



An Epidemiological Study of the Decontamination of Impressions and Prosthetic Appliances

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Abstract

Background: To minimize the risk of cross-contamination in the prosthetic practice in dental offices, the decontamination of the entire prosthetic chain is essential. We conducted a survey of dental offices in the city of Casablanca, which aims to assess the practice of decontamination during the performance of prosthetic work.

Material and Methods: To achieve our purpose, an epidemiological investigation was conducted among 308 dentists of the city of Casablanca using an anonymous questionnaire.

Results: The participation rate in our study was 62%, and revealed that only 34% of dentists decontaminate impressions before sending them to the laboratory, and 62.8% decontaminate fittings and prostheses before placing them into the mouth. 77% of dentists in our sample are not trained in impression's decontamination and 84% do not know the specific decontamination protocol of each material. This shows that there is a concordance between the practice of the decontamination of prosthesis and initial trainings. In our study, 12% of the practitioners do not use any protective measures when decontaminating impressions and the majority of practitioners are vaccinated against hepatitis B with a percentage of 75%, followed by 41% against tuberculosis, 10% against influenza and 22% have not received any vaccination.

Conclusion: The practice of the decontamination of impressions and prosthesis work is not respected by the majority of Moroccan dentists working in the private sector in the city of Casablanca, and there is an underestimation of the risks incurred by transmissible diseases through prosthetic works going from the office to the laboratory and vice versa.

Keywords: Decontamination; Impressions; Prosthetic Work; Cross-contamination

Introduction

Prosthetic practice in the dental office requires communication with a prosthetic laboratory, which increases the risk of cross-contamination by the transmission of pathogenic microorganisms between the patient, the dentist, the assistant and the laboratory technicians. This contamination problem occurs throughout the prosthetic chain from the impression, which represents a major

potential source of infection in prostheses, to the prosthetic realization [1]. This impression is contaminated by oral fluids, mainly: saliva and blood, which may contain pathogenic microorganisms, [1] that can cause infectious diseases such as: pneumonia, tuberculosis, herpes, hepatitis B and C, AIDS [2].

Precautionary measures taken by dental offices and prosthetic laboratories will prevent or minimize cross-contamination

[3]. They are essentially based on the decontamination of the prostheses during all the stages of prosthetic realization. These same measures should be taken in all patients regardless of their known or suspected infectious status, as some do not reveal their infectious status and many do not know if they are infected. Therefore, any patient should be considered as a patient at potential risk of contamination [2-5].

We conducted a survey of dental practices in the city of Casablanca, which aims at evaluating the practice of decontamination during the performance of prosthetic work.

Material and Methods

To achieve our objective, a descriptive epidemiological survey was conducted among 308 dentists practicing in the city of Casablanca using an anonymous questionnaire designed on the basis of information collected in the scientific literature. It consists of 4 pages and 22 questions, the majority of it have predetermined answers to simplify the completion of the document. The questionnaire has 7 components:

Identification, work methodology, communication between the dental office and the prosthetic laboratory, impression processing, disinfection of prosthetic work, trainings and knowledge in the field of decontamination and personal protection.

A pre-survey was carried out with 5 professors from the Faculty of Dentistry of Casablanca and 5 private dental practices, in order to ensure the validity of the content of the questionnaire and the understanding, clarity, precision and acceptability of the questions. The questionnaire was subsequently modified based on the informations collected.

Data entry was performed using Microsoft Excel 2010 software, and statistical data analysis was performed using Python computer software (a popular programming language in data analysis).

Results

Out of 308 questionnaires distributed, we managed to recover 191, the participation rate was 62%. The study population of private sector dentists practising in the city of Casablanca is predominantly female, at 65%. (n = 124). 55% of the dentists in our sample had 10 years or more of experience, 19% were between 5 and 10 years old and 25% had less than 5 years of practice.

68% (n = 128) of dentists notify infectious risk patients to the laboratory.

69% (n = 88) of dentists who notify infectious risk patients to the prosthetic laboratory specify the disease.

