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Oral Lesions in HIV

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Abstract: *Acquired Immune Deficiency Syndrome (AIDS) is caused by the Human Immunodeficiency Virus (HIV). It is a critical disorder of the immune system which severely damages the body's normal defences to infections. Oral lesions in Human Immunodeficiency Virus (HIV) infection are common. Over 30 different types of oral conditions have been reported to occur in patients with HIV disease. It must be understood, however, that the oral lesions seen in HIV positive patients are a result of immunodeficiency caused by the Human Immuno-deficiency virus and not due to the direct effect of the virus on oral tissues. Even common dental diseases such as caries and periodontal disease have greater impact on patients with HIV infection. Therefore, it is essential that the physician and dentist, together, identify and reduce risk factors for oral diseases in the patients with HIV infection.*

Keywords: *AIDS, HIV, Periodontium, fungal infection, oral lesions, HAART*

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I. Introduction

The emergence and pandemic spread of the Acquired ImmunoDeficiency Syndrome (AIDS) has posed the greatest challenge to the public health in modern times. Rarely has any new disease had as great an impact on medicine, science and society and caused as much panic among the public and governments globally as AIDS.

It was first reported in 1981, when cases of a rare neoplasm, Kaposi's sarcoma and Pneumocystitis carnii pneuomonia (an unusual opportunistic infection only seen in immunocompromised patients – for example,chemotherapy patients and those with severe malnutiriton) were reported in the U.S.A. in previously healthy homosexual men. This was the beginning of the epidemic eventually termed the Acquired Immuno Deficiency Syndrome(AIDS)[1]. AIDS since then has killed more than 25 million people, despite recent improved access to anti-retroviral therapy and care in many regions of the world. The AIDS epidemic claimed 3.1 million (between 2.8- 3.6 million) lives in 2005 of which more than half a million (570,000) were children. Globally, between 36.7 and 45.3 million people is currently living with HIV[2].

HIV, the etiologic agent of AIDS, belongs to a family of Lente virus sub group of a family Retroviridae. It is a virus with a special affinity for the CD4 receptors molecule,which is situated on the surface of the T helper lymphocyte, The other cells affected are the Monocyte, Macrophages, Langerhan cells, B Lymphocytes. Endothelial cells and the cells in the brain. As a result of the HIV infection the number of CD4+ cells decreases. The ratio of the CD4 to CD8 cell ratio is increasingly reduced with the progression of the disease. The host increasingly becomes susceptible to several infectious diseases and neoplasm. Infection with HIV essentially requires the exchange of semen, vaginal or other body secretions, milk or blood products infected with the virus. The hetro sexual route accounts for over 75% of the global cases. Now the threat of Perinatal transmission is increasing globally with the increase in the number of HIV infected women. Intra venous drug users are also at risk of HIV infection as a result of the practice of needle sharing[1].

Oral lesions not only indicate infection with HIV, they are also among the early clinical features of the infection and can predict the progression of the HIV disease to Acquired Immuno-Deficiency Syndrome (AIDS). They can therefore be used as entry and end points in therapy and vaccine trials and can be determinants of opportunistic infections and anti HIV therapy and can be used in staging and classification systems. Oral manifestations are the earliest and most important indicators of HIV infection. Seven cardinal lesions like oral candidiasis. Hairy leukoplakia, Kaposis Sarcoma, Linear Gingival Erythema, Nercotizing Ulcerative Gingivitis and Non-Hodgkin's lymphoma are strongly associated with HIV infection and have been identified internationally. These lesions may be present in upto 50% of people with HIV infection and upto 80% with the diagnosis of AIDS. These oral lesions are usually clearly visible and can be diagnosed reliably

from the clinical features alone. The presence and development of these oral lesions can be used as entry criteria and end points for prophylaxis and therapy[3].

II. Modes Of Transmission

Infection with the Human immunodeficiency virus essentially requires exchange of semen vaginal or other body secretions such as milk, blood or blood products infected by the virus. There are 3 possible modes of transmission of HIV.

1. Sexual
2. Perinatal
3. Parenteral

III. Clinical Categories of HIV Infection

Category A

Consists of one or more of the conditions listed below in an adolescent or adult (>13 years) with documented HIV infection. Conditions listed in categories B and C must not have occurred.

- Asymptomatic HIV infection
- Persistent generalized lymphadenopathy (PGL)
- Acute (primary) HIV infection with accompanying illness or history of acute HIV infection[4].

