Historical Perspective: Plasma Products in War and Peace

Dr. Ranjeet S. Ajmani
PlasmaGen Biosciences,
Bangalore
Plasma Products

- Albumin
- Immunoglobulin
- Factor VIII
- Factor IX
- von Willebrand Factor
- Pro-thrombin Complex
- Factor VII
- Fibrinogen
- Thrombin
- Fibrin Glue Kit
- Hepatitis Immunoglobulin
- Rabies Immunoglobulin
- Tetanus Immunoglobulin
- Anti-D Immunoglobulin
- Antithrombin III
- Alpha-1 antitrypsin
- C-1 Esterase Inhibitor
- Factor XIII
- Factor XI
Historical View
Historical View

Cohn’s Laboratory shipped human serum Albumin to treat casualties of the Pearl Harbor attack Dec 7, 1941.
Historical View

By 2030, India & China will have bulk of Cancer cases globally

But are so likely to be ill-prepared to deal with it as:

- Ageing of the population
- Increase in cancer cases at much rapid pace as compared to developing world
Preparedness ????

Uttrakhand
Consumption of Plasma Products – Global Distribution

Population Vs Consumption

<table>
<thead>
<tr>
<th>Region</th>
<th>% of Population</th>
<th>% Consumption of Plasma Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia &amp; Pacific</td>
<td>15.3</td>
<td>58.1</td>
</tr>
<tr>
<td>Middle East &amp; Africa</td>
<td>3.5</td>
<td>17.4</td>
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<tr>
<td>Europe</td>
<td>10.8</td>
<td>36.2</td>
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<tr>
<td>South America</td>
<td>5.7</td>
<td>8.7</td>
</tr>
<tr>
<td>North America</td>
<td>5.0</td>
<td>36.7</td>
</tr>
</tbody>
</table>

The Marketing Research Bureau, Inc. (MRB), USA.
Vulnerability

Are we ready 100 % ?

Can one be ready for anything and everything ?
VIAL 023
A Father's Pursuit for Justice
memoir

Gary William Cross
How Plasma Collection Capacity Affects Global Self-Sufficiency Index

Global Average

Excluding US, Austria, Germany, Czech Republic, and China

Excluding US

IVIG

Albumin

Factor VIII

57

63

113

48
Power of Politics

Import of Factor VIII

Hemophilia Care
Russia : Fundamental right

"I am what I am. I am what I am."
Everyday Life: War

**Hemophilia:**

1989: Tragedy
1992: No Factor VIII
Rate of Diagnosis: Only 15-18%
Only 7%: 4th decade of life
Huge social burden

**Primary-Immuno Deficiency**

Rate of Diagnosis: Less than 1%
Cost of treatment
No public healthcare support
Bangalore faces acute shortage of blood

Sunitha Rao R | TNN

Bangalore: Nayan, 6, is shuttling between hospitals in Bangalore. The thalassemia patient from Shimoga awaits A+ blood for the transfusion she has to undergo once a month. Her elder sister Aishwarya has been luckier. A thalassemia patient too, she had to wait for just a day.

“Aishwarya got O+ blood. But I have been waiting for Nayan’s blood transfusion since Wednesday,” says a worried Shivaraj Janaragwadi, the girl’s father. A driver from Shimoga, Shivaraj visits Bangalore every month for his daughter’s treatment. “This is for the first time in 24 years that we have faced this problem,” he says. Nayan is among 400 thalassemia patients bearing the brunt of acute blood shortage in the city. Thalassemia affects the body’s ability to produce haemoglobin and red blood cells. Thalassemia day care centres at Indira Gandhi Institute of Child Health (IGICH) and Rashtrouthana Blood Bank cater to transfusion needs of the patients in the city.

“It’s an emergency,” says Rajath Agarwal, senior volunteer of Sankalp India foundation, a statewide blood bank network. Though a common problem during December-January holiday season, it is acute this time. The city’s daily blood requirement is 700 units and the shortage is 200 units. “Last year the shortage was about 50-100 units and we somehow managed,” said a source.

“During September and October, unused excess blood units collected were sent to rural areas. But this month we are facing acute shortage even for common blood groups like B+ and A+, not to mention the rare AB+ and AB- groups,” said Dr Sumithra P, medical officer, Rashtrouthana Blood Bank. Holidays for corporate employees and exams for college students are seen as reasons for the shortage. Dr Vishwanath Veeranna, professor of pathology, in-charge of transfusion medicine, IGICH, says, “Voluntary donation drives during national festivals bring us a lot of blood. Such drives must happen more frequently to avoid this situation.”