Regarding to the decontamination of impressions, only 34% (n = 66) of dentists use a disinfectant for impressions, 63% (n = 121) use water-rinsing only and 3% (n = 6) send impressions to the laboratory directly without rinsing as shown in figure 1.

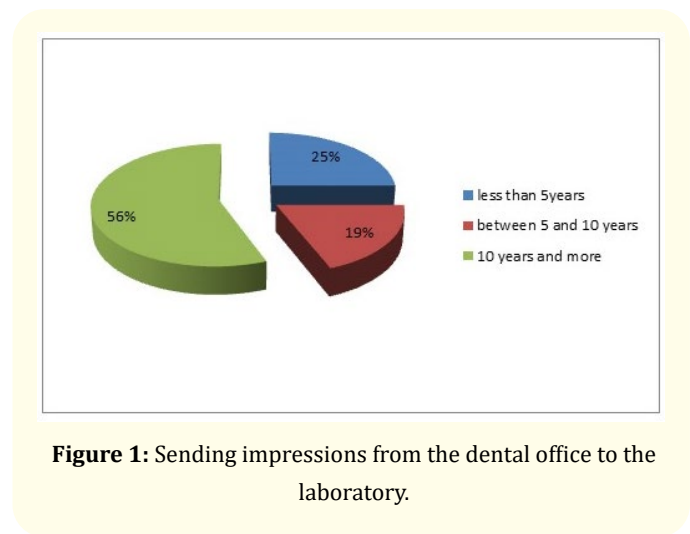


Figure 1: Sending impressions from the dental office to the laboratory.

Concerning the decontamination product used, our study showed that:

- 87% of practitioners use running water
- 43% use sodium hypochlorite,
- 43% use alcohol
- And 31% use aldehydes.

48.5% of 66 dentists who disinfect their impressions use immersion, 44% use spraying and 7.5% use both spraying and immersion.

The average decontamination time for our dentists is less than 10 minutes for 60% of the practitioners among 36 dentists who answered the question, between 10 and 30 minutes for 26% of the dentists and more than 30 minutes for 14% of them.

77% (n = 146) of the dentists in our sample are not trained in decontamination of impressions.

The results of the practice of the impression’s decontamination and of the decontamination trainings are statistically significant because 100% of practitioners who send impressions directly without rinsing are not trained in decontamination.

As described in Figure 2, 67% of practitioners who use only water with the decontamination product are trained in decontamination and 82% of dentists who rinse impressions only with running water have not received any training in the decontamination of impressions.

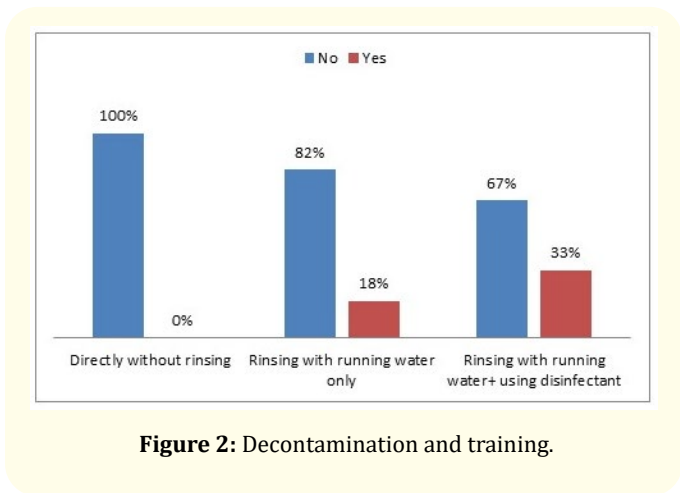


Figure 2: Decontamination and training.

There is also a concordance between the results of the practice of impression’s decontamination and years of experience, because among dentists with less than 5 years of experience: 58% of them send their impressions to the laboratory after rinsing with running water alone and none of them send their impressions to the laboratory directly without rinsing.

