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Awareness about harmful effects of aerosol contamination among dental students

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ABSTRACT

Possible mechanisms for the transmission of disease in the dental office include close communication with body fluids of patients, interaction with surfaces and instruments which have already been besmirched by the patient, and also interaction with unavoidable particles from patient which have been dispersed airborne. This survey was performed with purpose of assessing the awareness about harmful effects of aerosol contamination in clinical practice among the dental students. A Questionnaire containing ten questions about the awareness and attitudes of dental students toward the harmful effects of aerosol contamination in clinical practice. Then this questionnaire was piloted and distributed to 100 dental students, and information about the opinions and attitudes of dentists aerosol contamination. Salivary transmission of aerosols, procedures causing aerosol contamination, use of rubber dam in preventing contamination and use of personal protection equipments were obtained. The collected data were statistically analysed. 87% of the students were aware of harmful effects of aerosol contamination. 78% were aware of the salivary transmission of aerosol contamination. The awareness about harmful effects of aerosols is adequate among dental students. It is conceivable to limit the hazard with generally basic and reasonable safety measures.



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INTRODUCTION

Aerosol concentrates and splatter produced during the dental procedures have possibility to spread disease to dental staff and others in dental office. While, likewise with all disease control techniques, it is

difficult to totally wipe out the hazard presented by dental aerosol concentrates, it is conceivable to limit the hazard with generally basic and reasonable safety measures.

Possible mechanisms for the transmission of disease in the dental office include close communication with body fluids of patients, interaction with surfaces and instruments which have already been besmirched by the patient, and also interaction with unavoidable particles from patient which have been dispersed airborne. Aerosols were characterized as corpuscles under 50 microns. These particles are sufficiently miniscule to remain airborne and enter the respiratory channel. These vaporized particles can infiltrate the lungs and can transmit diseases (Micik *et al.*, 1969; Miller *et al.*, 1971).

With the reemergence of Tuberculosis, splatter beads additionally should be viewed as a potential

disease danger. Splatter and bead cores additionally have been embroiled in the transmission of illnesses other than TB, such as Severe Acute Respiratory Syndrome, measles and herpes and other viral infections (Anjum *et al.*, 2020; Wyler *et al.*, 1971). Hence, this survey was performed with purpose of assessing the awareness about harmful effects of aerosol contamination in clinical practice among the dental students

MATERIALS AND METHODS

A Questionnaire containing ten questions about the awareness and attitudes of dental students toward the harmful effects of aerosol contamination in clinical practice. Then this questionnaire was piloted and distributed to 100 dental students, and informations about the opinions and attitudes of dentists aerosol contamination, salivary transmission of aerosols, procedures causing aerosol contamination, use of rubber dam in preventing contamination and use of personal protection equipments were obtained. The collected data were statistically analysed.

RESULTS AND DISCUSSION

87% of the students were aware of harmful effects of areosol contamination(Figure 1).78% were aware of the salivary transmission of aerosol contamination (Figure 2). 74% said scaling and 26% said tooth reduction as the most dangerous sources of aerosol contamination (Figure 3).89% were aware of role of rubber dam in preventing aerosol contamination (Figure 4).93% were aware of role of personal protection equipment in preventing aerosol contamination (Figure 5).

There are three possible sources for airborne pollution during dental procedures: dental instruments, saliva or respiratory sources, as well as the surgical site. Contamination through dental instruments is really the consequence of microbes on instruments. Regularly scheduled cleaning and sterilization methods will eradicate contamination of most dental instruments except for those being in the current patient.

The oral cavity is inextricably moist with saliva, which continuously replenishes the fluid in the mouth. Fluids in the mouth are highly contaminated by microorganisms and viruses. Dental plaque is indeed a major refuge for such life forms. It should not be forgotten, however, that perhaps the mouth is, in fact, a piece of oronasal pharynx. As a significant component of this process, the mouth includes microorganisms and pathogens of nose ,

