

Forum:

World Health Organization

Issue:

Mitigating the world blood supplies shortage

Student Officer:

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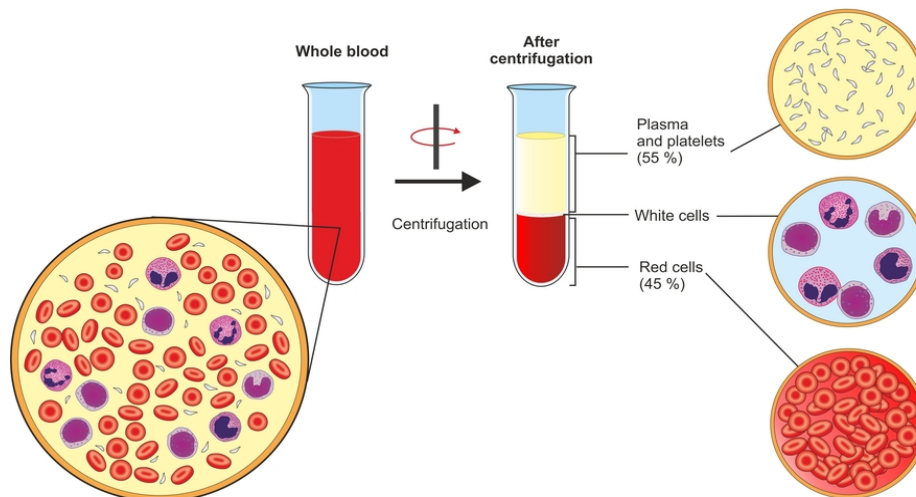
Overview

The first glance of transfusion originated with William Harvey's discovery of blood circulation in 1628. In 1665, the first recorded successful blood transfusion occurs in England: Physician Richard Lower keeps dogs alive by transfusion of blood from other dogs. In 1900, Karl Landsteiner, an Austrian physician, discovers the first three human blood groups, A, B, and C. Blood type C was later changed to O. His colleagues Alfred Decastello and Adriano Sturli add AB, the fourth type, in 1902. In 1970, blood banks move toward an all-volunteer blood donor system. Therefore, the application of blood transfusion has pushed the demand for blood products in human society. Currently, fresh blood product is not common during transfusion. Since the invention of the blood component therapy, the modern doctor is able to sense most patient's requirements of a specific element of blood, such as red cells or platelets. However, consider the blood product can address child mortality and maternal health; dramatically improve the life expectancy and quality of life of patients suffering from life-threatening inherited disorders, such as haemophilia, thalassaemia, and immune deficiency, and acquired conditions such as cancer and traumatic haemorrhage; and support complex medical and surgical procedures, including transplantation. Blood products are still precious and rare for most poor-sanction countries.

Basically, there are classified for certain blood components which are prepared in the medical center. For instance, red cells, platelets, fresh frozen plasma, and cryoprecipitate or other plasma derivatives manufactured from plasma. Ignore the differences among those blood products, the international world still facing severe blood shortage. The 40% of world blood production is collected in high-income countries which are 16% of earth's population. The severe distribution problem of blood also happens in blood donation. Based on a sample of 1000 people, the blood donation rate is 31.5 people in high-income countries, 15.9 people in upper-middle-income countries, 6.8 people in lower-middle-income countries, and only 5 people in low-income countries.

Inadequate blood supply or unsafe plans can affect the effectiveness of health services and care to appropriately serve patients with acute and terminal illnesses. Ensuring that all patients who need blood transfusion can obtain safe and effective treatment and quality-assured blood products is an important part of an effective health system and an important part of ensuring consumer safety.

In many countries, supply exceeds demand, and blood services around the world are facing the arduous challenge of providing sufficient blood products while ensuring the quality and safety of these products to deal with known and emerging threats to public health.



Key Terms

Blood products

These are classified as blood components prepared in the blood transfusion center (red cells, platelets, fresh frozen plasma and cryoprecipitate) or plasma derivatives manufactured from pooled plasma donations in plasma fractionation centers (such as albumin, coagulation factors and immunoglobulins). Plasma derivatives are covered by the Medicines Act and, like any other drug, must be prescribed by a licensed practitioner. Since 1999, as a vCJD risk-reduction measure, all plasma derivatives used in the UK are manufactured using donations from countries with an insignificant risk of vCJD.

Red blood cells

Red blood cells transport oxygen. Red cell transfusions are used for people with cancer and other blood diseases, people having surgery, people with anemia, people during childbirth, and trauma patients

Platelets

Platelets are important for blood clotting and tissue repair. A low platelet count is called thrombocytopenia.

Plasma

Plasma is the liquid component of blood and is mostly made of water. Plasma carries blood cells and other substances around our body.

Fresh Frozen Plasma (Clinical plasma)

Plasma is the liquid component of blood. Fresh frozen plasma is used to replace clotting factors and also by patients who need to quickly reverse the effects of blood thinning medications.

Cryoprecipitate

Cryoprecipitate is made from fresh frozen plasma. It contains proteins, including fibrinogen, involved in blood clotting. Cryoprecipitate is used in patient where they have a reduced level of fibrinogen, or where their fibrinogen is not working properly. This may include during a trauma, or massive bleeding.

