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HIV A Deadly Virus: Clinical Knowledge

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Abstract
HIV is a deadly virus and the person living with HIV is growing in the world. In rural and backward area, the knowledge regarding HIV is still less and this disease decrease the life of a person. The reality of mode of spread of infection, the occurrence of infection, the exposure of infection in Dentist is more as compared to other Profession of Medical world. Dentist is still doing all types of work like extraction, filling, Denture making without knowing the facts and figures of HIV related Disease. The aim of this article is to deal with the clinical aspect of HIV related issue.
Keywords: *HIV, Dentistry, AIDS.*

Introduction

In 1981 AIDS (Acquired Immunodeficiency Syndrome)was first identified that this disease is life thr eating disease and spreading worldwide.[1] Kimberly Ann Bergalis was an American woman who was one of six patients purportedly infected with HIV by dentist David J. Acer, who was infected with HIV and died of AIDS in September 1990. In September 1990 one case has been reported of Kimberly Ann Bergalis that she has been infected with HIV by a dentist David J Acer and died of AIDS.[2] Dentist knowledge regarding HIV is Satisfactory but doing work in clinical the satisfactory should be updated with perfection.[3] In patient the more common problem is bleeding from gums i.e. Periodontitis which leads a patient to visit a Dental Clinic. The Dentist without knowing that periodontitis is one of the major symptoms that a patient might be HIV infected.[4]It is found that the discrimination of dentist to HIV infected person is more than 50%.[5] The total number of people living with human immunodeficiency virus (HIV) in India is estimated at 21.40 lakhs in 2017 and Bihar (1.15 lakhs) is among one of the Seventh high prevalence states in India.[6]

Clinical View

HIV virus is deadly virus and in 1993 CDC (Centres for Disease Control and Prevention) gives the report that if CD4+ T-lymphocyte counts

remain below 200/mm^3 or less than 14% of T lymphocyte have this deadly disease. In the initial stage there is no symptom of this infectious virus, but there are some cases where a mononucleosis-like illness develops 2 to 4 weeks after infection and lasts about 2 to 6 weeks. Due to this infection the person might feel rash, fever, malaise, arthralgias, and hepatosplenomegaly. Meningitis might present in some cases. The virus in its early stage persist in the genome of some cell and the person infected with this deadly virus.[7] Dr. David Ho introduced highly active antiretroviral therapy (HAART) in 1995 and it has transformed the infection from a death sentence to a chronic disease.[8] HAART has minimum effect on oral salivary flow. It has also decrease the Candida infection in the oral cavity.[9]

AIDS Diagnosis:[10,11]

There are 40 known Oral lesion of AIDS known as per date. HIV infection is basically divided into two categories. The first classification is based on aetiology and the second one is based on severity of infection. Based on aetiology it is fungal, bacterial, viral, neoplastic and others. Based on severity it is lesions strongly associated with HIV infection, lesions less commonly associated with HIV infection, and lesions seen in HIV infection.

AIDS is diagnosed when an individual with HIV develops at least one of these conditions:

1. CD4+ T cell count drops below 200 cells/mm3.
2. Development of one of the following opportunistic infections (Ols):
   - Viral: cytomegalovirus (CMV) disease other than liver, spleen, or nodes; CMV retinitis (with loss of vision); herpes simplex with chronic ulcer(s) or bronchitis, pneumonitis, or esophagitis; progressive multifocal leukoencephalopathy (PML); extra pulmonary cryptococcosis
   - Fungal: candidiasis of bronchi, trachea, lungs, or esophagus;
   - Bacterial: *Mycobacterium tuberculosis* (any site); any disseminated or extra pulmonary mycobacterium, including *M. avium* complex or *M. kansasii*; recurrent pneumonia; recurrent Salmonella septicaemia
   - Protozoal: disseminated or extra pulmonary coccidioidomycosis, toxoplasmosis of the brain, chronic intestinal isosporiasis; chronic intestinal cryptosporidiosis
3. Development of one of the following opportunistic cancers:
   - Invasive cervical cancer, Kaposi's sarcoma (KS), Burkitt's lymphoma, immunoblastic lymphoma, primary lymphoma of the brain, or cervical carcinoma
4. Wasting syndrome occurs: defined as a loss of 10% or more of ideal body mass.
5. Dementia develops.

