International Journal of Research in Science and Technology http://www.ijrst.com/
(IJRST) 2011, Vol. No. 1, Issue No. III, July-Sept **ISSN: 2249-0604**

BIOHAZARD DISEASES & ITS PREVENTION IN DENTISTRY

***Dr. Shashank Babel, #Dr.Anu Sangwan**

**B.D.S., Private Practitioner*

#B.D.S.

ABSTRACT

Biohazard diseases poses a threat to the health of living beings, primarily of humans [6].While performing their jobs dental health care workers are exposed to multitudinous occupational biohazards which are mainly in form of contagious diseases. So,it is important and mandatory for every fraternity of dentistry to know about biohazard diseases [2].During carrying dental procedure on patient, dental health care workers are exposed to saliva, microorganism, blood which can lead to occupational hazards. Dental health care professionals are subjected to potential infection from needle stick injury, direct transcutaneous transfusion from infected blood products and indirectly through skin and bruises. This kind of infection can lead to HIV, Hepatitis B, Tuberculosis, Pneumonia and other infections. Therefore health care worker (HCW) training and education regarding infection with biohazard disease is an essential part of administrative controls in dental office. HCW training and education can increase adherence to infection-control measures. Relying on relevant literature, the present paper discusses selected occupational hazard diseases, its mode of transmission and prevention for biohazard cases [4].

INTRODUCTION

In dental office, the risk of Biohazard infection is a high priority issue, considering the nature of oral environment which is rich in diverse aerobic and anerobic bacterial flora & more hazardous viral pathogens [8].It is the necessity of time to learn how to break the chains of biohazard infections in dental office .An understanding of biohazard diseases commonly encountered during dental practice is essential for all dental health care workers.

The Review of guidelines has been prepared specifically to assist infection control practitioners in the integrated management of hospital-associated infections prevention and control (for both curative and preventive activities such as good environmental practices like proper administration of health care wastes, water quality control, etc.) and to ensure that health care administrators understand the significance of infection control programmes .This understanding will help dental care professionals understand the need for careful compliance with recommended infection control protocol. The ultimate aim is to protect yourself, office staff and your patient from illness and reduce the no. of pathogens shared between people which can spread from:

1. From patient to dental health care workers
2. From dental health care workers to patient
3. From patient to patient
4. From dental office to community

Most commonly encountered biohazard disease are : -

1. Tuberculosis

Tuberculosis is caused by Mycobacterium tuberculosis and spreads to dental health care worker by means of airborne particles released from cough, from contact with infected saliva, through dental procedures if cross contamination is allowed to occur [1]. Pulmonary tuberculosis is mainly encountered due to exposure in dental office. Tuberculosis is a fatal disease, can lead to death if left untreated.

Tuberculosis can be detected easily by skin prick test (montoux test) & chest radiograph and treatment for tuberculosis is a regimen of antibiotics.

Prevention by use of rubber dam & high volume suction & operating air should be vented to outside is not recirculated and by means of other protective measures.

2. Herpes

Herpes virus is also known as herpes simplex and is commonly occurring viral infection in dentistry. Primary infection is occupational hazard in dentistry.

Herpes simplex virus type I is related to viral infection of lips, oral mucosa, mouth, face and herpes simplex virus type II is sexually transmitted & mostly often associated with genital herpes [3].

Traumatic infection of dentist's fingers (herpetic whitlow) is a dental hazard

Herpes spread through contact with fluids and gloves should be worn even for examination.

3. Methicillin resistant staphylococcus aureus(MRSA)

MRSA is a Hospital acquired infection and may result in fulminating diseases like Ludwig angina.

May contaminate facial wounds of trauma cases or patient receiving post operative care.

Treating dental surgeon should be suspicious of any long standing wound infection not responding to antibiotics or surgical management.

Ensure that operating surgeons should not perform surgeries until declared negative for carriage [7].

4. Hepatitis

Most infectious disease of significance to dental surgeon.
Hepatitis A is not a blood borne disease so not included in biohazard disease and mainly transmits by oro-fecal route.
Hepatitis B and Hepatitis c are included in biohazard disease and their mode of transmission are :-

a) Direct transcutaneous transfusion from infected blood products
b) Indirect through skin cuts/ bruises
c) Absorption through mucosal surface
d) Perinatally (at birth)
e) Heterosexual /Homosexual contact with infected person
f) Via Inanimate vectors
g) Needle sharing during I.V. use

Hepatitis B presents the highest occupational risk for dental health care workers and one of the most serious form of Hepatitis.

