
UNIT 2 TRANSMISSION OF HIV THROUGH BLOOD

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2.0 OBJECTIVES

The aim of this unit is to create awareness and knowledge about the transmission of HIV through blood and blood products. This unit will provide information regarding various modes of transmission of HIV through blood. We will also discuss about various groups of population that are vulnerable from HIV transmission through blood. At the end of the unit some issues like blood donation, blood testing, information on blood banks etc. that has a direct relationship with HIV transmission will be discussed in detail.

After reading this unit you will be able to:

- know various modes of HIV transmission through blood;
- state various vulnerable groups of population for HIV transmission through blood;
- analyze the relationship between modes of transmission and vulnerable groups of population;
- understand various preventive measures to be adopted to checks the transmission of HIV through blood; and
- understand legal issues involved in blood donation and blood bank operations in India.

2.1 INTRODUCTION

In the previous unit we have already studied transmission of HIV through sex. In this unit we shall study transmission of HIV through blood. The magnitude of transmission through blood is very less when compared to transmission through

sex. The important aspect about transmission through blood is that this can be completely eliminated if certain precautions are followed. All these issues will be discussed in this unit.

2.2 TRANSMISSION OF HIV THROUGH BLOOD

HIV reproduces itself in the CD4 lymphocytes, which circulate in the blood and other body fluids. Blood collected for transfusion contains these lymphocytes. HIV is not only present within these cells but it is also present in serum (blood unassociated with cells). Thus, introduction of blood from infected person to uninfected person will transfer the virus that is present both in the cells as well as the serum. Of all the forms of exposure to HIV, **blood transfusion** is the most effective means of transmitting the virus from person to person. No barrier of any kind exists between the infected person and the individual who receives contaminated blood directly into the blood stream.

Instruments like scalpels or suture needles, if contaminated with infected blood can transmit the infection. Similarly needles that have blood stains on them can transmit the infection. Sometimes injuries that occur with broken glass vials containing infected blood or serum can transmit the infection. The risk of infection through small cuts and abrasions that occur with contact sports e.g. wrestling, football etc. is very low.

Transmission of HIV through Blood Products

Blood that is collected from a donor can be separated into different components using a cell separator. One unit of blood will be separated into red blood cells, platelet concentrates and plasma. These components can be used as and when required.

Apart from these conventional uses, substances present in the blood i.e. antibodies are removed to produce **immunoglobulin**. These immunoglobulins are used in treatment of many medical conditions. HIV can be transmitted through these products also. Treating these products can prevent transmission.

Various Means of Transmission

A) HIV transmission through intravenous drug use (IVDU)

Intravenous drug use acts as a source of transmission of HIV because drug users frequently share syringes and needles to inject drugs. These instruments are not sterilised before use. Small volumes of contaminated blood remains inside previously used needles and syringes thereby providing opportunities to transmit the virus via their blood contents. In the early years of the epidemic, studies found links between HIV drug users and male homosexuals who were already infected with HIV. The overlap of these two groups facilitated in the introduction of HIV into drug using population and then to the sex partners of the drug users. Rapid increase in prevalence of HIV in drug users in major urban areas from around the world were recorded in the late 1980s and early nineties.

B) Transmission through organ transplantation

HIV can be transmitted through infected organs. HIV is found in the blood as well as the tissue of an infected organ. Before any organ is transplanted the donor has to be screened for HIV. In cadaver (removal of organs from brain dead patients) transplantation, the donor has to be checked. This route of transmission is very rare in practice. Since an infected person's body fluids contain HIV it is essential that screening for HIV is carried in cases of organ transplantation of any kind such as kidney, bone marrow, eyes, skin, semen etc.

Check Your Progress I

Note: Use the space provided for your answers.

1) How HIV is transmitted through blood and blood products?

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2.3 VULNERABLE POPULATION

A) Patients Suffering from Blood Disorders

Patients who suffer from various blood disorders like various types of anemia, especially Thalassemia or Leukemia require multiple transfusions. We have already discussed about bleeding disorders like Hemophilia. Patients may need multiple transfusions. They are at risk to contract the infection if untested blood is used. Measures that can reduce the need for transfusion in these patients can prevent the infection from spreading.

