

Evaluation of Knowledge About Disinfection of Dental Impressions in Several Dental Schools

Avaliação do Conhecimento Sobre a Desinfecção de Moldes em Diversas Escolas de Saúde

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ABSTRACT

Objective: Evaluate the knowledge of students and professors in five public and private dental schools, considering the need and methods of disinfections of impressions. **Material and method:** Data were collected through questionnaires composed de descriptive and multiple choice questions, answered for 201 students and 27 professors. **Results:** The first part of the questionnaire revealed that 66.17% of the students and 81.48% of the professors realize routinely disinfection. Among these professors, 48.15% affirmed that received training about this subject and 59.26% answered that it is emphasized in the schools they teach. The disinfectant solutions reported to be the most effective were: 2% Glutaraldehyde, 1% Sodium Hypochlorite and Chlorhexidine. It was observed that the most of students pre-

sented difficulties about questions of disinfection methods of impression materials. The answers of teachers and students did not present a standard knowledge about this subject. In general, professors from the same institution showed different approach for the same questions. Second part of the questionnaire showed high level of non-answered questions. **Conclusion:** It was concluded that, in spite of being aware of the need of disinfection, students presented difficulties to execute the procedure. It was observed no standard behavior among professors from the same institution, so this student showed that is very important to create a protocol and to make it clearer and accessible to students.

KEYWORDS: Infection control, dental education, dental impression materials, disinfection.

INTRODUCTION

AIDS, Hepatitis, Herpes and Tuberculosis can affect a lot of segments from world society, in special health professionals due the cross-infection¹⁻⁴. In Dentistry, this concern is well established, because during the clinical procedures, clinicians and their assistant are exposed to pathogens, through materials and contaminated instruments⁵. Then, the use of mechanical barriers such as gloves, hats, masks⁶, safety glasses, aprons, as well as the disinfection of surfaces and instruments sterilization, are basic procedures in the norms of biosecurity. These procedures have obligatory character in the practice of actual Dentistry⁷. These preventive rules must be adopted by Universities and Technical Health Schools, so they may be part of the routine of students on the under-graduation program. In this way, these institutions will graduate aware and also well prepared professionals for the work market, with their behavior based on the scientific knowledge.

Dental impressions can transmit serious diseases to dental staff, because they are in contact with saliva and blood from

the patients and they can transfer microorganisms to the stone casts^{1, 8-11}. Some of these microorganisms survive by a very long time, even when they are outside the mouth fluids, then this is a potential health risk¹². In this way, all impression must be disinfected before being sent to prosthetic laboratories or by the time they arrive there, avoiding the spread of cross-infection¹³.

Although it is a simple procedure, the disinfection of the dental impressions must be done carefully. The selection of the disinfection agent is very important, because it must have wide action spectrum without altering the physic-chemistry properties from the impression materials¹⁴⁻¹⁶. Others factors, as concentration, compatibility and also time of disinfection to each impression materials are also very important in this procedure¹⁷. Several studies have been done in order to evaluate possible adverse effects caused by disinfection of the impressions (Board 1), but many of them prove that if no phase is neglected, the procedure will not have clinical alterations^{18, 19-21, 23-25}.

The awareness of professionals involved in the cycle of cross-contamination, must be part of the undergraduate curriculum

Board 1. Literature Review to questionnaires elaboration and collected information