For dentists with between 5 and 10 years’ experience: only 27% send them after using a disinfectant in addition to water rinsing and 5% of this category send them directly without rinsing.

Dentists with more than 10 years of experience: 33% of these practitioners use a disinfectant after rinsing with water and 4% of them send them directly to the laboratory without rinsing (Figure 3).

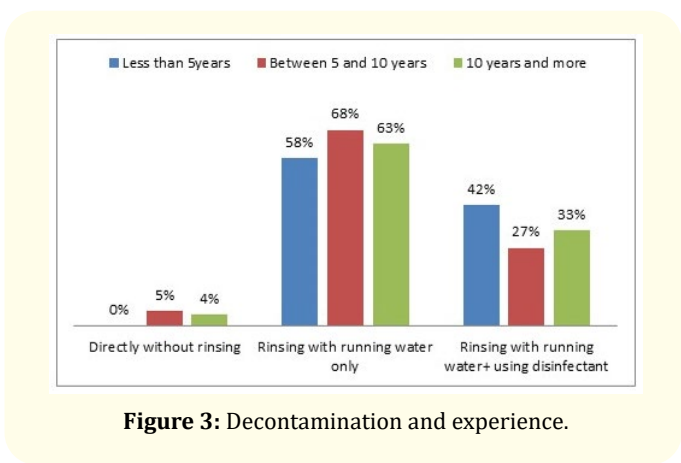


Figure 3: Decontamination and experience.

Concerning the decontamination of the prosthetic fittings and the final prosthetic works our study showed that 62.8% (n = 120) of the dentists in our study decontaminate the fittings and prostheses before placing them into the mouth and 37.2% (n = 71) of these practitioners place them directly in the mouth without decontamination.

57% (n = 109) of dentists do not know if the decontamination product affects the quality of the impression, 14% (n = 26) of practitioners believe that the disinfectant affects the quality of the impression and 29% (n = 56) believe that this product does not modify the properties of the impression.

As shown in Figure 4, 68% of practitioners who do not know if the decontamination product affects the quality of the impression don’t use a disinfectant and rinse the impressions only with running water.

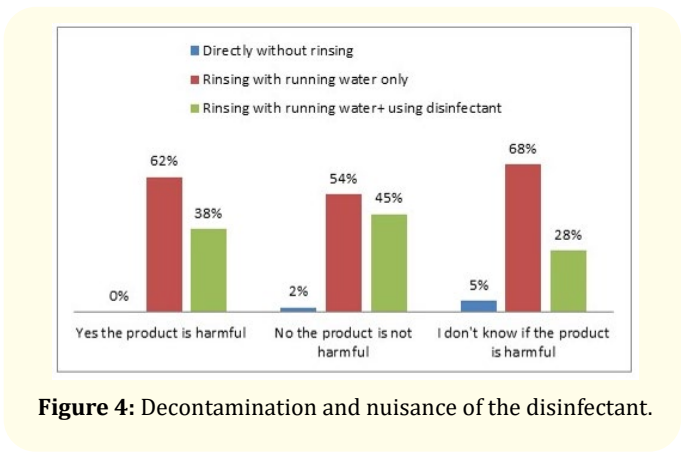


Figure 4: Decontamination and nuisance of the disinfectant.

62% of dentists who think that the disinfectant is harmful to the impression do not use it and are satisfied with rinsing with running water alone.

45% of dentists who believe that the decontaminant product does not alter the quality of the impression use it.

Concerning the use of protective measures when decontaminating impressions, our study showed that 12% (n = 22) of the practitioners in our study do not use any protective measures when decontaminating impressions.

Of the 169 dentists who use the means of protection, only 42% (n = 71) wear the full suit of protection (medical gloves, protective glasses).

Discussion

The majority of the dentists in this study have 10 years or more of experience with a percentage of 55%, followed by 25% of practitioners who have less than 5 years of practice, and finally 19% of practitioners have between 5 and 10 years of practice.