B) Hemophilia

Hemophiliacs are born with an inherited bleeding disorder and are exclusively males. This disorder is determined genetically. It results in poor clotting of blood. There is an absence of a single protein that is involved in coagulation. Various forms of hemophilia exist. Hemophilia is due to deficiency of Factor VIII. It is the most common form of Hemophilia. Hemophilia B is due to deficiency of factor IX. Before the onset of universal screening of blood products HIV infection was common among hemophiliac patients. After the onset of screening new infections among hemophiliacs has decreased.

C) Intravenous Drug Users

Injecting drug users are potential channel for transmission of HIV. We have already discussed this mode of transmission. In India, injecting drug users have a high incidence of the infection. It is more common in the North Eastern parts of India as well as states bordering some of the neighbouring countries. The drug addicts often sell their blood to purchase drugs. Several of them are found to be professional blood donors.

D) Professional Blood Donors

Professional blood donors are persons who repeatedly donate blood to the blood banks for money. They are usually poor and unhealthy people. Many of them are found to be HIV carriers. Professional blood donors should be avoided at all costs. The Supreme Court of India has banned professional blood donation in the country. However, these professionals continue their profession, as there is dearth of blood donation in the country. We shall discuss more in detail about Blood Donation and Blood Banks later in this chapter. Professional Blood Donors pose a high risk for HIV transmission.

E) Health Care Workers

Health care workers often get injuries due to needle prick and cuts with other equipment. There are several documented cases of health care workers being infected through this route. The health care providers must be aware of the universal precautions and put them into practice.

F) Miscellaneous

There are certain practices through which the HIV can be transmitted through blood due to infected instruments. There are:

1) Circumcision or Genital Mutilation

Practices of circumcision or genital mutilations are found among some groups of people in India. A circumcision needs to be done with extra care. Using clean instruments and if a trained person does the operation the chances of the infection can be reduced. Care needs to be taken to ensure that same instrument is not used on more than one person or proper sterilization is required for each case.

2) Tattooing, Ear or Nose Piercing

Tattooing, ear or nose piercing is an age-old custom in India. Nose and ear piercing is very common in India. Tattooing is more common among the tribal communities. It can be seen in cities also. These procedures should be done with clean instruments. Village communities must be educated about the risks involved in such practices when the act is performed on a group of people.

3) Organ Transplantations

Patients who receive organ from donors are at a risk of getting infected. There is always a need for verifying the status of a donor before accepting any type of organ from a donor.

Check Your Progress II

Note: Use the space provided for your answers.

1) Write a brief note on professional blood donors.

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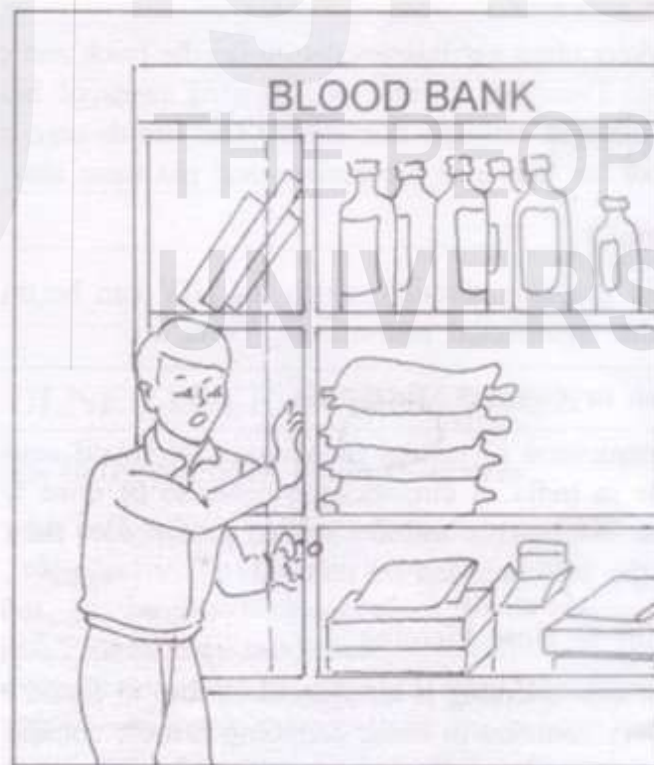
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2.4 ISSUES RELATED TO TRANSMISSION OF HIV THROUGH BLOOD

A) Blood Donations and Blood Banks in India

Blood donations and blood banks were started in India since 1941. During this period, the Second World War was in full swing. It became necessary to supply blood to the wounded soldiers and civilians.