References	Impression Materials	Disinfection Solution	Method
Herrera et al., 1986 (18)	Irreversible hydrocolloid, Polyether, Polysulfide, Addition Silicone	0,5 and 1% NaOCl, Iodophor, 2% Glutaraldehyde	Immersion 30 minutes
Tullner et al, 1988 (16)	Irreversible hydrocolloid, Polyether, Polysulfide, Addition Silicone	0,5 NaOCl, Iodophor, 2% Glutaraldehyde	Immersion 15 minutes
Kaplan et al, 1994 (3)	Irreversible hydrocolloid	2% Glutaraldehyde	Immersion 10 minutes
Lepe et al, 1997 (19)	Polyether, Addition Silicone	2% Glutaraldehyde	Immersion 18hs
Johnson et al, 1998 (2)	Irreversible hydrocolloid, Polyether, Addition Silicone	Iodophor, Phenol Glutaraldehyde	Immersion 10 minutes
Lepe et al, 2002 (20)	Polyether, Addition Silicone	2% Glutaraldehyde	Immersion 30 minutes
Taylor et al, 2002 (15)	Irreversible hydrocolloid	1% NaOCl	Immersion 10 minutes
Silva et al, 2004 (11)	Condensation Silicone	1% NaOCl, 2% Glutaraldehyde	Immersion 10 and 20 minutes
Porta et al, 2006 (21)	Irreversible hydrocolloid, Zinc oxide-eugenol Paste	1% NaOCl, 2% Glutaraldehyde, 0,5% Chlorhexidine	Immersion 10, 30 and 60 minutes
Yilmaz et al, 2007 (22)	Polyether	0,525% NaOCl, 2% Glutaraldehyde	Immersion 10 minutes
Kotsiomiti et al., 2008 (23)	Literature Review: various combinations of impression material/disinfecting solutions were encountered. Immersion and spray were also investigated.		
Kronstrom et al., 2010 (24)	Addition Silicone, Polyether, Ring-Opening metathesis polymer	15-18% Álcool isopropílico; 2.5% Glutaraldehyde	Spray 10 minutes; Immersion 90 minutes
Hiraguchi et al., 2010 (25)	Irreversible hydrocolloid	1% NaOCl, 2% Glutaraldehyde	Spray 3 hours

of Universities and Technical Health Schools, in order to protect the dental staff and also the patients. Therefore, it is very important evaluate the knowledge of professors and students, future health professionals, through the situations that offer contamination risk. The aim of this study was to evaluate the knowledge of students and professors in five public and private dental schools, considering the need and methods of disinfections of impressions.

MATERIAL AND METHOD

For the development of this research, some questionnaires were done based on literature review in database PUBMED and LILACS-BIREME between the years 1972 to 2010, trying to know the most indicated disinfection agents to each impression materials (Board 1) .

The questionnaire was divided in two parts: the first included descriptive questions, to evaluate if the interviewed ones really knew the answers of the questions or if they were influenced by the alternatives; and the second part of it, which had the same questions but now it also had multiple choice alternatives (Figure 1). The questionnaires were collected after participants

had signed an informed consent, in accordance with the ethics committee of Federal University of Uberlandia, Brazil (protocol #064/06). The data were collected from various schools (federal, state public schools and private dental schools): Dental School at Federal University of Uberlandia, Brazil (FOUFU), Dental School at University of Uberaba, Brazil (UNIUBE) and Piracicaba Dental School at University of Campinas, Brazil (UNICAMP), and also to the students of the 2nd year of the Dental Prosthesis Technical from Health School at the Federal University of Uberlandia (ESTES-UFU) and FOP-UNICAMP. An informative discussion was initiated with the deans of each institution, followed by class visits to invite students and professors to participate in the study. It was stipulated by the authors that the interviewed ones should be at least on the 6th period of Dentistry, as in general, the students begin practical activities of attending patients on the 5th or 6th period.

All questionnaires were applied by only one operator, who was always present during the filling out the forms, to avoid variations on the data-base collection. The students, whenever possible, were interviewed collectively, while the professors were interviewed individually. The collected data was analyzed by descriptive statistics and presented in frequency tables.

RESULTS

In this analysis, we included 201 students and 27 teachers, and the information obtained in the questionnaires is presented on Tables 1-3 and Figures 2 and 3.

In the first part of the questionnaire, most of the students presented difficulties in answering questions concerning the description of disinfection methods used in different impression materials. These questions, in general, showed a wide variety of answers and did not demonstrate homogeneity of techniques, not even among the students and professors from the same ins-

titution. The type of the disinfectant mentioned by most of the professors as the most efficient ones were 2% glutaraldehyde, 1% sodium hypochlorite and chlorhexidine.