Category B

Consists of symptomatic conditions in a HIV infected adolescent or adult that are not included among conditions listed in clinical category C and that meet at least one of the following criteria[4]:

1. The conditions are attributed of HIV infection or are indicative of a defect in Cell mediated immunity; or
2. The conditions are considered by physicians to have a clinical course or to require management that is complicated by HIV infection. Examples include, but are not limited to the following:

- Bacillary angiomatosis
- Candiiasis, oropharyngeal (thrush)
- Candidiasis, vulvovaginal; persistant, frequent or poorly responsive to therapy
- Cervical dysplasias (moderate or severe), cervical carcinoma in situ
- Constitutional symptoms, such as fever (38.5^0C) or diarrhea lasting > 1 month
- Hairy leukoplakia (oral)
- Herpes zoster (shingles), involving at least two distinct episodes or more than one dermatome.
- Idiopathic thrombocytopenic purpura
- Listeriosis
- Pelvic inflammatory disease
- Peripheral neuropathy

Category C

Conditions listed in the AIDS surveillance case definition[4]

- Candidiasis of bronchi, trachea or lungs
- Candidiasis, oesophageal
- Cervical cancer, invasive
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (> 1 month's duration)
- Cytomegalovirus disease(other than liver, spleen or nodes)
- Cytomegalovirus retinitis (with loss of vision)
- Encephalopathy, HIV – related
- Herpes simplex: Chronic ulcer (s) (>1 month's duration); or bronchitis, pneumonia or oesophagitis
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (> 1 month's duration)
- Kaposi's sarcoma
- Lymphoma, BUrkitt's (or equivalent term)
- Lymphoma, primary of brain
- Mycobacterium avium complex or M.kansii, disseminated or extrapulmonary Mycobacterium tuberculosis, any site (pulmonary or extrapulmonary)
- Mycobacterium, other species or unidentified species, disseminated or extrapulmonary
- Pneumocystis carnii pneumonia
- Pneumonia recurrent
- Progressive multifocal leukoencephalopathy

- Salmonella septicemia, recurrent
- Toxoplasmosis of brain

IV. Oral Lesions In Aids

Oral lesions are prominent in HIV- infected patients. The frequency of these lesions is predictable based on past knowledge gained treating patients with primary immune deficiencies or haematologic malignancies, or those receiving drugs that suppress the immune system. HIV – related lesions of the head and neck have particular significance because of the following[5].

- They are often the first sign of HIV disease.
- They have prognostic value
- They are a frequent cause of morbidity and an occasional cause of mortality.

Knowledge of proper treatment can add to the quality of life of HIV patients[5]

Significances of Oral Lesions in HIV Infection

- Can indicate HIV infection
- Early clinical features of HIV infection
- Predict progression of HIV disease to AIDS
- Entery or end-points in therapy and vaccine trials[6]

4.1 CANDIDIASIS

Candidiasis is the most common oral lesion in HIV diseases and has been found in approximately 90% of AIDS patients who have had an AIDS defining illness[7]. Candidosis is the most common fungal infection of the oral cavity and is caused by an overgrowth of commensal Candida species. Candida albicans (C. albicans) is the most commonly isolated species in both health and disease. Oral candidiasis may present in a variety of clinical forms:-

Pseudomembranous candidiasis

This form of the disease is the most common in immunocompromised individuals such as infants, the elderly, those on corticosteroid or long term broadspectrum antibiotic therapy, those with severe underlying conditions such as poorly controlled diabetes mellitus, leukemia, and HIV infection/AIDS[8].It is characterized by whitish creamy plaques resembling milk curds on the tongue, palate and buccal mucosa,The lesions can be wiped away leaving behind an erythematous mucosal surface which may bleed slightly. The plaques consist of necrotic material, desquamated epithelial cells, fibrin, yeast cells and hyphae, food debris, and bacteria[9]

Erythematous candidiasis

This variant, previously known as "antibiotic sore mouth", is mainly associated with the chronic use of broad spectrumantibiotics. Broad-spectrum antibiotics lower theoral bacterial population and facilitate subsequent overgrowth of Candida by alleviating competitive pressures. Clinically, erythematous candidiasis is characterized by localized erythematous areas commonly on the dorsum of the tongue and palate, and less commonly on the buccal mucosa Erythematous candidiasis is the only form of oral candidiasis that is consistently painful[9].

