

Review Article

Role of Dental Professional in the Management of HIV Infected People

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Abstract: The need for cross-infection control in dental practice has received increasing attention in recent years because of greater awareness of communicable diseases such as Hepatitis B and acquired immunodeficiency syndrome (AIDS). Dentists, auxiliary personnel, and dental laboratory technicians may be exposed to a wide variety of harmful microorganisms daily. Cross-contamination between patients and dental personnel can occur not only through contaminated dentures but also through polishing agents and instrumentation. This article highlights the role of dental professional to prevent the transmission of diseases between patients, dentists and lab personnel.

Keywords: Aids, Hepatitis B, Contamination, Microorganisms, Cross-infection, Dentist

INTRODUCTION

It is devastating fatal disease which is in epidemic form throughout the world. It is an incurable disease cause by Human immunodeficiency virus [1]. This virus is a non oncogenic human retrovirus belonging to lentivirus group type III. The word AIDS stands for "Acquired Immuno Deficiency Syndrome".

The HIV virus causes Slow infection in which sign and symptom only appear many months or year after infection.

WHO Definition

Absence of all known underlying causes of cellular immune deficiency (other than HIV infection) & absence of all other causes of reduced resistance reported to be associated with at least one of these opportunistic diseases [2].

HISTORY [3]

- 1981 – First case reported and was believed to be limited to homosexuals. It was called as gay compromised syndrome, gay related immune deficiency, gay cancer or community acquired immune dysfunction.
- 1982 – AIDS among women was reported
- 1984 – Dr. Robert Gallo isolated the virus Name HTLV-III
- 1987 – WHO notified 43880 cases in 91 countries. Zidovudine (AZT) was approved by FDA (Food and drug administration) for treatment of aids

- 1988 – 1st December World AIDS day
- 1991 – Red ribbon became the international symbol for AIDS
- 1996 – Joint United Nation programme on AIDS, bringing six agencies tighter WHO, UNDP (United nations development programme), UNICEF (United nations children fund), UNFPA (United nations population fund), UNESCO (United nations educational, scientific & cultural organization) become operational on January 1st.
- 1997 – AIDS Epidemic
- 1998 – "Young people :force for change" World aids campaign was prompted in part by epidemics threat to those under 25 years of age
- 1999 – 4th Biggest killer UNAIDS estimated that 3.3 crore people around the world were living with HIV/AIDS
- 2003 – "3 by 5" Plan announced by WHO to provide treatment to 30 lakh people suffering from aids in poor countries by year 2005 [4].
- 2006 – Results of "3 by 5" showed that only 13 lakh people in low and middle income countries had been receiving anti retroviral treatment [5].

Epidemiology in India

- 1986 – First case of HIV/AIDS was reported in female commercial sex worker at Chennai. This was almost a decade later

then its appearance on globe. There after cases were reported from Mumbai and north eastern states of Manipur. The number of cases of HIV/AIDS continues to spread from these epicenters. [6]

VIRAL STRUCTURE

- 120nm diameter, icosahedral RNA virus.
- Outer envelope-lipid bilayer which has 72 spikes, composed of glycoprotein 120 and glycoprotein 41.
- Gp 120 protrudes out on the surface.
- Gp 41 embedded in the lipid matrix.
- It contains two copies of single stranded RNA.

Nucleocapsid is composed of

- outer matrix protein p17
- major capsid protein p24
- nuclear protein p15
- Proteins p7 and p9 are involved in gene expression.

VIRAL CORE [7]

Bullet shape core containing 9 genes & Enz Reverse transcriptase.

- gag gene forms core of virion
- pol gene forms integrase, RNase, protease, rev transcriptase
- env gene forms gp160 (gp120 & gp41)

ORAL LESIONS

- Orofacial lesions may identify HIV-positive people.
- HIV-related oral lesions have been shown to be the first clinical sign of HIV-infection in both industrialized (oral candidiasis; hairy leukoplakia) and resource-poor countries (oral candidiasis; noma; herpes zoster).
- Prognostic significance of HIV-related oral lesions has been well described in industrialized countries, but is mainly applicable in resource-poor countries.
- Early diagnosis is needed for optimal treatment of HIV-related oral lesions, in particular lesions such as acute necrotizing ulcerative gingivitis and necrotizing ulcerative periodontitis [8].
- Diet counselling

Infection control measures with a focus on dental setting

Pathogenic organisms like HIV can be transmitted in dental settings through-

- Direct contact with blood, oral fluids or patient materials.
- Indirect contact with contaminated objects.
- Contact of conjunctiva, nasal or oral

mucosa with droplets containing micro-organisms generated from an infected person. [9]

Modes of occupational exposure

- Patient to DHCP (Dental Health Care Personnel), including dentists, hygienists and assistants.
- From DHCP to patient.
- From patient to patient.

PROTOCOL FOR UNIVERSAL PRECAUTIONS IN DENTAL CLINIC

It can be divided into the following

Before start of treatment

- Clean all items and equipment with detergent
- Line the waste bucket with a plastic bag
- Change hand towels, arrange sterile instruments and disposable syringes and needles
- All treating staff to wear protective covering [10].