The second part of the questionnaire, related to the multiple-choice questions, was answered by 27 professors (Table 2) and 191 students (Table 3). The students had more facility to answer this part of questionnaire than the first, with an evident reduction of the answers in blank. The responses of the students were divergent on the most appropriate solution for each impression material. Moreover, the students marked as an option, solutions that were not in agreement with the literature review, such as 70 alcohol and chlorhexidine. Comparing the professors and the students' answers, it is seen that the ideas are more coherent to the second part of the questionnaires when compared to the descriptive questions. However, not even professors from the same institution have presented well-established ideas related to this topic.

Table 1. Students and professors according to the institution

COURSES					
	Graduation in Dentistry		Dental Prosthesis Technical		
SUBJECTS	FOU FU (%)	FOP-UNICAMP (%)	UNIUBE (%)	ESTES-UFG (%)	FOP-UNICAMP (%)
Students	76 (37.81)	42 (20.90)	41 (20.40)	19 (9.45)	23 (11.44)
Teachers	15 (55.55)	05 (18.52)	04 (14.81)	-----*	03 (11.11)

* Due to the reduced number of teachers on this institution, beyond the participation of two of them on the research, it was not possible to distribute the questionnaires

Table 2. Data collected in multiple-choice questionnaires answered by professors (*QW= questions not answered)

Disinfection Form					
	70 Alcohol (%)	1% Sodium Hypochlorite (%)	2% Glutaraldehyde (%)	Chlorhexidine (%)	QW (%)
Question 1	0	14 (51.85)	9 (33.33)	2 (7.41)	2 (7.41)
Question 2	0	9 (33.33)	11 (40.74)	5 (18.52)	2 (7.41)
Question 3	0	9 (33.33)	11 (40.74)	5 (18.52)	2 (7.41)
Question 4	0	12 (44.44)	8 (29.63)	5 (18.52)	2 (7.41)
Question 5	0	10 (37.04)	8 (29.63)	4 (14.81)	5 (18.52)
Question 6	1 (3.70)	8 (29.63)	6 (22.22)	5 (18.52)	7 (25.93)
Question 7	0	9 (33.33)	5 (18.52)	5 (18.52)	8 (29.63)

Table 3. Data collected in multiple-choice questionnaires distributed to students (*QW= questions not answered)

Disinfection Form					
	70 Alcohol (%)	1% Sodium Hypochlorite (%)	2% Glutaraldehyde (%)	Chlorhexidine (%)	QW (%)
Question 1	6 (3.14)	73 (38.22)	73 (38.22)	19 (9.95)	20 (10.47)
Question 2	7 (3.66)	45 (23.56)	78 (40.84)	39 (20.42)	22 (11.52)
Question 3	12 (6.28)	47 (24.61)	62 (32.46)	47 (24.61)	23 (12.04)
Question 4	25 (13.09)	55 (28.80)	57 (29.84)	32 (16.75)	22 (11.52)
Question 5	12 (6.28)	48 (25.13)	53 (27.75)	51 (26.70)	27 (14.14)
Question 6	18 (9.42)	55 (28.80)	50 (26.18)	42 (21.99)	26 (13.61)
Question 7	33 (17.28)	42 (21.99)	40 (20.94)	47 (24.61)	29 (15.18)

For the need of forming aware professionals, ethics and critics, the course of Universities and Technical Health Schools, must have its pedagogical project (curriculum and complementary activities) collectively built, focusing on the student as a subject of learning and supported by the professor as a facilitator in the learning-teaching process²⁶.

Results have revealed that most of the professors (66.17%) and students (81.48%) have done the disinfection of the dental impressions (Figure 2). However, there are still a considerable number of these, who have not executed such procedure, so it is a factor of worry facing the possibility of getting several diseases through the manipulation of contaminated material⁵. Besides, if the students do not understand the real importance of preventing cross-contamination in the moment of their formation, probably they will not adopt control measures when they are in their clinical office.

