Aerosol Contamination – A Hazard to Dentists

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Abstract
Aerosols and droplets are produced during many dental procedures. With the advent of the droplet-spread disease, severe acute respiratory syndrome, or SARS, a review of the infection control procedures for aerosols is warranted. Aerosols containing microbes from the oral cavity of the patient are created intensively when using modern high-speed rotating instruments and ultrasonic scalers in dentistry. Aerosols and splatters usually contain microorganisms like bacteria, fungi and and viruses. How far these aerosols spread and what level of contamination they cause in the dental surgery has become a growing concern among the practitioners. Insufficient awareness of health risk, working habits, and economic factors are the reasons why dentists do not apply the available and recommended methods of protection against the influence of bioaerosol and splatter. This poster reviews the hazards of bioaerosol and splatter in dentistry and the full range of protective barrier measures required during dental treatment.

Keywords: Aerosols, barrier, waterlines, pathogens, splatter, hazard.


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Introduction
Dental practitioners are exposed to various infective hazards during various treatment procedures because many infections can be transmitted by blood and saliva through direct or indirect contact, droplets, aerosols, contaminated instruments and equipments. Dental aerosols (Micik and colleagues 1969) was defined as particles smaller than 50µm in diameter. The particle sizes are small enough to stay airborne for an extended period of time before they settle on environmental surfaces. Splatter was defined as particles larger than 50µm in diameter.

Sources of Aerosols

1. Ultrasonic scalers
2. Air powder polishing
3. Preparation of intracoronal cavities.
4. Crown preparations
5. Trimming new restorations
6. Removal of old restorations
7. Endodontic therapy
8. Amalgam restorations (Mercury vapours)
9. Removal of composite following orthodontic treatment
10. Acid etching followed by rinsing and drying.

Pathogens in Aerosols

The main pathogenic microorganisms are

1. Mycobacterium Tuberculosis
2. Hepatitis B Virus (HBV)
3. Hepatitis C Virus (HCV)
4. Cytomegalo Virus
5. Herpes Simplex Virus
6. Human Immuno Defficiency Virus
7. SARS Virus
8. H1N1 Virus

Allergens Fond in Aerosols

1. Latex allergens
2. Formaldehyde vapours
3. Ethylene oxide
4. Hexachlorophene
5. Local anaesthetic spray
6. Mercury vapours

Preventive Measures

Personal Protection barriers like gloves, mouth masks, head caps and protective eye wear can be used to prevent infections induced by aerosols among the practitioners. Aerosol production can be reduced with the use of rubber dam isolation during operative procedures, use of extraoral vacuum aspirators, use of preprocedural antimicrobial mouthwashes, high volume evacuators, high vacuum suctions, saliva ejectors, laminar air purge, high energy particulate air filters, and aerosol management systems.

Dental unit water lines should be treated using aerosol management system, control of storage temperatures and automatic treatment devices, use of sterile water, antiretraction valves and antibacterial filters.
Conclusion

Dental aerosols represent an infection hazard for dental hygienists due to their gross contamination with blood and saliva. The advent of SARS and H1N1 virus and its predicted reemergence in the upcoming flu has brought the danger of aerosols to a higher level. Aerosols can be prevented using various protective measures in the dental office.

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