



Study of The Market Penetration of Superior Quality Infection Control Products Used In Dental Practice

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Abstract

A study was conducted among the Dentists of Ahmadabad to assess the infection control practices in Dentistry focusing mainly on sterilization and the use of Personal and Protective equipments (PPEs) so as to figure out the scope for superior quality infection products to be used in dental practice. The study procedure involves surveying dentists from 50 dental specialties and multispecialty hospitals which includes 36 males and 14 females. The data was collected by a predesigned and tested close ended questionnaire consisting of about 74 variables. The major observations were moderate level of awareness, mild level of usage and moderate level of preference towards superior quality PPEs. It appears to be a niche market for superior quality PPEs.

Keywords: Dentists, infection control, dental practice, dental hygiene

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Introduction

Dental hygienists practice in a highly contaminated environment the human mouth. The mouth contains bacteria and viruses from many sources. The saliva of a healthy patient contains large numbers of streptococci, staphylococci, and gram negative bacteria. While many of these organisms are relatively innocuous for a healthy person, they carry the possibility of infection for the increasing number of people with compromised immune systems [1].

Hygienists are more concerned about the pathogenic bacteria and viruses originating from non-salivary and non-tooth origins. These include organisms from the nasopharynx, sputum originating in the lungs, and blood routinely encountered during root planning. These areas are the sources of many pathogenic organisms such as tuberculosis (TB), hepatitis, human immunodeficiency virus (HIV), and severe acute respiratory syndrome (SARS).

Traditionally, the greatest danger inherent in dental aerosols was TB. In the past, TB was considered an occupational hazard for dentistry. In certain populations such as recent immigrants, prisons, and the homeless there is a much higher prevalence of TB. Hygienists working with patients from these groups need to approach treatment with great care due to the potential for undiagnosed TB [2-4].

In private clinical practice, the greatest danger comes from viruses harbored in the nasopharynx and blood particles arising from the operative site. Many viruses are present in the mouth originating from the saliva, gingival tissues, and from the nose, throat, and lungs.

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These include the common cold, influenza, and herpetic viruses [3].

The greatest current concern is the severe acute respiratory syndrome (SARS) virus. SARS is apparently caused by a coronavirus similar to the viruses that cause the common cold. Hygienists have a 60% higher incidence of cold symptoms than a similar professional group without dental patient contact. A risk of coronavirus transmission between patient and practitioner may exist. The Center for Disease Control and Prevention (CDC) and the ADA have recommended that all procedures generating aerosols be avoided in the presence of SARS because it can be spread by contaminated aerosols [1, 2]. Because a patient with active SARS is extremely ill, it is unlikely that any dental procedures would be performed. Due to this potential risk, as with HIV, hygienists should follow universal precautions for aerosols on the assumption that all patients carry an infectious disease that can be spread by an aerosol route [3].

Thus, infection control becomes extremely important in Dentistry as Both Patient as well as Dental health care personnel is exposed to pathogens; and contact with blood, oral and respiratory secretions, and contaminated equipment occurs [4-6].

Thus, Health organizations have developed guidelines to prevent or minimize threat to dental team's health among which, the use of Personal Protective Equipments (PPEs) and Sterilization are of critical importance.

Latex Hypersensitivity

Latex Hypersensitivity result from exposure to accelerators and other chemicals used in the manufacture of rubber gloves (e.g., natural rubber latex – NRL) [7].

Natural rubber latex proteins responsible for latex allergy are attached to glove powder. When powdered latex gloves are worn, more latex protein reaches the skin. In addition, when powdered latex gloves are donned or removed, latex protein/powder particles become aerosolized and can be inhaled, contacting mucous membranes. As a result, allergic patients and DHCP can experience cutaneous,

respiratory, and conjunctival symptoms related to latex protein exposure. DHCP can become sensitized to latex protein with repeated exposure [8-10].

Latex allergy (type I hypersensitivity to latex proteins) can be a more serious systemic allergic reaction, usually beginning within minutes of exposure but sometimes occurring hours later and producing varied symptoms. More common reactions include runny nose, sneezing, itchy eyes, scratchy throat, hives, and itchy burning skin sensations. More severe symptoms include asthma marked by difficult breathing, coughing spells, and wheezing; cardiovascular and gastrointestinal ailments; and in rare cases, anaphylaxis and death.