HIV Manifestation in oral Cavity:[12]

1.	Viral Infection	Herpes simplex*Herpes zoster (varicella zoster) Cytomegalovirus, Epstein-Barr virus Hairy leukoplakia, Human papillomavirus, Oral warts, Condyloma acuminatum, Focal epithelial hyperplasia
2.	Bacterial Infection	Linear gingival erythema* Necrotizing ulcerative periodontitis* Necrotizing stomatitis Mycobacterium avium intracellulare Actinomycosis.
3.	Fungal Infection	Candidiasis*, Pseudomembranous, Erythematous Hyperplastic Angular chelitis, Histoplasmosis Cryptococcosis Geotrichosis
4.	Neoplasm	Kaposi's sarcoma* Non-Hodgkin's lymphoma.
5.	Others	Facial palsy, Trigeminal neuropathy, Recurrent thrombocytopenic purpura, Recurrent aphthous ulceration*, Herpetiform, Immune thrombocytopenic purpura Salivary gland enlargement Xerostomia Melanotic pigmentation.

*More Common Oral Lesion.

Patient indication to start Antiretroviral Therapy[13]

S.No.	Clinical Category	CD4 + T Cell Count	Plasma HIV RNA	Recommendation
1	Symptomatic (AIDS, Severe symptom)	Any Value	Any Value	Treat
2	Asymptomatic, AIDS	CD4 + T Cell < 200/mm^3	Any Value	Treat
3	Asymptomatic	CD4 + T Cell 200/mm^3 – 350 mm^3	Any value	Treatment should generally be offered, though controversy exists*
4	Asymptomatic	CD4 + T Cell < 350/mm^3	>30,000 (bDNA) or >55,000 (RT-PCR)	Some experts would recommend initiating therapy, recognizing that the 3-year risk of developing AIDS in untreated patients is >30%. In the absence of very high levels of plasma HIV RNA, some would defer therapy and monitor the CD4+ T cell count and

				level of plasma HIV RNA more frequently. Clinical outcomes data after initiating therapy are lacking.
5	Asymptomatic	CD4 + T Cell < 350/mm^3	<30,000 (bDNA) or <55,000 (RT-PCR)	Many experts would defer therapy and observe, recognizing that the 3-year risk of developing AIDS in untreated patients is <15%.

Inactivation and Disinfection of HIV:[14]

Does HIV react to disinfectants as predicted by Klein and Deforest? This question can be answered based on laboratory studies. First, the experimental laboratory conditions must be defined, then the results must be interpreted based on comparisons with the laboratory conditions and the conditions that may exist in body fluids such as blood. In the human body, cell free HIV enters the CD4+ lymphocyte and can either become latent in the cell or replicate resulting in new virus being released into the surrounding milieu where virus may infect another CD4+ cell. The number of infected cells/ml in an infected individual's blood is estimated to be about 100-1000. The titer of cell free virus is estimated to be about 100 or less. Both cell-free HIV and infected cells may be present in the circulating blood.

In the laboratory, cell free HIV can be grown in CD4+ tissue culture cells. Generally, the virus containing supernatant fluid is harvested and the titer of cell free virus ranges from 104 to 106 per unit volume, titers higher than generally found in blood. The amounts of protein and other organic materials in laboratory tissue culture fluid are usually less than that found in blood.

Laboratory inactivation studies have been performed by mixing an equal volume of virus containing fluid and disinfectant for varying periods of time. Following the inactivation process, serial dilutions of each test disinfectant and controls were plated into CD4+ cells. After 7 days, the supernatant fluids from each dilution were harvested and tested for presence of virus using an ELISA. Additional incubation time may be needed to detect low levels of virus remaining following the inactivation step. The lack of viral replication indicated inactivation of the virus by the disinfectant. Controls must be done to determine if the test disinfectant killed the indicator CD4+ cells which would also result in no detection of viral replication.

Summary of chemical inactivation for cell free HIV :[15-27]

S.No.	Chemical	Concentration or Percentage reported to inactivate cell free HIV
1.	Sodium hypochlorite	>52.5 ppm
2.	Glutaraldehyde	0.0125%
3.	Glutaraldehyde-alkaline	1-2%
4.	Formaldehyde	0.04-2%
5.	Formaldehyde + *β*-propiolactone	0.025-.25%
6.	Paraformaldehyde	0.5%
7.	*β*-propiolactone	0.025-25%
8.	Acetone	50%
9.	Ether	100 %
10.	Hydrogen Pereoxide	0.3%
11.	Betadine II	0.125-.5%
12.	Betadine Surgical Scrub	.005-.025 available I_2
13.	Sodium Hydroxide	0.12%
14.	Phosphoric acid	2-8%

Conclusion

A Precise knowledge is necessary to handle a HIV infected person in medical as well as in dental field. Oral lesion is the first and foremost sign to know HIV infected person. After doing Surgical or non-surgical work a medical person should know how to clean their instrument before using to another person. In day to day life the difficulty index to diagnose HIV infected person and treatment plan depends upon the more and more knowledge regarding HIV DEADLY VIRUS.

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