

Biosafety in dentistry: literature review**Biossegurança em odontologia: revisão de literatura**

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ABSTRACT

Some infections are directly linked to dental practice, in which dental surgeons are exposed to a wide variety of microorganisms present in patients' oral and body fluids. Biosafety is a multidisciplinary science that emphasizes actions to prevent, reduce or eliminate risks inherent to the activity. The purpose of this literature review is to identify the main forms of transmission of infectious diseases, locate common errors regarding the set of conducts and technical measures employed by dental professionals, describing the complications resulting from failures in the protection mechanisms as well as demonstrating the evolution of biosafety in the last twenty years and its relation to the clinical-dental scope. To carry out this study, 19 scientific articles published between 1999 and 2019 were searched, with the descriptors: Contamination of biological risks; Dentistry; Communicable diseases. Articles in Portuguese and English were filtered in the GOOGLE ACADÊMICO, SCIELO, BIREME, LILACS databases. The results demonstrate the importance of the dentist's knowledge of the risk of cross-contamination, in addition to compliance with biosafety standards in public and private institutions.

Keywords: Containment oh Biohazards; Dentistry; Communicable Diseases.

RESUMO

Algumas infecções estão diretamente ligadas à prática odontológica, no qual cirurgiões-dentistas estão expostos a uma ampla variedade de microrganismos presentes nos fluídos orais e corporais dos pacientes. A biossegurança é uma ciência multidisciplinar que dá ênfase às ações de prevenção, diminuição ou eliminação dos riscos próprios à atividade. O objetivo desta revisão de literatura é identificar as principais formas de transmissão de doenças infectocontagiosas, localizar erros corriqueiros quanto ao conjunto de condutas e medidas técnicas empregadas por profissionais da odontologia, descrevendo as complicações resultantes de falhas nos mecanismos de proteção bem como demonstrar a evolução da biossegurança nos últimos vinte anos e sua relação ao âmbito clínico-odontológico. Para realização do presente estudo, foram pesquisados 19 artigos científicos publicados entre 1999 e 2019, com os descritores: Contaminação de riscos biológicos; Odontologia; Doenças transmissíveis. Foram filtrados artigos em português e inglês nas bases de dados do GOOGLE ACADÊMICO, SCIELO, BIREME, LILACS. Os resultados demonstram a importância do conhecimento do cirurgião-dentista sobre o risco de contaminação cruzada, além do cumprimento de normas da biossegurança em instituições públicas e privadas.

Palavras-chaves: Contenção de Riscos Biológicos; Odontologia; Doenças Transmissíveis.

1 INTRODUCTION

Biosafety is a new multidisciplinary science that emphasizes prevention actions, reduces or reduces the risks of activity. The care inherent in dental practice adopts as imprudence regarding the transmission of infections through direct, indirect, air or parenteral contact.¹

In Brazil, biosafety was structured after the 1970s and 1980s, legislation was legally formatted only for processes involving genetically modified organisms.²

Concern about biosafety has become very important in the dental field, as the outbreaks of various infectious contagious diseases have been emerging. Infection-causing microorganisms exist in these environments and proliferate very easily.³

It is essential that dental surgeons (DSs) regularly update their knowledge of biosafety mechanisms. In dentistry it involves a sequence of steps to be performed rather than complex reasoning and difficult techniques to perform.⁴

Dental professionals are often unaware of, or even do not care about, basic care, but these infections can simply be prevented, thus stopping their spread.⁵

Some infections are directly linked to dental practice. CD's are exposed to a wide variety of microorganisms present in patients' oral and body fluids.⁶

The use of Personal Protective Equipment (PPE) is intended to prevent bacteria from patients through the oral cavity, blood, saliva and excreta from contaminating the professional and their staff. PPE's include gloves for each procedure, lab coat, hat, mask and goggles. Protective masks should be changed between each patient.⁷

Knowledge about the biosecurity standards universally adopted by dental surgeons is necessary to control various pathologies that can be transmitted through direct and indirect contact with patient and staff secretions. Given this, it is extremely important that periodic updates are made.

The purpose of this literature review is to identify the main forms of transmission of infectious diseases; locate the common errors regarding the set of conducts and technical measures employed by dental professionals; describe the complications resulting from the failure of the protection mechanisms; show the evolution of biosafety in dentistry in the last twenty years; to present the advancement of the application of biosafety norms in relation to the clinical-dental scope.

2 METHODOLOGY

The methodology used for the elaboration of this scientific article was based on a literature review, based on the biosafety theme in dentistry. For the research, scientific articles were searched in the databases of GOOGLE ACADEMIC, SCIELO, BIREME, LILACS, using a time period from 1999 to 2019.

