

AIDS IN DENTAL PRACTICE IN THE TROPICS

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INTRODUCTION:

Acquired Immune Deficiency Syndrome (AIDS) is a name given to a complex of diseases where the immune system has been depressed by an infection of a virus.

This virus, the Human Immune Deficiency Virus (HIV) particularly attacks the T-helper cells (T4) and to a lesser extent B-Cells, macrophages and nerve cells. The T-helper cells play an important role in the cell mediated immunity. The gradual depletion of these T-helper cells will finally result in immune-deficiency. A number of harmless and exotic micro-organisms, parasites, fungi and virus produce opportunistic infection's that are not easy to treat. There is also a chance of neoplasm development such as Kaposi's Sarcoma, Burkitt's Lymphoma and non-Hodgkin's lymphoma. In addition severe neurological disorders, including memory loss, dementia and encephalitis may occur. At present AIDS is a fatal disease. No effective treatment is currently available. Because of the way that the virus infect cells by integrating its genetic information into host genetic code the development of an effective drug will be very difficult. Furthermore, as the virus has the ability to change the antigenic structure of its outer capsule thereby escaping recognition by the host immune system, it complicates the development of an effective vaccine.

INFECTION AND PROGRESSION OF THE DISEASE:

After infection with HIV, antibodies (seroconversion) will appear after 2 to 8 weeks, although it may take up to several months. However, these antibodies do not kill the virus. In the period of sero conversion, a minority of patients experience a short term illness similar to mononucleosis like symptoms.

In the following months to years several clinical symptoms may appear known as AIDS related complex (ARC). Persistent lymphadenopathy may occur alone or in combination with night sweats, fever, diarrhoea, weight loss, fatigue and infections such as candidiasis and herpes zoster. These symptoms may persist for years in some patients. In others, ARC seems to be an intermediate stage between infection and fully blown AIDS, the last stage of HIV infection. As defined by U.S. Centre of Disease Control (U.S.C.D.C.), AIDS is characterized by life-threatening opportunistic infections and/or cancers that occur in people with otherwise unexplained defects in immunity. These infections and cancers occur because people with AIDS have lost most of their natural defences against certain infections and are unable to fight them off.

AIDS was defined as:-

- 1) The presence of a reliably diagnosed disease, such as Pneumocystis Carinii, pneumonia or Kaposi's sarcoma, that signals an underlying deficiency in the immune system, and
 - 2) The immune deficiency is not due to drugs, certain types of cancer, congenital disease, or other known cases.
- Between 1982 and 1985, HIV was discovered, tests to detect

HIV antibodies were developed; and other illnesses associated with the virus were recognized. Thus in 1985 USCDC expanded its case definition to include:-

3) Certain other opportunistic infections and cancers of lymphoid tissue in people found to harbour HIV or who tested positive for HIV antibodies.

Since the latter part of the USCDC definition depends partly on laboratory tests, diagnosis of AIDS where laboratory tests are not available is based on clinical features. These include lymphadenopathy in combination with a variety of opportunistic infections and neoplasms.

The spectrum of clinical symptoms in people with AIDS varies in different regions, usually reflecting the infections prevalent in these regions. In Africa, the most common clinical symptoms are chronic diarrhoea and weight loss known as "slim disease".

It is difficult to say how many people infected with HIV will develop AIDS or ARC. The incubation time seems to be long in some cases up to seven (7) years and long term prospective studies are not yet available.

The longest study to date followed seropositive homosexual men in San Francisco for five (5) years. Eighteen (18%) percent have developed AIDS and 45% have developed ARC. The previously estimated rates (5 - 10%) for development of AIDS seem to be too low.

N.B:-

AIDS, the syndrome, is only the tip of the iceberg; for every AIDS case there are three to five cases of less severe ARC and anything between 50 and 100 silent carriers capable of transmitting the virus.

EPIDEMIOLOGY:-

The reported cases of AIDS are only a fraction of existing cases for several reasons. First, where diagnostic facilities are not available, a majority of cases may be missed. Second, cases of AIDS are reported only when they meet the laid down criteria. In fact, however, the immune deficiency characteristic of AIDS can lead to many other serious illnesses. These may not be reported or even diagnosed as related to AIDS. Third, and perhaps most important, many people are already infected with the virus that causes AIDS, but symptoms may not appear for several years after infection. Until August 1986, only five years after the syndrome was first described, almost 29,000 cases have been reported around the world. But WHO estimates that the actual number of cases may be as high as 100,000.

Although to date most cases have been reported in the US, AIDS appears to be increasing rapidly in some other countries, especially in Africa.

