



Research Article

OCCUPATIONAL HAZARD IN DENTISTRY

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ABSTRACT

Working towards the motto of providing quality dental treatment to patients, the dentist compromises on his /her health. Various factors in the dental clinic /dental practice poses health risks to the professionals. From material to working position, patient saliva to blood exposure, limited artificial light to the anaesthetic agents...all pose a risk to dentist's health. The dentist is the victim of modern day emphasis on reduced and simplified motion, the value for this for dentist's health is questionable. Often dentists adopt bizarre positions while treating patients and even though such technique cause minimal patient discomfort, they in turn are rewarded with muscle fatigue, lower backache, shoulder problem etc. Dental professionals are exposed to various occupational hazards ranging from physical, chemical, infectious, mechanical and social hazards. Thus, Occupational hazard can be defined as a risk to a person usually arising out of employment. It can also refer to a work, material, substance, process, or situation that predisposes, or itself causes accidents, or diseases, at a work place. As such risks cannot be engineered out completely out of the dental clinic, appropriate occupational health and safety measures need to be adopted and adhered to, by dental staff. It is also very important for dentists to know the best practices for risk identification and control of risks of injury and disease. Improving health and safety performance will be beneficial for workers in the dental sector, but also for any person who receives special treatment while at the same time reducing the economic and social costs.

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INTRODUCTION

Working towards the motto of providing quality dental treatment to patients, the dentist compromises on his /her health. Various factors in the dental clinic /dental practice poses health risks to the professionals. From material to working position, patient saliva to blood exposure, limited artificial light to the anaesthetic agents...all pose a risk to dentist's health. The dentist is the victim of modern day emphasis on reduced and simplified motion, the value for this for dentist's health is questionable. Often dentists adopt bizarre positions while treating patients and even though such technique cause minimal patient discomfort, they in turn are rewarded with muscle fatigue, lower backache, shoulder problem etc. <sup>1</sup>

Thus, Occupational hazard can be defined as a risk to a person usually arising out of employment. It can also refer to a work, material, substance, process, or situation that predisposes, or itself causes accidents, or diseases, at a work place. <sup>2</sup> The history of occupational hazard awareness can be traced back to the 18th century when Bernadino Ramazzini, who is referred to as father of occupational medicine, recognized the role of occupation in the dynamics of health and diseases. These hazards can pose significant risk to dental practitioners. <sup>2</sup>

Health is wealth and let the earning of wealth not ruin the health of dental personnel. <sup>3</sup> For these reasons, it is therefore important that the dentists should adopt preventive measures. As such risks cannot be engineered out completely of the dental clinic, appropriate occupational health and safety measures need to be adopted and adhered to, by dental staff. <sup>4</sup>

Tyes of Hazards in Dentistry

- Ergonomic Disorder
- Toxic Effects Of Dental Materials
- Microbial Hazards
- Latex Gloves Related Symptoms
- Radiation Hazards
- Visual Hazards
- Auditory Hazards
- Psychological Hazards

Ergonomic Disorder

Ergonomics is defined as a science of adapting the job/or the equipment and the human to each other for optimal safety and productivity. <sup>5</sup>

Classification of Ergonomic Disorder

According to Peter A. Leggat, Ureporn Kedjarune and Derek R. Smith (Occupational health problems in modern dentistry:

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A review. Industrial health 2007; 45: 611-621) ergonomic disorders are classified as: -

- Musculoskeletal disorders (including back, neck and shoulder disorders)
- Varicose veins
- Hemorrhoids
- Carpel tunnel syndrome and other occupational overuse disorders.<sup>4</sup>

According to the Bureau of Labor Statistics (India) in 1995, work related MSDs are among the most prevalent lost-time injuries and illnesses in almost every industry. Work-related MSDs may cause significant pain and suffering among afflicted workers, Work-related MSDs can decrease productivity and the quality of work. They include a group of conditions that involves: Nerves, Tendons, Muscles, Supporting structures such as intervertebral discs.<sup>6</sup>