If surgery is necessary, obtain preoperative prothrombin time and bleeding time to prevent complication.

5. H.I.V.

HIV disease, human immunodeficiency virus a retro virus, which may eventually become AIDS(acquired immunodeficiency syndrome) , is a blood borne pathogen HIV is transmitted through blood, semen, or saliva contaminated body fluids and is less infectious than Hepatitis B but has a fatal outcome [3].
The risk of a health care worker acquiring HIV after a needle stick or other "sharp" injury is less than 0.5%.

SPECIAL CONSIDERATION FOR BIOHAZARD CASES

General

1. Most importantly treating dental surgeon or hygienist should be aware of potential risk of self injury while performing the procedure on a biohazard patient and should be alert all the time[5]

2. Ensure additional precautions by indicating appropriate signage on the door (for example, biohazard logo)[7]

3. Room for biohazard cases should be separate

4. Instrument selection in advance and kept in a tray with cover[5]

5. All unnecessary instruments should be removed from room of treatment

6.Appointments given at end of day

7. Patient with known biohazard diseases should be asked to consult/obtain clearance from the physician/ respective department for dental procedure

8. Dental treatment should not be performed until there is emergency,Try to manage conservatively.

Pre procedural

1. All universal precautions should be followed strictly for biohazard cases like gloving, protective eye wear, head cap, protective clothing, mask and use good hand hygiene

2. Double mask, Double gloving technique should be used

3.Whole dental unit should be covered with waterproof sheathing

4.Disposable plastics should be used

5.Use of disposable gown during clinical procedures in such patients[8]

6.A disposable plastic bag should be placed inside the waste basket with the edges turned over its rim

7. Cover broken skin

8. Pre procedural rinsing of the patient's mouth with antimicrobial solution[8]

9.Formalin fumigation

Procedural

1. Aerosol formation should be limited by means of high volume suction, rubber dam and minimizing the use of ultrasonic scalers & handpiece

2. Ensure that dental burs and sonic/ultrasonic scaling tips are removed from handpiece when not in use

3. Should there be any spillage of blood , area should be saturated with 1% sodium hypochlorite

4. If the records and radiographs must be present they should be covered by barriers, i.e. clear plastic sheets

5. Wise to use hand instruments for periodontic scaling and root planning instead of ultrasonic instruments which increase aerosolization

6. Finger guard should be used while suturing in such patients

7. Needle should not be recapped, should be discarded directly into puncture resistant container

Post procedural

1. Biopsy specimens and cultures should be placed in a sturdy container with a secure lid to prevent leakage during transport. Care must be taken to avoid contamination of the outside of the container when collecting the specimens. If the outside of the container is contaminated, it should be placed in an impervious plastic bag or other container and labeled as "contaminated". All specimens must be handled using universal precautions. Specimen containers which leave the facility must be labeled with the "Biohazard" symbol. Alternatively, a red tag or red container may be substituted as a label.

2. Impressions, Cast, Jaw relation records used in mouth of patient should be rinsed & disinfected

3. Disposable gown , mask , gloves ,plastic sheets covering all dental units and all the material coming in contact with the patient, including gauze should be discarded into a plastic bag lined waste bin and this bag containing waste should be sent for incineration.[5]

OTHER PRECAUTION

1. Needle instruments management [9]

- Needles and syringes should be passed in a tray
- Preferably cut needles with needle cutter
- Cap of needle should be removed near sight of injection
- Needle should be safely disposed off
- Documentation of a sharp injury should be done and it should be managed by prophylaxis and immunization.
- Needle should not be recapped using both hands

2.. Dental instruments should be heat sterilized or autoclaved between each patient to protect against possibility of cross infection from patient to dental health care worker and patient to patient.

3. Immunization recommended for dental health care workers includes: hepatitis A & B, influenza, measles, mumps, rubella, tetanus, and diphtheria [7]

4. Staff should be trained for management of sharp injury or exposure to blood

Biomedical waste management: should be strictly followed in dental office[9].