Among developing countries, AIDS appears to be most common in Brazil, Haiti and Central Africa. Some 739 cases were reported in Brazil by June 1986 and 377 in Haiti. In the sub-Saharan Africa nine countries had officially reported a total of 378 cases by August 1986, but WHO estimates that there have been at least 50,000 cases since 1980. The disease may have

first appeared in the late 1970s in Zaire, about the same time that it first appeared in the US. By 1984, based on hospital admissions and a survey of doctors, researchers estimated an annual incidence of 17 to 18 cases per 100,000 in Kinshasa, Zaire and 80 cases per 100,000 in Kigali, Rwanda. Cases have also been reported in neighbouring countries of Zambia, Kenya, South Africa and Uganda.

In June 1986, 535 female prostitutes were screened for HIV antibodies in Nairobi and 67% were positive. In Uganda, during the same period, 100 persons attending outpatient clinic, Kitovu hospital Masaka, 30% were seropositive. About 0.6% of 495 children aged between 8 and 19 months, attending outpatient MCH clinic in Butare, Rwanda were positive for HIV antibodies.

In Tanzania, a study has been done in rural Kagera. In the study out of 78 barmaids screened for HIV, 31% were positive. In a preliminary investigation of 40 patients attending Dental OPD clinic in the period of April 1987, about 12.5% were HIV positive. It is estimated that about 3 - 5% of patients attending STD clinic at MMC are HIV positive. The current rate of admission of AIDS cases at MMC is about 2 cases per day. The prevalence of HIV infection in the general population is not yet understood.

TRANSMISSION:

The fear among dentists treating AIDS patients has focussed on patients with fully blown AIDS. However, patients with ARC, and apparently healthy individuals with antibodies to HIV are, for most part, carriers of that virus, and can transmit it to others.

Most reported cases of AIDS have been sexually transmitted. Only the most intimate contact, usually involving the transfer of semen or blood from one person to another can spread the virus. Although the pattern of transmission of HIV closely resembles that of hepatitis B virus, AIDS is much less contagious than hepatitis B. Unlike diseases such as tuberculosis and measles, the virus that causes AIDS is not transmitted through the air by inhalation. Although HIV could be detected in saliva, there is no evidence that it is transmitted by casual contact. More than ten (10) studies involving some 600 family members of people with AIDS show no evidence of transmission of the virus except to sexual partners or children born to infected mothers.

HIV is transmitted by:-

- 1) **Sexual intercourse.**
- 2) **By transfusion of contaminated blood or blood products.**
- 3) **By sharing or re-using contaminated needles; and**
- 4) **From mother to child during pregnancy and child birth.**

Certain sexual patterns and practices increase the risk of infection more than others. Relations with multiple sexual partners increases the chances of being infected with the virus. Among sexual practices, intercourse with an infected partner is especially likely to lead to infection the mucosa lining of the rectum being delicate tears easily during anal intercourse. This might explain the relatively large risk groups of male homosexuals and

bisexuals in the US and Europe having the disease. In contrast in Africa, women appear to be about as likely as men to be infected with HIV, which suggests that heterosexual intercourse is also a major means of transmission. At the same time, intramuscular injections are common in this continent and may be an important mode of transmission. Thus it is difficult to determine exactly what percentage of cases are sexually transmitted.

HIV is transmitted among intravenous drug users by sharing needles and syringes in which small amounts of contaminated blood are transferred. In this respect it is of interest for the dentist and other dental health care workers whether needle stick injuries could result in infection with HIV.

Whether an infection with HIV will occur after exposure with the virus depends on the dose of virus transmitted, the portal of entry, and possibly the host resistance. Subdermal or intramuscular injuries by contaminated needles and sharp instruments may be less likely to lead to infection than intravenous transmission of the virus as practiced by drug users. Firstly, because in the latter situation higher dose of virus may enter the body and secondly because the virus directly enters into the blood stream.

In five separate studies, a total of 1,498 HCW's had been tested for the HIV antibody. In these studies 666 (44.5%) of the HCW's had direct parenteral or mucous membrane exposure to patients with AIDS or HIV infection. Twenty-six HCW's in these studies were seropositive when first tested, all but three persons belonged to groups regarded as being at increased risk for AIDS. Only two of these workers were probably occupationally related to HIV infection. This represents less than 0.5% risk of acquiring HIV by accidental contaminated needlestick injury. A risk (0.5%) that is much lower than the risk (6 - 30%) of acquiring hepatitis B by accidental needlestick injury.