However, the ultrasonic scaler and the air polisher are the greatest producers of small particle aerosol contamination in dentistry. Several studies show that the ultrasonic scaler produces more airborne contamination than any other instrument in dentistry. The use of these instruments places hygienists at the forefront of risk for the airborne transmission of infections. The risk of infection occurs when these instruments are used on a patient and the visible aerosol mixes with the invisible microorganisms that arise from the patient [11-13].

This is true no matter what type of ultrasonic scaler or scaler tip is used. The use of ultrasonic and sonic vibration in the presence of a liquid, i.e., blood, aerosolizes the liquid. Whatever blood borne infection the patient may carry is probably present in the dental aerosols from root planning with an ultrasonic scaler [13-15].

The aim of the study is to understand infection control practices and the use of Personal Protective Equipments (PPEs) for infection control amongst the dental practitioners. The study also aimed at assessing their awareness about superior quality infection control products & their willingness to the same.

Materials and Methods

A questionnaire was prepared which was administered to the practicing dentists in the city

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of Ahmadabad after informed consent. Convenience sampling method was used. The samples size was 50. Sampling unit were Dental Multi specialties/Dental Clinics/Hospitals of Ahmadabad (Gujarat).

The secondary data was collected from relevant articles published in scientific journals and text books, reports published and websites. Analysis and data interpretation was done by SPSS software.

General Findings

- I. *Demographics* – 72% of respondents were males and 28% were females. 64% of respondents were in the age bracket of 25-35 years.
- II. *General Information*
 - a. 82% were BDS and 18% MDS Doctors. All the respondents were sterilizing the equipments in their own set up only, no outsourcing. 40% of respondents sterilized their instruments using Autoclave, boiling water as well as chemical sterilization, and 26% of respondents used only autoclave for sterilization. 46% followed the infection control guidelines of WHO, 8% of OSHA, 32% others and 14% followed no specific guidelines.
- III. *Personal and Protective Equipments (PPEs)*
 - i. Medical Gloves 80% use latex gloves and 20% use non latex gloves. 74% use powdered gloves and 26% use powder free gloves.
 - ii. Facemasks 84% of respondents use disposable facemasks, 8% reusable and remaining 8% both. 62% use facemask with ear loop, 24% facemask with tie band and 14% use both the types of facemask.
 - iii. Protective Clothing 70% of respondents were using Protective Clothing, out of which 32% were using Disposable Clothing and 38% were using Reusable ones. 26% of respondents were using clothing made up of linen, 18% were using Plastic clothing and 26% were using surgical ones. 20% of respondents would prefer online purchase of Protective clothing.

Discussion

Awareness of superior quality infection control products

The study highlighted that about 56% of respondents were aware of nitrile gloves or have at least heard of it, 50% of respondents were aware of water proof or fluid resistance facemasks (In spite of being highly prone to splashing), and around 40% of respondents were aware of Scrub Suits. Showing moderate level of awareness.

Usage of superior quality infection control products

It was observed that only 20% of respondents were using Non Latex Gloves, 74% of respondents were using Latex Powdered Gloves (which increases the risk of Latex Hypersensitivity), only 16% of respondents were using N95 facemasks (that too along with other facemasks), 12% of respondents were using High level/Moderate level/Low level Fluid Resistance facemask and 32% of respondents were using disposable protective clothing. Preference towards superior quality infection control products.

Readiness towards online purchase of PPEs: The younger brigades of dental practitioners were more interested into online purchase of PPEs. While according to other dental practitioners online purchasing of PPEs is not a safe and reliable option in terms of quality.

Conclusion

It is concluded that there was a good level of preference towards superior quality infection control products among the dental practitioner as it was found that 62% of respondents said that they would not only prefer to use standard gloves but also would like to switch over to such standard gloves

The study concluded that there is Niche Market for Superior quality infection control products. Low cost, uncertified, sub-standard products (that decrease the safety levels of personnel and erode the market share of certified PPE manufacturers) currently dominate the market. The younger group of dentists prefers online purchase of superior quality infection control products.

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