- Yellow bag: Infectious non plastic material i.e. Tooth, Gauze piece, cotton, blood dressings, Dissected human parts, Impression material should be disposed
- Red bag: Infectious plastic & personal protective equipments i.e. Mask , gloves , suction tip & tube should be disposed
- Green bag: Non infectious material i.e. Paper waste , left over food item ,plastic cover of syringes & iv bottles , paper swept , plaster of paris
- Sharp container(Blue) : For blades and needle
- Plastic Bins : Non infectious plastics i.e. Saline bags ,vials, bottles
- Cytotoxic waste i.e. Anticancer drugs should be disposed off in separate container
- Amalgum should be disposed off in separate container.

Management in cases of exposure

1. Hepatitis C: Blood should be withdrawn at baseline 3, 6, 12 months from exposed person (dental health care professional). If there is no seroconversion ,dental health care worker must be reassured.
2. Hepatitis B: Usually dental health care workers are immunized against Hepatitis A&B. Blood should be taken and check for antibody level-

!If antibody level is < 10 µ/ml: Accelerated dose of immunization along with Immunoglobulin

! If antibody level is >100µ/ml: Reassurance to

Dental health care worker

!If antibody level is between 10-100 µ/ml: Immediate booster dose should be administered.

3. AIDS : Treatment with antiviral drugs like Zidovudine 200mg B.D. for 28 days or Lamivudine 150mg B.D. for 28 days and acyclovir 1 to 2 gm daily orally or i.v. , however they have side effects.
4. Tuberculosis : Regimen of antibiotics is given in case of exposure

First line of drugs- Isoniazid, Rifampicin, Pyrazinamide, Etambutol 2 months , then Isoniazid & Rifampicin alone for further 4 months

Second line of drugs-Aminoglycosides, Thioamides, Cycloserine , p-aminosalicylic acid, Fluoroquinolones are included in this.

DISCUSSION

During carrying dental procedure on patient, dental health care workers are exposed to saliva, microorganism,blood which can lead to occupational hazards[4].

Dental personnels are at constant risk of contacting the disease while treating the patient of biohazard diseases. It is known that smallest droplet of contaminated saliva from the patient may be sufficient source of contagion for dental care health professional. Therefore universal precaution should be followed at any cost. Training dental health care workers is especially essential because of the leadership role they frequently play in fulfilling infection control

Universal precautions should be used for all patient at all times as patient by him/herself would not tell that they are suffering from any communicable diseases like Hepatitis , HIV etc. So for precautions from unknown exposures universal precautions should be followed strictly in dental office.

So, the general objective of these guidelines is to provide administrators and Dental health care workers with the tools to enable them to implement the infection control programmes effectively in order to protect themselves and others from the transmission of infections. [7]

REFERENCES

1. Paul A. Jenson , PHD ; Lauren A. Lambert , MPH ; Micheal Iademarco , MD ,Guidelines to preventing the transmission of mycobacterium tuberculosis in health care settings ; 2005;54:17-18

2. Dr. Rajneesh Kumar ; Mann Navjot S , Biohazards in dentistry , IJOS, 2011;2:23-28

3. Safety standards and infection control for dental hygienists ; Ellen Dietz ,CDA , Raula Badavinac ,RDH , Delmar Cengage Learning publisher ,2002;20-22

4. Szymanska J , Occupational hazards of dentistry , Ann Agric Environ med ,1999 ; 6 :13-19

5. Textbook of community dentistry , Satish Chandra , Jaypee Brothers Medical Publisher ;2002:354-355

6. Solid waste technology & management , Thomas H Christensen , John wiley & sons ltd ; 2011;2:11..1.1 chapter

7. Practical Guidelines for infection control in health care facilities , world health organization , SEARO regional publication;2004;41:1- 64

8. Text book of oral medicine; Anil Govindroa Ghom , Jaypee Brothers Medical publisher (p) ltd ;2007:38-40

9. Text book of pedodontics , Shobha Tandon , Paras medical publisher ; 2008:33-38

10. www.Premierinc.com /safety topics /guidelines/ downloads /04- infection control 98.pdf ;accessed 12september 2011

11. http://www.tambcd.edu/resources/facilitiesservices/downloads/env_health/biohazardsafety.pdf ; accessed 20 july 2011