

ACQUIRED IMMUNO DEFICIENCY SYNDROME (AIDS): AN OVERVIEW

AND PROCEDURES FOR PREVENTION IN HEALTH WORKERS

Preamble:

Human race has been subjected to several diseases since time immemorial. Some diseases appeared in epidemics, some in epidemic proportions and some others in isolated individuals. Epidemic diseases have been caused by bacteriae and viruses and parasites. Small pox, plague, cholera and jaundice, malaria and filariasis are some examples of epidemic diseases. These diseases spread from man to man through air, water contaminated by disease producing organisms or intermediary agents like tics and mosquitoes.

With the advent of modern science and scientific procedures, small pox has been eradicated from the globe. Other epidemic diseases have been made to disappear from the western world due to improved standards of living and hygienic environment. These diseases are fast disappearing in the developing countries. Epidemic diseases like measles, whooping cough, diphtheria and similar diseases would be eliminated in the near future. Mankind was happy with its success in eliminating these communicable diseases because these epidemics killed hundreds and thousands of people in a few days and weeks.

However, in recent years a new disease caused by virus has appeared and the disease is spreading very fast across the length and breadth of the world. This disease is called Acquired Immunodeficiency Syndrome or in short AIDS and seems to engulf the entire mankind if left unchecked.

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AIDS is a sickness caused by a virus known as Human Immuno-Deficiency Virus (HIV). When it gets into the blood, the body's defences can have trouble to fight other diseases. AIDS stands for Acquired (not born with) Immune (body's defence mechanism) Deficiency (not properly working) Syndrome (group of signs and symptoms). AIDS is a serious form of disease. The causative organisms breaks down the body's immune system leaving it vulnerable to infections and cancers.

History of AIDS:

The history of AIDS is very short. .. The problem was first noticed in United States of America in 1978. By 1981 sufficient cases were collected to identify the problem as a new disease process. The number of such cases increased rapidly and were concentrated in areas of populations with risk groups. The causative organism was unclear but followed the risk pattern of hepatitis B—a virus organism responsible for epidemic of jaundice-recipients of blood transfusion.

How Widespread is AIDS?

AIDS was first reported from New York in 1981. Since then AIDS has been diagnosed in all 50 States in the United States and almost all countries with the capacity and interest to look for it. By 1989, a total of 141,894 cases of AIDS were reported from 145 countries of the world. Approximately 0.4 per cent of the population in United States are positive for AIDS test. For every reported case of AIDS there is likely to be one of AIDS related complex (ARC) and 50 to 100 virus infected persons.

The spread and development of AIDS is a matter of great concern. It must be recognised that the epidemic is seriously underestimated. It affects both developed and developing countries and the epidemic will evolve over decades with its incalculable damage if unchecked

HIV Infection:

Once a person is infected, the individual harbours viable virus that is potentially transmissible for the duration of life. Some of the infected individuals remain without any symptoms, some develop findings that reflect infection but the remaining develop AIDS diseases. Once infected

the blood becomes positive for AIDS test at three months. Currently available information suggests that about 30 per cent of all HIV infected patients will develop AIDS within six to seven years. The destiny of other 70 per cent is somewhat unclear but it is conceivable that nearly all will eventually develop AIDS. The HIV infection is somewhat unique compared with other infections. Once infected he or she remains so for the rest of his or her life. A majority of patients who harbour the virus do not know it. Unlike previous epidemics of infectious diseases there is no apparent immune response.

HIV Virus :

HIV virus causing AIDS was discovered in January 1983. AIDS is a new disease and HIV probably originated in animals. HIV virus is relatively fragile and is destroyed by most common disinfectants. Instruments that break the skin like needles, scalpel, etc., must be thoroughly disinfected before use.

How Does One Get Infected ?

AIDS is primarily a sexually transmitted disease (STD) but the virus can spread by other routes also. A single exposure can result in HIV infection. HIV is not transmitted by casual contacts with AIDS patients. Family members other than sexual partners of AIDS victims are very unlikely to develop AIDS. AIDS is not contaminated by sharing plates, cups, cutlery and the like. Spread of disease through intimate kissing cannot be completely ruled out but such cases are rare. There is no evidence that mosquitoes transmit the disease. Ambulance drivers, police and fireman who offered emergency assistance to AIDS patients have not fallen ill but they need to use sensible precautions.