TRANSMISSION AND PREVENTION OF HIV INFECTION IN DENTAL PRACTICE:

There is no data available as yet regarding the transmission of HIV infection in dental practice. Therefore, the following discussion is mainly based on literature from the medical field. Both dental health care workers and patients can acquire HIV infection under certain instances. Dental patients can acquire HIV infection in any of the following ways:-

- 1) When non-sterile instruments are used between patients, and some of them are infected with HIV.
- 2) When sterilized instruments are used, but the environment containing the instruments has been contaminated by aerosol from previous patients infected with HIV.
- 3) When an operator is doing an invasive procedure with hands/gloves contaminated with HIV.
- 4) When a carrier dentist, having lesions on his hands, is performing an invasive procedure without gloves.

Such a risk to the patients can be reduced by:-

- 1) Steam sterilization (121° C for 20 minutes at 15 lbs/Sq. in) of intra-oral instruments.

Where duplicate instruments are lacking for the next patients, instruments can be dipped in boiling water for at least twenty minutes. HIV and hepatitis B cannot stand this condition. This condition can be achieved even in rural areas with minimal facilities.

- 2) The use of disinfectants for intra-oral instruments should be discouraged. The reason is that disinfectants require:- fresh supplies, appropriate dilutions, frequent changes, and adequate disinfection period.

Sterile instruments should be kept in a clean place without risk of contamination

- 3) Whenever possible sterile gloves should be used for each patient. In case this cannot be achieved, the operator can keep his gloves in his hands and wash them between patients. Washed gloves can be rendered almost bacteria free when washed with disinfectants, such as 10% povidoneiodine. The washing of soiled hands is very difficult.

- 4) Blood from patients may accumulate in the subungual areas and may remain under the fingernails for upto five (5) days. It is also suggested that leaching of this blood by saliva is a possible mechanism of cross contamination. In case gloves are not available at all, thorough washing of hands with soap and water should be practised. In such cases, if the operator is having lesion(s) on his hand(s), he/she should abstain from treating patients until the condition has subsided.

The working dentist is also at risk of acquiring HIV infection especially from the healthy-looking carriers. This can occur in the following ways:-

- 1) As discussed above, accidental injury by contaminated needles and sharp instruments. So instruments and needles should be handled carefully to minimize accidents and should be disposed off in non-puncturing containers.

- 2) Through lesions on the unprotected hands of an operator doing an invasive procedure in an infected patient. Such risk can be avoided by wearing gloves.

- 3) In certain procedures, there is formation of aerosols, containing a mixture of saliva and blood. In such cases, the operator should put on masks and glasses to reduce infection on mucosa. In addition, small particles like calculus and pieces of amalgam, from an AIDS patient, can cause lesion on the face of an operator, which may serve as portal of entry for the HIV.

Although the risk of acquiring HIV infection in this way is unlikely it cannot be excluded. The reason for the risk being low is that the virus will be very much diluted in saliva and spray water and the portal of entry is superficial in this case. To exclude any risk of acquiring HIV by this route, it is advisable to use face masks and glasses during the performance of procedures involving formation of aerosols.

5. Impression taken from patients mouth can contain a mixture of saliva with variable amount of blood, which may serve as a source of infection. Impression taking should there-

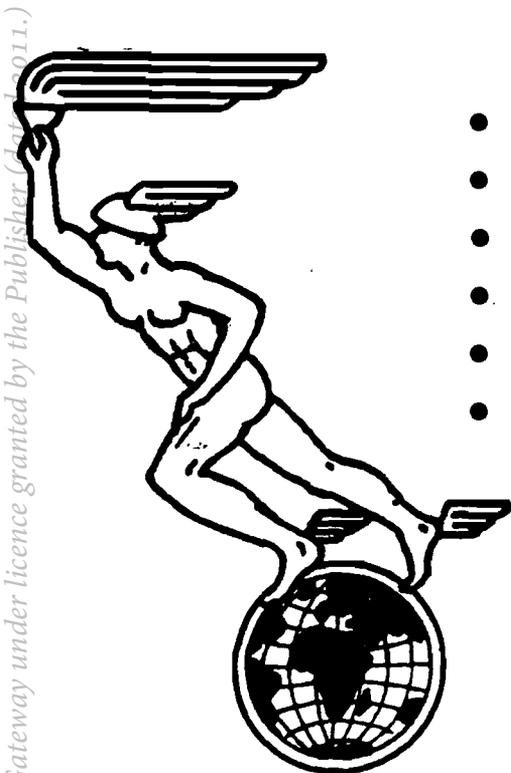
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fore be done with gloved hands, and the impression should be disinfected before taking them to laboratory. In case disinfectants are not available, thorough washing with soap and water should be advocated.