Cryodepleted plasma

Cryodepleted plasma is made from fresh frozen plasma. It used most in plasma exchange for patients with thrombotic thrombocytopenic purpura (TTP).

Timelines/Important events

1628 William Harvey discovered the blood circulation

1665 the first recorded successful blood transfusion

1900 Karl Landsteiner, an Austrian physician, discovers the first three human blood groups, A, B, and C. Blood type C was later changed to O.

1902 Alfred Decastello and Adriano Sturli add AB, the fourth type

1908 Moreschi describes the antiglobulin reaction.

1914 Long-term anticoagulants, among them sodium citrate, are developed, allowing longer preservation of blood.

1932 The first blood bank is established in a Leningrad hospital.

1940 The United States government establishes a nationwide program for the collection of blood.

1953 The AABB Clearinghouse is established, providing a centralized system for exchanging blood among blood banks. Today, the Clearinghouse is called the National Blood Exchange.

1961 The role of platelet concentrates in reducing mortality from hemorrhage in cancer patients is recognized.

1970 blood banks move toward an all-volunteer blood donor system.

1981 First Acquired Immune Deficiency Syndrome (AIDS) case reported.

1989 Testing of donated blood for human-Tlymphotropic-virus-I-antibody (anti-HTLV-I) begins.

2002 West Nile virus identified as transfusion transmissible.

Major Nations/Organizations

International Committee of Red cross

Established in 1863, the ICRC operates worldwide, helping people affected by conflict and armed violence and promoting the laws that protect victims of war. An independent and neutral organization, its mandate stems essentially from the Geneva Conventions of 1949. They based in Geneva, Switzerland, and employ over 20,000 people in more than 100 countries.

United States of America

Currently, the American Red Cross is experiencing a severe blood shortage as the number of trauma cases, organ transplants and elective surgeries rise – and deplete the nation's blood inventory. Over the last three months, the Red Cross has distributed about 75,000 blood products more than expected to meet these needs, significantly decreasing the national blood supply. United States is the top importer of blood in the world; however, Uniter States had a considerable blood export market.

India

As per government records, India has more than 2,700 blood banks collecting about 10–11 million units of blood on an annual basis, but it is often in short supply. India's usage of plasma derivatives per capita is less than that of developed countries. Thus, India relies heavily on imports for plasma products, considered to be life-saving medicines. India currently only produces 2 plasma products; albumin and intravenous immunoglobulin, however, ten other plasma products are imported, resulting in a huge demand-supply gap in the country.

Switzerland

Switzerland had the biggest market share in the blood export trade in the world in 2016. Human or animal blood is one of the principals exported commodities in Switzerland right after gold and packaged medicaments. In 2016 the country exported blood worth \$26.2 billion to Germany, Belgium and the United States, which is a 44.75% increase since they exported blood worth \$18.1 billion in 2015. 18% of the blood from Switzerland was exported to the United States and 17% to Germany.

Nigeria

Due largely to challenges of poor policy formulation and implementation, lack of enabling legislative framework and funding difficulties, collection, distribution and use of safe blood for a healthier population has been a herculean task for government agencies and non-state actors in the line of such responsibilities in Nigeria.

Important Documents

WHO Experts' Consultation on Estimation of Blood Requirements <https://>

www.who.int/bloodsafety/transfusion_services/estimation_meeting-report.pdf?ua=1

Blood safety and availability in a scientific perspective. The article includes key facts and global statistic of blood product

<https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability>

Highlights of Transfusion Medicine History. The important time spot for human society developed transfusion skills.

<https://www.aabb.org/news-resources/resources/transfusion-medicine/highlights-of-transfusion-medicine-history>

Regional desk review of haemoglobinopathies with an emphasis on thalassaemia and accessibility and availability of safe blood and blood products as per these patients' requirement in South-East Asia under universal health coverage

<https://www.who.int/publications/i/item/9789290228516>

WHO Publishes new guidance to promote Strong, Efficient and Sustainable Regulatory Systems

<https://www.who.int/news/item/29-04-2021-who-publishes-new-guidance-to-promote-strong-efficient-and-sustainable-regulatory-systems>

Possible Solutions

1. Appropriately structured, well-coordinated and sustainably resourced national blood systems. Create standardized norm to keep, track, produce blood product, cooperate at the national level.
2. Appropriate national frameworks of regulatory controls, national standards, and quality assessment program.
3. Functioning and efficiently managed blood services in all countries. Develop a reserve plan and use a unified database to distribute blood products.
4. Effective implementation of patient blood management to optimize clinical practice of transfusion.
5. Effective surveillance, haemovigilance and pharmacovigilance, supported by comprehensive and accurate data collection systems. Real-time monitoring of possible blood-borne diseases and development of testing standards.
6. Partnerships, collaboration, and information exchange to achieve key priorities and jointly address challenges and emerging threats at global, regional and national levels.
7. Establishment of legal provisions for unpaid and commercial blood donations in low-income countries. Real-time monitoring of possible blood-borne diseases and development of testing standards.
8. Reduce the panic caused by Covid-19 epidemic to gain more opportunities to collect blood.
9. Recommends that all donors should be screened for infection before use.

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