Today, there are over a thousand registered blood banks all over the country. There are also several thousand illegal and unregistered blood banks in the country. A person can donate blood once in three to four months. In India demand for blood out weighs the supply hence, blood from professional donors are also encouraged by the blood banks. The Supreme Court has banned this practice since 1996.

B) Testing Blood

Testing of blood for HIV has been made mandatory in most of the countries. There is a law in India that makes it mandatory to test all the blood that is used for transfusion.



C) Voluntary Blood Donation

Voluntary blood donation should be encouraged. Volunteers are likely to be healthier and may not have high-risk behaviour that is associated with professional blood donors. The blood from a voluntary donor is likely to be of good quality.

D) Rational Use of Blood

Blood should be used carefully. It should be used only when it is essential. Minimum amount that is needed should be used.

E) Sterilization of Instruments

Equipments used for collection and for transfusion of blood should be properly sterilize. Health care providers need to be aware of such procedures.

Check Your Progress III

Note: Use the space provided for your answers.

1) Describe any three issues related to transmission of HIV through Blood?

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2.5 INFORMATION ON BLOOD BANKS

“Blood is an essential component of the body which provides sustenance to life. There can be no greater service to the humanity than to offer one’s blood to save the life of other fellow human beings. At the same time blood, instead of saving life, can also lead to death of the person to whom the blood is given if the blood is contaminated. As a result of developments in medical science it is possible to preserve and store blood after it has been collected so that it can be available in case of need. There are blood banks which undertake the task of collecting, testing and storing the whole blood and its components and make the same available when needed. In view of dangers inherent in supply of contaminated blood it must be ensured that the blood that is available with the blood banks for use is healthy and free from infection.”

This is the opening para of the Supreme Court judgment in *Common Cause Vs. Union of India & Others* (JT 1996 (1) S.C. 38) delivered by Justice S.C. Agrawal. This Writ Petition (Civil) No. 91 of 1992 under Article 32 of the Constitution of India was heard by Hon’ble Justice Sh. S.C. Agrawal and Hon’ble Justice Sh. G.B. Patnaik and the judgment was delivered on 4-1-1996. The Writ Petition was filed by Sh. H.D. Shourie on behalf of **Common Cause**, a registered Society that takes up interest litigation earnestly.

Focus Petition

The petitioners had highlighted the serious deficiencies and shortcomings in the matter of collection, storage and supply of blood through the various blood centers operating in the country. It was prayed by the petitioners to issue appropriate writs or directions to the Union of India, States and the Union Territories to ensure proper positive and concrete steps for obviating the malpractices, malfunctioning and other inadequacies of the blood banks all over the country. The union of India, the states and the Union Territories were made Respondents to the Writ Petition. The petitioners had prayed that the respondents should initiate a time bound programme and place before the Court a specific programme of action to remedy the deficiencies in the operation of the blood banks.

Blood is treated as a drug under the Drugs and Cosmetics Act, 1940, for the purpose of regulating its collection, storage and supply. In the Drugs and Cosmetics Rules, 1945, made under the 1940 Act, provisions are made for equipment and supplies required for a blood bank in Part XII-B. These provisions were inserted vide notification on 24-6-1967. In this part requirements regarding equipment, blood collection supplies, canter equipment and emergency equipment for blood donor room as well as provisions for laboratory, general supplies, technical staff, accommodation for blood bank, label for whole blood and colour scheme for lable etc. were also made.

2.6 The Ferguson Study

In 1990 the Government of India had entrusted M/s AF Ferguson and Co., Management Consultancy Firm, with the study of blood banking system in the country.