Risk to Health Professionals :

Health care workers are at the risk of HIV infection in the workplace. This risk has created understandable unrest in the profession. There are three types of exposures. Unusual exposures in terms of injury and the inoculum of blood. The traditional needle stick injury and exposures of uncovered surfaces of skin that are cut or infected. In all these cases, the exposure was either unanticipated or that universal precautions should have been ineffective in all cases.

Source of Human Virus :

Blood, semen and vaginal secretions are the most important source of HIV virus. Urine, breast milk and tears are other sources of virus in man, but very seldom from saliva, sweat and sputum.

High Risk Group for HIV :

1. Homosexual and bisexual men;
2. Intravenous drug users and abusers;
3. Person transfused with contaminated blood or blood products;
4. Heterosexual contacts of HIV infected partners;
5. Children of HIV infected mothers;
6. Sexually promiscuous individuals; and
7. Asymptomatic individuals carrying HIV.

In the western world, homosexual man accounts for more than 70 per cent of high risk groups. In Africa heterosexual mode of transmission has been more common. In India considering the social practice, heterosexual partners of HIV infected individuals could be a more common group at risk. Professional blood donors are plenty in India. STD patients crowd the outpatient department. Thus all these groups form priority risk groups in India.

Symptoms of AIDS:

Most people infected with the HIV have no symptoms and appear to be in sound health. Within a period of 2 to 5 years, 10 to 30 per cent of infected individuals develop AIDS and 25 to 30 per cent AIDS related complex. Most of the symptoms of AIDS are similar to those associated with cold and stomach upset. The symptoms of AIDS happen because the immune system of the patient has been damaged.

AIDS is caused by the human retro virus HTLV III (Human T Lymphotropic - retrovirus). AIDS represents end stage of HIV infection. The early stage of HIV infection manifests as an acute viral episode

and in course of average 3 years, a percentage of patients develop full blown disease, *i.e.*, AIDS. The virus is now known as HIV-1 (Human Immunodeficiency Virus). Immunodeficiency of AIDS is due largely to loss of T helper cells both in number and function. The biological defect is one of cell mediated immunity leading to increase susceptibility to infection by organisms which normally are eliminated by similar mechanisms.

The organisms which remained latent from prior infection cause disease when immune defence becomes impaired because of profound immune defect. Many of the symptoms and signs may be subtle as the rate of disease progression is insidious. AIDS can present with a wide spectrum of clinical features ranging from asymptomatic infection. There may be no symptoms of infection. There may be generalised lymph glands enlargement. Fever, fatigue, loss of body weight, diarrhoea, night sweats may be the symptoms of AIDS. In some others oral infection, herpes or pneumonia, neuropathy may be the presenting signs. In some it would be brain infection or appearance of cancer (Kaposi's sarcoma).

Symptoms of AIDS

Most symptoms of AIDS are similar to those associated with cold and flu like fatigue, fever etc. But the symptoms of AIDS lasts longer. If the unexplained symptoms persist for more than 2 to 3 weeks AIDS should be suspected. The symptoms could be in the form of fatigue, fever, sore throat, loss of body weight, persistent headache, shortness of breath, dry cough and swollen glands. Want of defence mechanisms of body leads to infection by bacteria and virus and cancer. Additional symptoms of infection and cancer appear if the disease advances. Chest infection produces bronchitis and pneumonia which cause cough, fever, chest pain and breathlessness. Intestinal infection produces loss of appetite, vomiting and diarrhoea and abdominal pain and exhaustion. Brain infection results in headache, fever, vomiting, confusion and loss of consciousness. Infection of skin and special organs produce abscess, exhaustion and impaired function of senses.

Management

In the absence of specific cure for the disease, broad approaches to the treatment of AIDS are general management, treatment of specific infections or tumors, antiretroviral therapy. General management includes avoidance

of malnutrition and avoidance of infection, counselling and education about AIDS and HIV and hospital and community support. The main focus of medical management has been the treatment of opportunistic events as they arise supplemented by maintenance treatment for infection. Therefore prompt diagnosis and appropriate treatment of many of the infections can restore patients temporarily to a state of good or reasonable health. Knowledge of the structure and mode of replication of HIV has allowed the identification of a number of patient targets for antiviral chemotherapy.