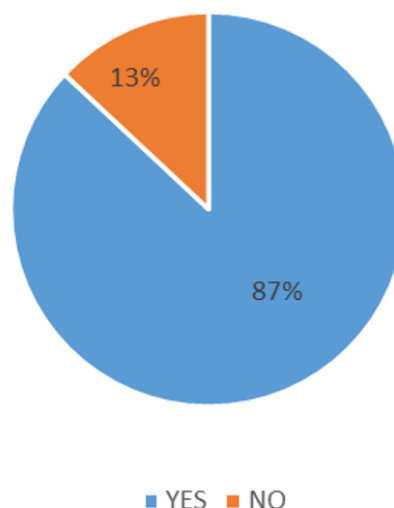


Figure 1: Awareness about aerosol contamination

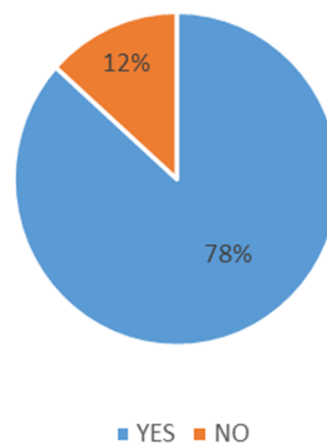


Figure 2: Awareness about salivary transmission of aerosol contamination

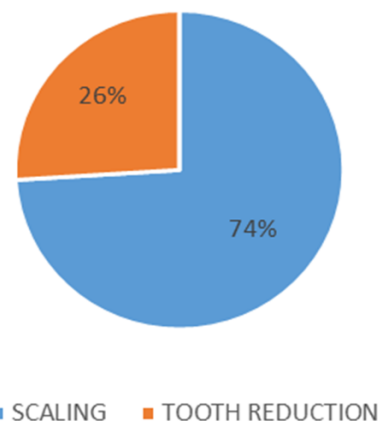


Figure 3: Awareness about most dangerous aerosol producing procedures

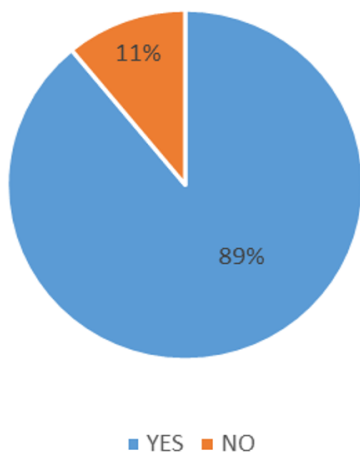


Figure 4: Awareness about use of rubber dam

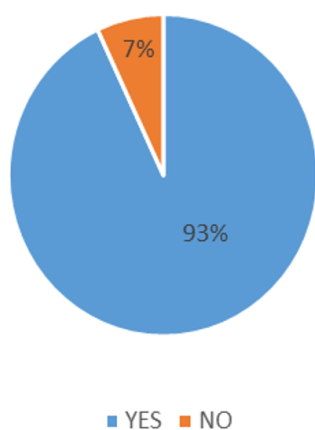


Figure 5: Awareness about use of personal protection equipment

throat and respiratory system. They can involve a number of pathogenic pathogens and microscopic species found in saliva and oral fluids. Every dental procedure which may aerosolize saliva can trigger airborne contamination from several or more sources (King *et al.*, 1997; Muzzin *et al.*, 1999).

The use of universal protection measures in all patients originally relied on the assumption that all patients would have contagious bloodborne diseases such as hepatitis B, hepatitis C and HIV viruses. In fact, it should be approved that all patients may have an infectious ailment that can possibly be spread by dental pressurized canned products; consequently, all inclusive safety measures to restrict mist concentrates likewise ought to be in place. (Lie and Leknes, 1985; Yukna *et al.*, 1997).

Many dental procedures which use mechanical instruments may create airborne particles from

place where instrument is used. Dental handpieces, ultrasonic scalers, air polishers and air blurred zone systems provide the clearest fog concentrates. Some of these instruments discharge material from such a accessible site that is aerosolized by action of such a spinning instrument, ultrasonic movements or the combined action of water treatments and compacted dust. Water shower is usually a piece of imploded water which is generally visible to the objective eye and is used by the patient as well as dental operators.

Quantitative and subjective analysis of dental aerosol chemicals can be extremely troublesome, and indeed the aerosol synthesis is likely to move to any patient and available location. In either case, it is fair to believe that sections with saliva, nasopharyngeal contaminants, plaque, blood, tooth segments or any substance used during the dental procedure, such as abrasive for tooth preparation and scaling, are all present in dental aerosols. Previously, the concentration usually concentrated on the amount of microbes found within dental aerosols; a few recent investigations have separated the similarity of blood components to dental aerosols (Barnes *et al.*, 1998).

In a wide variety of dental operations, the use of rubber dam can prevent any tarnishing from saliva and blood across all purposes. In fact, the use of a rubber dam is not appropriate for periodontal and scaling procedures such as root planing, periodontal surgery and routine prophylaxis (Checchi *et al.*, 2005). It is of particular concern due to the fact that periodontal operations are often carried out in the presence of blood and the instruments involved are prone for contamination (Jacks, 2002; Pippin *et al.*, 1987).

The dentists may not focus on a single disciplinary procedure. When dental aerosols are that, the main security layer is close to major safety barriers, such as head coverings, gloves and glasses. The second layer of defense is the regular use of a pre-procedural bactericide with a mouthwash, e.g. chlorhexidine. The third barrier stratum is the usual usage of a HVE by either the dominant wrist or attached to either the instrument being used. An extra layer of security may be the use of a gadget to reduce airborne defilement farther from the operating area, such as a HEPA tube (Jacks, 2002; Klyn *et al.*, 2001).

CONCLUSION

The awareness about harmful effects of aerosols is adequate among dental students. It is conceivable to limit the hazard with generally basic and rea-

sonable safety measures. Increased awareness initiatives and educational campaigns must be vigorously undertaken for the dental students to further enhance the understanding about all the preventive and corrective measures against the spread of aerosol contamination.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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