Varicose veins are enlarged veins that are swollen and raised above the surface of the skin. They can be dark purple or blue, and look twisted and bulging. Varicose veins are commonly found on the backs of the calves or on the inside of the leg. They develop when valves in the veins that allow blood to flow toward the heart stop working properly.<sup>7</sup>

Carpal tunnel syndrome (CTS), or median neuropathy at the wrist, is a medical condition in which the median nerve is compressed at the wrist, leading to paresthesias, numbness and muscle weakness in the hand. Night symptoms and waking up at night is a characteristic of established carpal tunnel syndrome.<sup>8</sup>

#### **Toxic Effects of Dental Materials**

Dental amalgam was First introduced in France in the early 1800s it contains a mixture of mercury with at least one other metal.<sup>10</sup> Mercury have its affect on: Central nervous system, Reproductive system, Effects on eyes, Muscular system, Skeletal system, Respiratory system.<sup>11</sup>

Dentists are exposed to local anaesthetic problem :-By rubbing with the finger a solution, spray or ointment containing a "caine" onto the surface of the gums and in forms of gauze packs or ointment for post extraction sockets. Or By injecting a "caine" compound in the buccal mucosa.<sup>12</sup>

Dentists and dental staff appear to occasionally suffer from hypersensitivity, asthmatic reactions, local neurological symptoms, irritant and local dermatological reactions by Methyl methacrylates<sup>13</sup>

#### **Microbial Hazards**

1. **Hepatitis B Virus:** These DNA viruses are highly infectious, easily transmitted through blood and saliva, and highly resistant to environmental agents, disinfection and sterilization. The dentist may become infected with HBV from a patient both through needle sticks or other accidental percutaneous injuries with sharp instruments, and through an aerosol of blood, saliva or gingival secretion<sup>14</sup>
2. **Hepatitis C Virus:** HCV is a blood-borne virus containing RNA. Hepatitis C is a serious health problem because in 90% cases, infection is asymptomatic. It may develop into a chronic liver inflammation and eventually progresses to cirrhosis and chronic liver cancer. Patients with hepatitis C are more prone to extensive dental

diseases, which increases the risk for dental professionals. 15

3. **Virus Causing AIDs Disease (HIV):** HIV virus causing the acquired immune deficiency syndrome is an RNA-containing retro-virus, transmitted in a blood borne mode and through sexual contact. It attacks human CD-4 lymphocytes, causing a drastic immunity drop and death, most frequently as a result of infection with opportunistic micro organisms, normally indifferent human health. Some of these infections start in the oral cavity, which increases the risk for the dentist.<sup>16</sup>
4. **Herpes Simplex Virus:** Herpes simplex viruses of type 1 and 2 causing a recurrent labial and genital herpes, herpetic whitlow and keratitis represent a particular hazard for dental workers because of their common occurrence and high infectivity. 17
5. **Covid 19:** The virus that caused the outbreak is known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a newly discovered virus closely related to bat coronaviruses, pangolin coronaviruses, and SARS-CoV. The scientific consensus is that the virus is most likely of zoonotic origin, from bats or another closely-related mammal. On 11 February 2020, the World Health Organization (WHO) named the disease "COVID-19", which is short for coronavirus disease 2019. 18

The disease is mainly transmitted via, Person to person by respiratory droplets, face to face communication, direct contact and fomites, directly or indirectly through saliva, contact with contaminated instruments and or environmental surfaces, poor respiratory hygiene and etiquettes, inadequate sterilization protocols. 19

Three common clusters of symptoms have been identified : one respiratory symptom cluster with cough, sputum, shortness of breath, and fever, a musculoskeletal symptom cluster with muscle and joint pain, headache, and fatigue, a cluster of digestive symptoms with abdominal pain, vomiting, and diarrhea. In people without prior ear, nose, and throat disorders, loss of taste combined with loss of smell is associated with COVID-19. 19