The scope of the study was to:

- assess the status of Government, private commercial and voluntary blood banks;
- recommend policy and procedural changes; and
- prepare a scheme for modernisation

Status of Blood Banks

M/s AF Ferguson & Co. submitted its report to the Government in July 1990. According to this report out of the total number of 1018 blood banks in the country, 203 were commercial blood banks and the rest were controlled by then central Government, the state Governments, Private Hospital and Voluntary Organisations. The volume of blood collected by the commercial blood banks was 4.7 lakhs units out of the total of 19.5 lakhs units by all blood banks. It was also reported that commercial blood banks were collecting blood mostly from professional donors while the other blood banks were collecting blood mostly from the relatives of the patients or from voluntary donors.

Deficiencies

The Ferguson Report highlights various deficiencies. It was stated that:

- i) Out of the total number of 1018 blood banks as many as 616 are reported to be unlicensed. There are only 201 licensed commercial blood banks; the supply of blood by licensed commercial blood banks is only about $\frac{1}{4}$ of the blood in the hospitals of the country.
- ii) No medical check up is done on the blood donors (sellers); their health status is not examined. The blood trade flourishes with poor people like unemployed, rickshaw pullers, and drug addicts selling their blood. Such blood sellers suffer from various infections and their haemoglobin is lower than the prescribed level. It has been reported that there are many persons who donate blood 5/6 times in a month; poverty makes them to do so at first but later it is reported to become like an addiction, the blood seller enjoying the dizziness due to the reduced supply.
- iii) It is a mandatory requirement to conduct tests on blood which is to be administered to a patient or to be issued to hospitals for transfusion. The blood so issued has to be free from **HIV (AIDS)**, viral hepatitis, malaria, venereal diseases etc. It is reported that mandatory tests which are required to be done are rarely conducted. Most of the AIDS surveillance centers are not functioning efficiently and up to 85 per cent of blood collected in the country is not screened for HIV/AIDS. Under an action plan to screen blood for AIDS 37 blood testing centers were to be set up in 29 cities, but only 11 testing centers were functioning by July 1990, and training of technicians for these centers was lagging.
- iv) The blood banks presently thrive on bleeding 4000 to 5000 regular professional donors in 18-20 cities. The professional donors which include many women are reported to be victims of ill health, low hemoglobin levels and many infections, are bled at frequent intervals by the commercial blood banks.

- v) Storage facilities in the blood banks are far from satisfactory. The blood banks have necessarily to possess facilities like refrigerators exclusively for storage of blood with a specified range of temperature for ensuring safety of blood. In the existing blood banks many items of equipment remain unattended for years, electricity failures are frequent, and generators are a rarity. This applies to not only to commercial blood banks but even to some of the Government hospitals. Many items of the basic equipment required for blood banks are not available and a good part of them do not have even adequate storage facilities.
- vi) Many of the blood banks are located in unhygienic environment and they collect and store blood in very unhygienic conditions.
- vii) In some places strong middlemen operate for the blood banks by arranging for donors. The middlemen dictate the charges to be paid and take heavy commission; the selection of donors disregards the level of health etc.

A large number of the professional donors are alcoholics or drug abusers, have indiscriminate sexual habits and are a high risk group for Hepatitis B and HIV/AIDS and are unfit to donate blood.

Trained professional are generally not available in the blood banks. Most of the blood banks lack trained post-graduates at the helm; they have no donor organisers to bring voluntary donors; and many of them are manned by technical staff who do not have requisite qualifications of a Diploma in Medical Laboratory Technology. At present (2004) there are only few courses that provide post-graduate specialization in the field of blood donation and transfusion as in developed countries. The Drug Control departments, which are expected to ensure the appropriate functioning of the blood banks, do not themselves have specified and trained personnel.

In the storage of blood the basic and essential requirements of clean environments, etc. are ignored. Nexus is reported to be existing between the attending doctor of the patient and the commercial blood bank, with the former directing the patients to the latter, and the latter giving a percentage of the sale to the former.

Check Your Progress IV

Note: Use the space provided for your answers.