3 LITERATURE REVIEW

The safe practice of dentistry requires knowledge related to the most varied procedures, especially with situations considered at risk, which are those that can cause the transmission of infections between patients and professionals, including: contact with saliva, blood, other types of fluids, injuries. caused by a contaminated needle and / or sharp object.⁸

In this scenario, it is important to adopt basic prevention routines at work that promote the protection of staff, patients and the environment, minimizing the risk of transmission of microorganisms that cause infectious diseases.⁹

It is noteworthy that the causes of infections can be superficial, deep, localized or generalized. Considering that the chain of infection consists of the simultaneous union of four links of the chain of infection, namely, virulence, number of microorganisms, susceptible host and gateway, it is fully possible to interrupt the contagious process in any of these phases.¹⁰

In this line, infection control is determined by referral protocols from competent agencies such as the American Dental Association (ADA), Centers for Disease Control and Prevention (CDC), and others. The Dental Infection Control Protocol is divided into 5 parts: standard precautions, disinfection, physical barriers, radioprotection and sterilization center.¹¹

Regarding standard precautions, such attitudes should be followed in each care, that is, in every patient change, namely: hand hygiene, simple but indispensable measure to prevent infections; use of PPE, such as hat, goggles, mask, gloves, lab coat and closed shoe; immunization against influenza, hepatitis B, tetanus, diphtheria, chickenpox etc.¹²

Regarding decontamination / disinfection, such conduct is identified by levels: high, intermediate and low. High level disinfection refers to the elimination of spores. Intermediate level decontamination acts against vegetative microorganisms and fungi, while low level disinfection acts inactivating some types of fungi and viruses.¹³

In the decontamination process, it is important to clarify the classification of Spaulding. The articles have three categories: a) Critical - which are surgical instruments used to penetrate the tissue, such as forceps, suckers, probes and drills and must be autoclaved; b) semi-critical - amalgam mirrors and condensers that touch but do not penetrate the oral tissues and should also be autoclaved; c) non-critical - these are instruments that do not touch or penetrate fabrics such as furniture and countertops and must be disinfected with 70% alcohol.¹⁴

In addition, there is surface disinfection, which is also essential for infection control and must be performed at points of direct or indirect contact by the action of aerosols, splashes and sprays during care.¹⁴

Physical protective barriers prevent cross-infection and should be changed at each visit. Cross contamination occurs through various surfaces, such as chair buttons, high-speed pens, focus protector, triple syringe, so these surfaces should be wrapped with PVC film, disposable straws, bags and the like.¹⁵

Radioprotection is one of the steps that studies show to be one of the most overlooked by dental surgeons. This dental equipment must contain the lead apron and thyroid protector for the patient; moreover, for the practitioner, adequate conditions for revealing radiographs.¹⁵

It is essential to emphasize that the instruments must be resigned to the disinfection and sterilization processes. Instrument asepsis must be performed prior to the washing process in order to reduce infection. Immediately afterwards, the instruments are washed in order to avoid organic material. Drying is a step that cannot be overlooked and is done with paper towels and air jets. Designated as a barrier or packaging for sterilization, it is intended to ensure that the instrument is sterilized and sterile until its next use.¹⁶

Transmission of infectious disease occurs directly from one host to another, from person to person; indirect, objects to person; airway, usually by bacteria or virus droplets and parenterally, by blood, food, water and fecal-oral. In dental practice, transmission can occur from patient to dental team, from team to patient, patient to patient, from clinic to community, and from community to clinic. As a result, cross infection appears, which has contaminated blood, saliva and instruments as transmission vehicles, as well as inhalation, ingestion and inoculation as transmission routes.¹⁷

Infection control is paramount. In the dental clinic, vaccination is considered one of the most important measures to prevent the acquisition of infections. It has been recommended for dentists as well as dental assistants and technicians.¹⁸

The measures adopted serve as support to control the infections in order to prevent the transmission, since there are a large number of transmitting microorganisms of various pathologies. Basic care such as the aforementioned are helpful not only in the prevention but in the control of these diseases.¹⁹

4 CONCLUSION

There is a routine concern to warn the dental surgeon about the importance of compliance with biosafety in dental offices, such as compulsory use of PPE, inspection of sterilization methods and mandatory immunization in public and private institutions. Dentistry teachers and students should be well informed as they are often exposed to biological and

chemical hazards that may compromise the integrity of the professional, patient and the entire work team.

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