During Procedure

- Local anaesthetic syringes should not be refilled
- Over gloves should be used by the dentist or an assistant should handle the following surfaces:
 - Light handle
 - Chair control buttons
 - Telephone
 - Patient records

In between patients

- Wipe tray holder with disinfectant solution and clean spittoon.
- Change airrotor, ultrasonic insert and light cure tip
- Used disposable items should be carefully discarded, reusable items should be sterilized [11].
- Change the tumbler and fresh bib for each patient

At the end of day

- Clean the instrument tray and spittoon
- Remove the plastic bag from waste bucket and send for incineration
- Run the air rotor lines for 2-3 minutes to flush the hoses
- Do normal end of day mopping of floor and walls

PERSONAL PROTECTIVE BARRIER

Staff protection measures

The wearing of gloves reduces contamination of hands with blood. They may be disposable or sterilizable gloves. If re-sterilization is planned, the gloved hands should be washed with soap and rinsed

again. The gloves should be checked for holes and discarded if defective. The gloves that pass the test can be dried, powdered and packed for sterilization [12].

Surgical Gown

- Hands should be washed between patient contacts, after removing gloves and before wearing them again. Use of disinfectant scrub like chlorhexidine after washing will have a prolonged antibacterial effect against microbial ingress through the gloves. Hands must also be washed after touching intimate objects likely to be contaminated by blood or saliva from patients and before leaving the dental treatment area.
- Use of mask is usually indicated especially during procedures that cause splashing or spattering of blood or saliva. It is recommended that facemasks should be changed once every hour or between each patient contact, whichever occurs first.

Protective eye wear

It may be in the form of glasses and / or a face shield. It should prevent trauma to the eye tissue from flying droplets or aerosols. Protective glasses should be washed with soap first, rinsed with water and wiped with an appropriate surface disinfectant.

Management of instruments

They should be cleaned and dried, lubricated if necessary and packaged before loading into the autoclave. Cleaning involves an initial presoaking with detergent solution containing disinfectants to soften organic debris and begin microbial kill. After cleaning the instruments should be dried.

- All moving parts of the instruments especially hand pieces should be lubricated prior to steam sterilization. The burs should be autoclaved or maintained in high level disinfection for not less than 3 hours. Thorough rinsing should be followed to remove all traces of disinfectant [13].
- Touch surfaces like unit handles, light handle, light switch, chair controls, head rest knob, trolley handle, trolley and 3-way syringes cannot be disconnected and sterilized and therefore need to be treated with disinfectants or covered with a protective barrier.
- Disinfection of surfaces involves the cleaning of surfaces, after every patient and application of a disinfectant chemical. These chemicals include alcohol (spirit), iodophor products, synthetic phenols, glutaraldehyde, chlorines etc.
- The advantages of barriers include ease and speed of insertion, standard sizes and the protection of equipment from damage by

chemicals, blood and fluids.

- Spittoons should be flushed with water, scrubbed and disinfected.
- Waste buckets should be used with disposable plastic bags as liners to be changed wherever necessary.

Reducing aerosols in the clinic

Preoperative mouth rinses with chlorhexidine gluconate or other suitable disinfectant mouth wash should help reduce infectious particles in aerosols. Rubber dam isolation is another method to reduce potentially infective aerosols. High volume secretion during procedures using copious irrigation and even the routine use of saliva ejectors can restrict aerosolization. All blood and body fluids contaminated with blood should be treated as infectious.

STERILIZATION AND DISINFECTION

Patient items are categorized based on the potential risk for carrying infection-

- Critical- surgical instruments, periodontal scalars, should be heat sterilized.
- Semi-critical- mouth mirror, amalgam condensor, low risk of transmission, should be heat sterilized.
- Non-critical- radiographic head/cone, least risk.
- Light handles and X-ray unit heads should be wrapped with aluminium foil or clear plastic wrap.

Care with high speed handpieces

- Retention of oral fluids into internal compartments of the device.
- Retained material can be expelled intra-orally during subsequent uses.
- Possibility of retention of viral DNA and viable virus inside high speed handpieces.
- Any dental device run to discharge air or water for 20-30 seconds after each use.
- Intended to flush out retained material.
- Handpieces and other intra-oral devices should be heat sterilized.

Post Exposure Prophylaxis

Most of the exposures do not result in infection. The risk of infection varies-

- The amount of blood involved in the exposure.
- The amount of virus in the patient's blood.
- Whether post exposure prophylaxis were taken.

Steps taken on Exposure

- Needle sticks and cuts washed with soap and water.
- Splashes to the nose, mouth or skin, flushed with water.
- Eyes should be irrigated with clean water, sterile irrigants.

- Pricked finger should not be put in mouth.

Drugs and dosage

- In India Zidovudine and lamivudine are used.
- ZDV- 200mg -8Hrly.
- Lamivudine in combination with zidovudine - 150mg- 12 hrly.
- Optimal course-4 week

CONCLUSION

HIV/AIDS is a debilitating condition that affects the body's immune system. Several opportunistic oral infections can develop in individuals affected by HIV/AIDS. Oral opportunistic infections may be the first sign of immune decline, either in the patient who has not yet been diagnosed with HIV or in the patients under medical care who is experiencing lapse in or failure of HIV drug treatment effectiveness. So routine dental care is important for HIV/AIDS patients and is not likely to result in any greater rate of complication.

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