- 1) According to the Ferguson study what was the status of blood bank in the country at that time?

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2.7 DIRECTION OF SUPREME COURT TO THE GOVERNMENT

Keeping in view of the report of the committee that was constituted by the Court and the report of the Committee of Experts set up by the Indian Red Cross Society and the programme that is being implemented by the NACO as well as the submissions of the learned counsel, the Court was of the view that suitable action should be taken by the Union Government as well as the Governments of the States and the Union Territories' Administration in accordance with the plan for immediate implementation as well as the plan for long-term implementation suggested by the Committee constituted by the Court.

Certain important directions as given by the Hon'ble Supreme Court or the outcome of the public interest litigation can be summarized as follows:

- 1) The Government has to establish a National Council of Blood Transfusion as a registered society, having a wide representation from the Directorate General of Health Services, Drug Controller of India, Ministry of Finance, Indian Red Cross Society, private blood banks including Indian Association of Blood Banks, major medical and health institutions and NGOs active in the field of securing voluntary blood donations. Basic funds for the functioning of the Council shall be provided by the Government of India. The Council was also empowered to raise funds on its own.
- 2) The State Government and the Union Territories were to establish State Councils, to be registered as societies, with wide representation as in the National Council. Funds to be provided by the State/UT Governments with the right to raise its own funds.
- 3) Programmes and activities of Councils to cover entire range of services related to operation and requirements of blood donations:
 - i) launching of effective motivation campaigns through utilization of all media for stimulating voluntary blood donations;
 - ii) launching programmes of blood donation in educational institutions; among the labour, industry and trade;
 - iii) establishments and organisations of various services including civic bodies;
 - iv) training of personnel in relation to all operations of blood collection, storage and utilization and separation of blood groups and proper labeling;
 - v) proper storage and transport;
 - vi) quality control and archiving system;
 - vii) cross matching of blood between donors and recipients;
 - viii) separation and storage of components of blood; and
 - ix) all the basic essentials of the blood banking.
- 4) The Council was to undertake training programmes for technical Personnel in related fields.

- 5) The Council was to establish an Institution for conducting research in collection, processing, storage, distribution of blood and its components and manufacture of the blood products and other allied fields.
- 6) The Council was to take steps to start special Post-Graduate courses in the above fields in various medical college /institutions
- 7) To facilitate collection of funds the Govt. of India was to grant 100 per cent exemption from income tax to the donations made to the Councils.
- 8) To ensure licensing of all blood banks which are eligible, within one year and close the operations of unlicensed banks.
- 9) To ensure the elimination of professional donors within a period of two years.
- 10) To enforce the provisions of the Drugs and Cosmetic Act & Rules.
- 11) To ensure that the Drug Inspectors are duly trained in blood banking operations and posted in adequate numbers to ensure periodic checks through the country.
- 12) To consider the advisability of enacting a separate legislation for regulating the blood banking system. This judgment was delivered in January, 1996.



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2.8 LET US SUM UP

In this unit, we started our discussion by describing the transmission of **HIV** through blood.

HIV reproduces in CD, which circulates in the blood and other body fluids. Blood collected for transfusion contains these lymphocytes. HIV is not only present in the cell it is also present in the serum. Thus, introducing of blood and blood products from an infected person will transmit the infection to an uninfected person. Of all forms of transmission of HIV, blood transfusion is the most efficient one.

HIV transmission occurs through blood generally when the blood is transfused, through Intravenous drug abuse, dialysis and organ transplant. There are various issues involved in the transmission of HIV through blood. These issues are also discussed in this unit.

HIV transmission through blood can be prevented at two levels. One is the personal aspect like reducing high risk behaviour like use of fresh needles. The other is the control exercised by the Government on the blood banks.

2.9 SUGGESTED READINGS

Frumkin, Lyn and Leonard John (1994), *Questions and answers on AIDS*, PMIC Los Angeles.

Thomas, Gracious (1997), *Prevention of AIDS: In search of Answers*, Shipra Publications, New Delhi.

Thomas, Sinha et. Al (1997), *AIDS, Social Work and Law*, Rawat Publications, New Delhi.

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