4.2 HAIRY LEUKOPLAKIA

Oral hairy leukoplakia (OHL) is more common among HIV-infected adults than among HIV-infected children. The reported prevalence of OHL in adults is about 20%-25%, increasing as the CD4+ lymphocyte count decreases, whereas in children the prevalence is about 2%-3%[25].Oral hairy leukoplakia (OHL) is a lesion frequently, although not exclusively, observed in patients infected by human immunodefficiency viruses (HIV). OHL is clinically characterized by bilateral often elevated, white patches of the lateral borders and dorsum of the tongue. Histologically, there is profound acanthosis, sometimes with koilocytic changes, and a lack of a notable inflammatory infiltrate.the clinical features are typically unilateral or bilateral, adherent, slightly elevated whitish or gray patches ,Principally located mainly on lateral margins, dorsum, or ventrum of the tongue and Occasionally observed over the floor of the mouth, palate, or oropharynx ,usually asymptomatic[10]

4.3 KAPOSI'S SARCOMA

Kaposi's sarcoma is the most common malignancy associated with HIV infection and is oral and perioral in 50% or more of patients with mucocutaneous Kaposi's sarcoma,Oral KS typically presents as red-bluish swellings with or without ulceration which are most common on the palate,gingiva and dorsal tongue. Gingival involvement occurs in 23% of cases. The tumour initially manifests as reddish purple or bluish patch which later presents as nodules resembling a hemangioma or peripheral giant cell granuloma. Kaposi's sarcoma in HIV- infected individuals is a much more aggressive lesion[11].

4.4 LINEAR GINGIVAL ERYTHEMA

Linear gingival erythema is a gingival condition of immunosuppressed people. Growing evidence supports the theory of a fungal origin for this condition[12]. It is classified by the American Academy of Periodontology as a disease of fungal aetiology[13]. The lack of response of linear gingival erythema to oral hygiene measures and conventional periodontal therapy is important in diagnosis. initially discrete petechiae that may coalesce into a 1-3 mm wide, intensely erythematous band on the marginal gingivae. This condition is unlike gingivitis induced solely by dental plaque in that the erythema associated with linear gingival erythema is disproportionate to any local factors, such as plaque and calculus[14], found along the gingivae and may be localised or generalized, usually no significant symptoms, however the gingiva may be tender and bleed easily.

4.5 NECROTIZING ULCERATIVE GINGIVITIS

Necrotizing ulcerative gingivitis presents with pain, ulceration and gingival bleeding. The lesion does not involve the alveolar bone [15]. The characteristic lesion is a punched out, ulcerated and erythematous interdental papilla covered by a greyish necrotic slough, gingival tissues particularly the interdental papillae moderate-to-severe pain, bleeding and fetor oris. Systemic features such as fever, malaise and lymphadenopathy may be present sudden onset and rapidly deteriorating,based on clinical findings- gingival pain, ulceration, necrosis and bleeding[16]

4.6 NECROTIZING ULCERATIVE PERIODONTITIS

Necrotising ulcerative periodontitis presents identically to necrotising ulcerative gingivitis with pain, ulceration and gingival bleeding except the lesion involves the alveolar bone[14]. ulcerated erythematous gingival tissues, particularly the interdental papilla, covered by a greyish necrotic slough. There may be exposed bone, gingival recession and tooth mobility. the interdental papilla extending into the deeper periodontal tissues, moderate-to-severe pain, bleeding and fetor oris. Systemic features such as fever, malaise and lymphadenopathy may be present, sudden onset and rapidly worsening

4.7 NECROTIZING ULCERATIVE STOMATITIS

extensive area of ulceration, tissue necrosis and erythema that extends from gingiva into the adjacent mucosa and may involve bone leading to osteonecrosis and sequestration[14]. periodontal tissues and may extend into the maxillary or mandibular bone, moderate-to-severe pain, bleeding, fetor oris. It is usually associated with systemic symptoms of fever, malaise and lymphadenopathy, sudden onset and rapidly worsening

4.8 HERPES VIRUS INFECTIONS

HSV has two main types, type 1 and type 2. HSV when it appears on the lips is known as herpes labialis or a cold sore. Primary infection may be very severe whereas recurrent infections are usually less severe. Disseminated infection and herpes encephalitis is possible. In people with HIV infection, recurrent HSV infection is common[13]. Herpes labialis presents as multiple small vesicles or ulcers on the lips and may include adjacent skin. Intra-oral HSV infection presents as small, round vesicles that rupture, leaving shallow ulcers which can coalesce. The lesions are superimposed on an inflammatory, erythematous base, lesions occur on the lips and anywhere in the oral cavity. In the mouth, HSV is commonly found on keratinised epithelium, including hard palate, gingiva and dorsum of the tongue, but in people with HIV infection it can sometimes be found on non-keratinised epithelium, prodromal symptoms may be present. The lesions may give mild-to-severe pain. They may be localised or widespread, involving the entire oral cavity and lips. Fever, lymphadenopathy and other symptoms may occur especially with a primary infection, rapid onset with duration of 7–14 days.

