demand for blood is likely to increase and the supply of blood is likely to decrease. To prepare for this upcoming problem, it is necessary to increase the number of registered donors to ensure a stable source of blood supply and to expand the donor group, which currently includes individuals in their twenties and certain demographic groups such as students and military personnel.

Second, emerging infectious agents such as influenza A (H1N1) virus may be harmful for blood safety. New donor blood-screening tests should be considered for such agents, and preemptive policies such as establishment of plans for a new epidemic alert system are required.

Third, the need to amend the Blood Management Act has arisen, and the act will have to be reviewed. The Blood Management Act was enacted in 1970, and it underwent a complete revision in 1999; however, the present time is suitable for new discussions for legal review and amendment of the Act with regard to issues of adding transfusion management etc.

CORE PROJECTS IN 2010

1. Project on blood supply and price policy

The core projects in terms of blood supply include diversification of donor population and promotion of blood donation. Currently, most of the donors are students, soldiers, and people under 30 years of age; however, diversification of this donor population is essential. Of the 2.35 million blood donations in 2008, 51% and 16% were by students and soldiers, respectively. The donors in the age group of 16-19 years, 20-29 years, and 30-39 years comprised 36%, 44%, and 13%, respectively, of the donor population. In terms of price policy, the price of blood had temporarily increased for 3 years since 2007. This increase in blood price led to the implementation of many projects, including the development of Blood Information Management System (BIMS), introduction of nucleic acid amplification test (NAT), and establishment of a blood center sample storage facility. Since the increase in blood price was temporary and was set to expire this year, readjustment of blood price should be currently under way.

2. Project on blood safety policy

The core objective of this project was to evaluate the results and effects of the "Total Improvement Plan for Blood Safety Management" and to determine the direction of policy to achieve a better system for the management of blood safety. In addition, the authorities are planning to establish government-managed transfusion services in medical facilities, which was not considered to be as important as the establishment of a system for the management of blood donation and manufacture of blood products. To this end, studies are expected to be performed to systematically set up government-managed transfusion services in medical facilities, including small- to medium-sized hospitals.

CONCLUSION

For the past 50 years, blood services in Korea have tremendously grown in terms of establishment of the policies, quantitative growth, and qualitative improvement. However, we are faced with new challenges and we have tasks to improve Blood Management Act and related policies, and to reconfigure the role of government. The most important goal of the blood services is to encourage voluntary blood donation and to provide safe and stable blood supply. To achieve this goal, the government will maintain close cooperation with related organizations and be receptive toward opinions and comments.