According to a similar study conducted in Pakistan [6], out of a sample of 51 dentists, 38 (74.5%) have 3 years or less experience, and 6 practitioners (11.8%) have between 3 and 10 years of experience and finally 7 dentists (13.7%) have 10 years of practice.

In our study, 68% of dentists report infectious risk patients to the laboratory and 62% of them specify the disease. According to a study conducted among dentists in the United Kingdom, among 77 responses, 31.3% of practitioners notify to the laboratory of infectious risk patients [7].

This shows that Moroccan dentists are aware of the need to notify communicable diseases to avoid cross-contamination, although they should not consider it necessary because according to the ADA, standard precautionary measures must be implemented, regardless of the patient's infectious status and this includes the dental impressions contaminated with blood and saliva [2-8].

The results of our study showed that only 34% (66 dentists out of 191) use a disinfectant for dental impressions. In their study conducted in the United Kingdom, Almortadi, *et al.* showed that out of a total of 78 dentists 74 decontaminate their impressions

[7]. Another study in Sweden showed that 50% of a sample of 83 dental practices disinfects impressions before sending them to the laboratory, while the other half rinse them with running water only [9].

Concerning the decontamination product used, our study showed that.

87% of practitioners use running water, 43% use sodium hypochlorite, 43% use alcohol and 31% use aldehydes.

There is a low use of the disinfectant by the dentists in our sample and we noticed that 43% use alcohol although it is not included in the list of disinfectant products for impression materials.

48.5% of 66 dentists who disinfect their impressions, immerse them in disinfectant solutions, 44% spray them and 7.5% use both spraying and immersion.

The average decontamination time for our dentists is less than 10 minutes for 60% of the practitioners among 36 dentists who answered the question, it is between 10 and 30 minutes for 26% of the dentists and more than 30 minutes for 14% of them. Our results are not consistent with what has been reported in the literature, as according to the literature, the decontamination time for impression materials is 10 minutes.

In order to explain the reason why dentists in the city of Casablanca are not concerned about the practice of impressions's decontamination, it has been shown that all practitioners who send their impressions directly without rinsing, i.e. a percentage of 100%, are not trained in decontamination, 67% of practitioners who use running water with the decontamination product are trained in decontamination and 82% of dentists who rinse impressions only with running water have not received training impression's decontamination. This explains that the absence of the practice of impression's decontamination by our dentists would be linked to a lack of training.

Our study showed that young, newly graduated dentists are the most concerned about the practice of impression's decontamination, as none of them send their impressions directly to the laboratory without rinsing.

Regarding to the decontamination of prostheses and fittings, our study revealed that 62.8% of dental doctors decontaminate the fittings and prostheses before putting them in the mouth and only 37.2% of these practitioners put them directly into the mouth without decontamination.

Our study showed that 57% of dentists do not know if the decontamination product affects the quality of the impression and 14% of practitioners believe that the disinfectant affects the quality of the impression.

This low use of the disinfectant could be explained by the fear of deteriorating the physicochemical properties of the impressions, which explains the lack of knowledge of the physicochemical properties of the impression materials, and therefore, the gaps in the training curriculum.

The results obtained in our study show that 88% of practitioners protect themselves during the process of decontamination, but only 42% of them wear the full outfit. According to the ADA, the handling of soiled objects requires dentists to wear standard precautions [2].

Conclusion

Decontamination during prosthetic practice is essential to avoid any risk of cross-contamination.

Thus, a good knowledge of disinfectant techniques and products is necessary.

Our study revealed that the practice of the decontamination of impressions and prosthesis work is not respected by the majority of Moroccan dentists working in the private sector in the city of Casablanca, and that there is an underestimation of the risks incurred by communicable diseases through prosthesis work going from the office to the laboratory and vice versa.

Competing Interests

The authors declare no competing interest.

Authors' Contributions

R.L. and M.G. conceived and designed the study and performed the statistics; I.B. and A.A. synthesized and wrote the manuscript; all authors have contributed to analyzing the data and revising the manuscript.

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