#### **Latex Gloves Related Symptoms**

Healthcare workers use latex gloves to reduce the spread of infection and disease when caring for patients. The gloves also protect workers from exposure to chemicals, bodily fluids and other potentially dangerous substances. Often, a powder such as cornstarch is added to make it easier to slip on or remove the gloves. But, powder can aggravate latex allergies. Allergic reactions caused by latex exposure range from simple itching to anaphylactic shock. OSHA estimates that 5.5 to 6.4 million health care workers in the U.S. wear the gloves routinely and that between 250,000 and 500,000 experience some degree of allergy to latex protein.<sup>20</sup> Various manifestations are:- Glove dermatitis, Later hypersensitivity, Atopy. 21

#### **Radiation Hazard**

All ionizing radiations are harmful and produce biological changes in living tissue. The damaging biological effect of X ray radiations were first documented shortly after the discovery of X rays. Since that time information about the harmful effects of high level exposure of x radiations has

increased. The amount of X ray radiation used in dental radiology is small, however biological damage does occur.<sup>22</sup> Radiation effects can be classified as either short term or long term. :

Effects that are seen within minutes, days or weeks are termed as short term effects. Short term effects are associated with large amounts of radiation absorbed in a short period of time. Acute radiation syndrome (ARS) is a short term effect and includes nausea, vomiting, diarrhoea, hair loss and hemorrhage. Effects that appear after years, decades or generations are termed long term effects. Long term effects are associated with small amounts of radiation absorbed repeatedly over a long period of time. Repeated low levels of radiation exposure are linked to the induction of cancer, birth abnormalities and genetic defects.<sup>23</sup>

#### **Visual Hazard**

Dental routine requires the use of normal-speed and high-speed drills for purposes like removing old fillings, preparing carious defects, removing the excess of filling materials, polishing fillings.. Drilling seriously increases the possibility of injuring the eyes of the operator with materials or fragments of tissue. 2

A limited surgical area and its artificial lighting results in eye strain, conjunctivitis, blurred vision or shortsightedness. Other sources of visual hazards are : laser, light curing unit, low intensity light, etc.<sup>24</sup>

#### **Auditory Hazard**

The sources of dental sounds that can be treated as potentially damaging to the hearing are high-speed turbine handpieces, low-speed handpieces, high-velocity Suction, ultrasonic instruments and cleaners, vibrators and other mixing devices, and model trimmers. Also worth mentioning are air conditioners and office music played at too loud a volume.<sup>24</sup> Auditory lesions may remain undetected for years, the severity of the hearing loss can only be detected when the oral communication problems occur. The factors that must be considered in acoustic trauma are frequency of vibration, intensity, length of exposure, intervals between exposures and the susceptibility of the individual.<sup>25</sup>

#### **Psychological Hazards**

Many health care professionals are nowadays exposed to the human distress, anguish and sufferings that were previously dealt with by the sufferer's family and others.

Stress is one such factor which affects the overall performance of a dentist. Dentistry has a reputation of being a stressful occupation. On entering clinical practice dentist experiences numerous workplace. Clinical disorders such as burnout, anxiety and depression may result.<sup>26</sup>

Burnout is defined by three coexisting characteristics. First, the person is exhausted mentally or emotionally. Second, the person develops a negative, indifferent or cynical attitude toward patients, clients or co-workers: this is referred to as depersonalization or dehumanization. Finally, there is a tendency for people to feel dissatisfied with their accomplishments and evaluate themselves negatively.<sup>27</sup>

## **CONCLUSION**

Dental professionals are exposed to various occupational hazards ranging from physical, chemical, infectious, mechanical and social hazards. Infection control procedures and following standard precautions minimizes the risk of infectious hazards. It is also very important for dentists to know the best practices for risk identification and control of risks of injury and disease. Improving health and safety performance will be beneficial for workers in the dental sector, but also for any person who receives special treatment while at the same time reducing the economic and social costs. It is, therefore, recommended that regular workshops and seminars and various continuing dental education programs on occupational hazards should be organized for all clinical dental personnel periodically to update their knowledge about various newer methods and developments and influence their work practices.

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