4.9 ORAL HYPERPIGMENTATION

An increased incidence of oral hyperpigmentation has been described in HIV – infected individuals. Oral pigmented areas often appear as spots or striations on the buccal mucosa, palatal gingiva or tongue. In some instances the pigmentation may be due to the prolonged use of drugs such as ketoconazole, and clofazimine. In some cases pigmentation may be the result of adrenocorticoid insufficiency induced in an HIV-positive individual as a result of prolonged ketoconazole use or by infections such as those of pneumocystis carinii or cytomegalovirus[7]

4.10 XEROSTOMIA

2-10% of people with HIV infection are affected by xerostomia (dry mouth). The cause of xero- stomia is multifactorial and can include a CD8 lympho-cytosis syndrome related to HIV infection or side effects of medications or by opportunistic infections of salivary tissue. Enlargement of salivary glands occurs at a rate of less than 1% in adults but more commonly in children.Saliva has many roles including: immune functions,

lubrication, digestion and protection of the oral hard and softtissues. Xerostomia can therefore reduce quality of life and lead to many dental complications[14]

4.11 APHTHOUS ULCERS

Recurrent aphthous stomatitis is common in HIV- infected individuals and may be minor, major or herpetiform in nature. However according to EC- Clearinghouse the overall incidence of recurrent aphthous stomatitis may be no greater than that in the general population. Recurrent aphthous stomatitis may occur as a component of the initial acute illness of HIV seroconversion. The clinical features so characteristic of aphthae are quickly altered as the lesions persist and present as large nonspecific, painful ulcers. The incidence of major aphthae may be increased, and the oropharynx, oesophagus or other areas of the gastrointestinal tract may be involved. Patients with major aphthous ulcers often have very low CD4 cell counts[7, 17].

V. Management

Goals of periodontal disease treatment in HIV-positive patients are:

- To reduce dental morbidity and overall mortality and improve the quality of life
- To restore and preserve adequate immunocompetence
- To surpass viral load maximally and durably

Chemotherapeutic agents used in treatment of HIV: since the mid 1990s HAART(highly-active antiretroviral therapy) is a widely used recognized and highly acceptable treatment approach for management of HIV infection. It is a combination of various drugs that significantly modify the course of HIV infection, slow down the disease progression and improve survival rate. The drugs commonly used are

- **Nucleoside reverse transcriptase inhibitors**- Azidothymidine, zalcitabine, iamivudine, stavudine
- **Non-Nucleoside reverse transcriptase inhibitors**- Delavirdine and nevirapine
- **Protease inhibitors**- Saquinavir, indinavir, ritonavir, nelfinavir
- Entry (fusion) inhibitors

HAART significantly increases absolute CD4+ lymphocyte counts, reduces HIV viral load and improves patient survival even when absolute CD4+ lymphocyte counts decreases

Linear gingival erythema

- Meticulous oral hygine instructions
- Scaling, subgingival irrigation with chlorhexidine
- Chlorhexidine digluconate 0.12% mouth wash
- If persists, evaluate for candidiasis and retreat if necessary

Necrotizing Ulcerative Gingivitis

- Debridement of necrotic lesion and light scaling
- Scaling and root planning
- Chlorhexidine digluconate 0.12% mouth wash
- Meticulous oral hygine
- Antibiotic: metronidazole 400mg BID for 5-7day

Necrotizing Ulcerative Periodontitis

- Scaling, root planning and subgingival irrigation
- Removal of necrotic soft tissues utilizing a 0.12% chlorhexidinr digluconate or 10% povidone-iodone lavage
- Antibiotic: metronidazole 400mg BID for a week
- Prophylactic systemic antifungal agent
- Frequent follow-up visits

VI. Conclusion

Evaluation of oral health status is important at every stage in the management of HIV disease. Oral candidiasis is the most common oral pathology in HIV infected patients, followed by a large spectrum of other oral manifestations. The necessity to identify HIV-related oral lesions behoves all health care professionals – primary health care workers, infectious diseases specialists, oral health and public health professionals – to closely collaborate to provide the best care, health promotion and prevention possibilities for patients infected with HIV. A major challenge lies in the part of HIV- infected persons unaware of their HIV status. Oral health practitioners must take their role in recognizing the potential signifi cance of the oral manifestation of HIV. In the future, the dental offi ce may become a site for rapid testing for HIV.

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