The information from Figure 3 shows the number of professors who have received specific training on disinfection of the impressions. It is observed that this is inferior to those ones who have not received any training in three of the researched institutions. The relevance of this data leads to a reflection of the importance of institutional projects, focusing on crossed infections, such as poster, campaigns and awareness annual dates. The same data suggests that the knowledge not obtained by professors tend not also be transmitted to students, or will be in a wrong way. So, professors need receive complementary instructions about controlling norms of infection in order to teach, through words and attitude, the biosecurity correctly²⁷.

The instruction in regard to disinfection techniques it is still much little practiced in offices and prosthetic laboratories¹⁷, so, there is a need of implementing notions of biosecurity, not only in Dental Schools, but also in the curriculum of Health Technical School⁸, improving the quality of life and reducing the risk of future problems with contaminated impressions and stone casts.

The second part of the questionnaire (Table 2) showed that the number of questions, which were not answered (blank questions) by professors, was more expressive when related with the materials: zinc oxide-eugenol paste, godiva and to the wax rolls. This high level of doubt was not observed on the other questions, with more homogeneity in answers, like the use of 2% glutaraldehyde and 1% sodium hypochlorite, in accordance with information collected in literature, which suggest that solutions as the most indicated ones for disinfection of impressions. The results of this study also suggest that the students (Table 3) had more facility in answering the multiple choice questions, indicating that they were inducted by the presented alternatives. This justifies the use of two forms of questionnaires for this research, making possible the evaluation of the real knowledge of these students.

Nowadays, in the context of universal precaution, it is important to consider impressions and stones as an eminent risk of contamination. To eliminate possible contamination, infection control programs must to be recommended to Universities and Technical Health Schools. So, it is necessary to rethink the teaching-learning process, on the aspects of programmatic con-

tents and also the teaching processes²⁸. In this way, obligatory infection control courses and guidelines for professional graduation is an important strategy to care-disease-health process²⁶. However, the biggest challenge is presented ideas and knowledge in an articulated and integrated way, with the concept of mandatory continuing education that includes a specific component on infection control.

CONCLUSION

In the limitations of this study and based on the followed methodology and facts analysis, it can be concluded that:

There is an important divergence related to the thought of professors and students when the subject is disinfection of the impressions, not having connection between the transmitted and acquired teaching;

There is no pattern of contents and thoughts related to the researched subject among the institutions and inside them.

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RESUMO

Objetivo: Avaliar conhecimento de alunos e professores em cinco instituições de ensino, considerando necessidade e técnicas de desinfecção de moldes. **Material e método:** Os dados foram colhidos por meio de questionários compostos de questões discursivas e de múltipla escolha, respondidos por 201 alunos e 27 professores. **Resultados:** A primeira parte do questionário revelou que 66,17% dos alunos e 81,48% dos professores realizam rotineiramente desinfecção. Entre esses professores, 48,15% afirmaram ter recebido treinamento sobre o tema e 59,26% responderam que é enfatizado nas escolas que lecionam. As soluções desinfetantes relatadas como mais eficazes pelos participantes foram: glutaraldeído 2%, hipoclorito de sódio 1% e clorexidina. Observou-se que a maioria dos alunos apresentava dificuldades em responder às questões relativas à descrição da técnica de desinfecção, para diferentes materiais de moldagem. Constatou-se que as respostas de docentes e discentes quando comparadas não apresentavam padronização de conhecimento sobre este assunto. No geral, professores de mesma instituição demonstraram pensamentos divergentes sobre questões similares. Em relação à segunda parte do questionário, mesmo apresentando alternativas, o índice de questões não respondidas foi alto. **Conclusão:** Apesar de estarem conscientes da necessidade de desinfecção, os alunos apresentaram dificuldades para executar o procedimento. Não foi observada padronização de idéias entre professores de mesma instituição, havendo assim a necessidade de elaboração de protocolo e torná-lo mais claro e acessível aos alunos.

PALAVRAS-CHAVE: Controle de infecção, educação odontológica, impressão de materiais dentários, desinfecção.

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