Guidelines on First AID

In order to avoid or significantly minimise the risk of acquiring blood borne infection including HIV, work places should develop policies to meet those situations where first aiders are exposed to blood while administering first aid. If first aiders are exposed to blood on skin that is not intact, the affected area should be washed with soap and water. A first aider injured by a contaminated object with blood (*e.g.*, needles) should encourage bleeding, wash the wound with soap and water and if necessary apply a dressing. In rare instances if injuries are severe first aiders may need further investigations, including assay of the first aiders blood for HIV and other infections. If the initial test is negative follow up testing should be performed in three and six months later.

Two major situations where contact with body fluid of another person occurs are in the management of bleeding and mouth to mouth resuscitation. Bleeding requires immediate attention. The first aider should instruct the person bleeding to apply pressure to the wound using a clean thick cloth. If the bleeding person is unconscious, or uncooperative or if the wound is too large or located in a place the person cannot reach, the first aider should apply pressure to the wound with clean cloth avoiding direct contact with blood. Gloves should be used if available.

Care should be taken to prevent blood from coming into contact with broken skin or the mucous membrane of the first aider. If first aiders' hands are contaminated with blood he should not touch his eyes or mouth. HIV transmission from mouth to mouth resuscitation has not been reported. HIV has been found in saliva in extremely small quantities. HIV could be

transmitted if the person is bleeding from the mouth. Mouth-pieces used for resuscitation bags or ventilation device should be used by people specially trained to use them as incorrect use may lead to further injury and bleeding. Mouth to mouth resuscitation is a life saving procedure and should not be withheld for fear of contracting HIV or other infections. Spilt blood should be soaked with absorbent material such as cloth avoiding direct skin contact with blood.. Rubber household gloves should be worn if possible The blood soaked absorbent material should be burnt or buried

The area contaminated with blood should then be washed with a disinfectant. Hands should always be washed with soap and water as soon as possible after administering first aid and first aiders should be careful with broken and other sharp objects that may be found in the accident area.

First Aid is generally given to alleviate suffering and in a spirit of compassion. The first aider should weigh the extremely small and theoretical risk of acquiring HIV infection against the benefit gained by the person receiving first aid.

In summary all health care workers should routinely use appropriate barrier precautions to prevent exposure when contact with blood or other body fluids. Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids. All health care workers should take precautions to prevent injuries caused by needles, scalpels and other sharp instruments. Health care workers with eczema and skin disease should avoid all direct patient care. Correct sterilisation of all non sterile needles, syringes and other skin piercing instruments is important to prevent transmission of the virus

Sterilisation and Disinfection Methods

HIV is very sensitive to standard methods of sterilisation and high level of disinfection. Sterilization is a method of disinfection of all microorganisms.

Heat is the most effective method for inactivating HIV. Methods for sterilisation based on heat are the methods of choice. Boiling is the ideal

in most circumstances and this requires only heat, a container and water. All medical instruments that pierce the human body including needles, syringes, scalpels should be sterilised between each patient contact. Medical instruments that touch human body but do not penetrate should ideally be sterilised. If this is not possible they must receive high level chemical disinfection. Glutaraldehyde 2% and hydrogen peroxide 6% are the two most commonly used high level disinfectants. In order to be effective chemical disinfectants should be prepared carefully. They may also rapidly lose their strength, especially if they are stored.

A high level disinfection is achieved when instruments are boiled for twenty minutes. Steam sterilization under pressure (autoclaving) is recommended for reusable medical instruments. The method should be operated for at least fifteen minutes after the load achieves a temperature of 121° C (250 F) equivalent to a pressure of 20 pounds / sq inch atmosphere. The autoclave must not be overloaded.

Chlorine - releasing compounds are appropriate disinfectants for the decontamination for environmental surfaces. Sodium hypochlorite (eg. liquid bleach) is the most widely used compound. Alcohols are not considered suitable for this purpose. Calcium hypochlorite, sodium dichloroisocyanurate (Na Dcc) and chloramin are other chlorine releasing compounds which are suitable and more stable than sodium hypochlorite solution

Prevention through Health Promotion

Providing information and education forms a major weapon against the disease. One important personalised way of doing this is through the services of health professionals. Professional judgement of health workers should not be clouded by emotion