Thalassemia patients need fresh blood once a month. The shortage began a week ago. It has affected surgeries, but in such cases we can use stored blood, even 30 days old,” he explains.

Alcohol intake among youths during New Year revelry has also affected donation drives. “We are wary of donation this season because of binge drinking,” Dr Vishwanath admits.

However, private hospitals haven’t been affected. Dr C Shrivaram, chief of Transfusion and Blood Bank, Manipal Hospital, says blood banks have to foresee such situations. “But the situation might worsen if the city doesn’t work on voluntary blood donations,” he adds.

Similar scene in other cities:
Bangalore’s problem is not unique. December is a lull period for blood banks in other cities too. “No blood donation drives take place between December 20 and January first week, affecting many patients in need of blood,” says N Subhakar, president of Rotary East, Chennai. In emergency cases, ambulance drivers have donated blood in the TN capital. After facing an acute blood shortage five years ago, Mumbai blood banks are ensuring sufficient stocks.

Bangalorians interested in donating blood can reach Sankalp India foundation on 9480044444.

(Graphics: MR Rajeshkumar)

(Times View)
A Baramati-based 42-year-old patient is presently admitted in Poona Hospital, suffering from Viral Hepatitis E. The family has been on the hunt for the drug for 10 days — it was finally procured on Thursday, from a network of well-wishers and chemists.

Liver and kidney operations in the city have been affected due to the paucity of the drug. Specialists say the situation is getting just as grim across the country.

Hemant Nalade (name changed), a 42-year-old Baramati businessman, was admitted to Poona Hospital and Research Centre on Wednesday. “………….”

Liver and kidney operations in the city have been affected due to the paucity of the drug. Specialists say the situation is getting just as grim across the country.

Hemant Nalade, a 42-year-old businessman, was admitted to Poona Hospital and Research Centre on Wednesday. He is in search of albumin human albumin serum. After a lot of struggle, his brother managed to procure it. “Fortunately, my brother could tap into a network of chemists; this is something that had to be done urgently, as my doctor had warned,” he told Mirror, lying on the ICU bed.

Liver and kidney operations in the city have been affected due to the paucity of the drug. Specialists say the situation is getting just as grim across the country.
DCGI allows import of plasma to tide over human albumin shortage

Shardul Nautiyal, Mumbai
Monday, November 07, 2016, 08:00 Hrs [IST]
Manufacturers of human albumin are likely to import plasma— a vital blood component to manufacture human albumin, from countries like Vietnam and Sri Lanka to address the shortage of the life-saving human albumin. This is following the Drug Controller General of India (DCGI) approval for import of plasma in view of the shortage.

Human albumin is derived from plasma through a fractionation process. Human albumin serum is a protein in human plasma of the blood which is produced in liver. It maintains levels of calcium in the body and transports nutrients or drugs effectively in the bloodstream. The body can suffer a shortage of albumin if a patient is affected by liver disease, kidney failure, burns, malnutrition etc.

Meanwhile, the Union health ministry has also now permitted blood banks having component separation facility to exchange their surplus plasma with indigenous fractionators in the country based on a uniform exchange value of Rs.1,600 per litre of plasma.

Demand for plasma currently stands at over 70,000 vials per month in the country, according to official sources. The manufacturers, however, are able to produce only half of the current demand.

The health ministry’s approval is a welcome change to help blood banks provide surplus plasma to indigenous fractionators in the country under the conditions that the fractionators must undertake to fulfill needs of Indian market first. None of the products recovered from the Indian plasma should be exported before fulfilling domestic demand.

According to a senior official, prices of plasma have increased globally because of its increased requirement and therefore it also has a bearing on the cost of life saving human albumin. The current shortage of human albumin in the country can also be attributed to the limited number of plasma fractionation centres in the country, major ones being Navi Mumbai based Reliance Life Sciences and Ahmedabad based Intas Pharmaceuticals.

The technology to produce albumin is capital intensive. A fractionation unit costs worth Rs.500 to Rs.600 crore to process 6 lakh litres or even more of plasma to produce the vital human albumin.

Maharashtra Food and Drugs Administration (FDA) has also sent a directive to the blood banks in the state to help manufacturers procure unutilised plasma from the blood banks to address the shortage. There are 309 blood banks across the state of Maharashtra.
Technology has changed every aspect of our lives.

Huge impact on Healthcare system and Social Life.
Technology : Societal Needs

- Technology as a value then a tool
- Social impact - change in the quality of life
- Financial view : 1941 to 2014 : 20 Billion Vs patient care view