ORAL MANIFESTATIONS OF AIDS:

The first clinical manifestation of AIDS occur relatively frequently in the oral cavity. In addition those who experience full blown AIDS will often show oral manifestations as a result of the immunodeficiency caused by HIV. A large variety of oral manifestations may occur due to opportunistic infections and cancers (see table below). A number of these manifestations may also occur in HIV negative patients. It is difficult from a clinical point of view to judge if these manifestations are associated with HIV or not, although such a distinction is important because prognosis after treatment is better in the latter. The most common type of mycotic opportunistic infections is candidiasis that may occur before full blown AIDS is manifested. However candidiasis may also occur under other conditions e.g. antibiotic treatment, hormonal disturbances, xerostomia, and as a result of denture hyperplasia. Thus it is not always easy to discriminate the different etiological backgrounds of the manifestation. However, if candidiasis does not respond to normal treatment, and extension to the oesophagus occurs, HIV infection is likely to be the cause. The clinical appearance may vary widely (e.g. a pseudomembranous, erythematous, and hyperplastic types) making differential diagnosis with other manifestations (e.g. different leukoplakia forms and lichen planus) difficult.

Viral infections that may become manifested in the oral cavity are herpes simplex, herpes zoster, and a new manifestation called hairy leukoplakia that is more likely caused by Epstein-Barr virus. Hairy leukoplakia is mostly seen on the tongue and less frequently on other sites in the oral cavity.

Its clinical appearance is characterized by a somewhat elevated and irregular white surface that cannot be removed by scraping such as in cases of pseudomembranous candidiasis. The term "hairy" is a little misleading because it is actually characterized by a hairy as well as a fine lobulated appearance. The latter characteristic is the distinct feature from idiopathic leukoplakia. However, hairy leukoplakia and idiopathic leukoplakia occur in different age groups, between 20 and 40 years and over 40 years respectively.

Less common viral infections associated with HIV are papilloma virus infections that may occur with varying clinical features.

Microbial infections like ANUG and periodontitis that are common in otherwise healthy patients, may be associated with HIV infections. In such cases treatment is difficult and prognosis is unfavourable. The neoplasm in the oral cavity associated with HIV is Kaposi's sarcoma. Clinically it may be characterised by a brownish-blue pith on the oral mucosa.

In the following stages, there is an elevated irregular invasive growth and an ulcerative manifestation, although it can sometimes present as an epulis. Other cancers associated with HIV are rare in the oral cavity (see table).

Finally, the so called idiopathic manifestations can occur in the

oral cavity. These conditions are associated with HIV but are caused by aetiological agents that are yet to be known.

Generally speaking the diagnosis of AIDS related lesions in the oral cavity is difficult. Even if the diagnosis of these conditions is made early enough, little can be done about treatment and prognosis of AIDS patients. Currently, the treatment of such oral lesions is usually symptomatic and palliative.

Due to lack of definitive treatment of AIDS, and since each patient is regarded as a potential source of HIV infection and is handled carefully, the diagnosis of oral lesions in the oral cavity is largely of academic and epidemiological values.

TABLE:
ORAL MANIFESTATIONS ASSOCIATED WITH HIV INFECTION

MYCOTIC INFECTIONS	VIRAL INFECTIONS	NEOPLASMS
Candidiasis:- Pseudomembranous	Herpes Simplex	Kaposi's Sarcoma
Erythematous	Herpes Zoster	Squamous cell CA
Nodular and plaque like hyperplasia	Hairy Leukoplakia	Non-Hodgkin's Lymphoma
Angular Cheilitis	Poliovirus -Verruca Vulgaris -Condyloma Acuminatum -Local Epithelial Hyperplasia	
Histoplasmosis		
Geotrichosis		

BACTERIAL INFECTIONS
Exacerbation of periodontitis apicalis
Acute Necrotizing ulcerative Gingivitis (ANUG)
Progressive Periodontitis
Enterobacterium cloacae
Mycobacterium avium
Intracellulare
Klebsiella pneumoniae

IDIOPATHIC INFECTIONS
Recurrent aphthous ulceration
Necrotizing ulcerations
Epidermolysis
Delayed wound healing
Thrombocytopenic purpura
Salivary gland enlargement

There are many carriers of HIV that are not recognized. Since it is not possible to screen all dental patients and neither is it desirable to do it, it is most important to practise sterilisation meticulously for every patient, so as to minimize the spread of HIV. All DHCWs must be aware of sources and methods of transmission of HIV. The previously mentioned recommendations for HIV control in dental practice should be effective in preventing the transmission of HIV from DHCWs and vice versa. Therefore, provided aseptic techniques are followed, there should be no fear of contracting AIDS while providing dental treatment.

This article compiled by Dr. Matee was adjudged as the 'best entry' in the essay competition jointly organised by TDA and ACHES (I) in 1988.

Editor.