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Predoctoral dental implant education at King Abdulaziz University

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Abstract Objective: In June 2008, a survey of freshly graduated dental students of King Abdulaziz University Jeddah was conducted to evaluate the extent of their exposure to oral implantology and their knowledge of some basic principles of dental implant treatment.

Materials and methods: Multiple-choice questionnaires were given to the fresh graduate dental students of King Abdulaziz University Jeddah to answer. Sixty-six students responded out of 86, yielding a response rate of 76.7%.

Results: Majority of the students (78.8%) thought that they did not have enough lectures about dental implants and all of them thought that they did not have enough training in dental implant. Most of the students were not familiar with different dental implant systems (61.1%), designs (60.6%) or sizes (74.2%). Majority of the students were lacking the knowledge about basic principles of dental implant treatment. At King Abdulaziz University, Faculty of Dentistry, implant dentistry is taught to the students in the form of implant-related lectures incorporated into their periodontic, oral surgery and prosthodontic courses with one or two lectures given on dental implant in each course.

Conclusion: There is an urgent need to develop a well-structured implant course that includes didactic, laboratory, preclinical and clinical components at the undergraduate curriculum of King Abdulaziz University Faculty of Dentistry.

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1. Introduction

The use of dental implants in the rehabilitation of partially dentate and completely edentulous jaws has become a well-established and accepted contemporary clinical method (Esposito et al., 1998). Long-term multicenter studies have supported the predictability of implant success in different clinical situations. With increasing patients' acceptance of dental implant treatment due to the high success rate, general practitioners may encounter patients in everyday practice who have undergone dental implant treatment. There is

increasing requirements for the dentist to be familiar with the principles of the dental implant technique and maintenance (Young et al., 1999).

In 1990, the American College of Implantology and the University of Pittsburgh presented curriculum guidelines for predoctoral implant dentistry (Schools, 1991). The guidelines suggested that upon the completion of dental school program, dental students should know the indication for implant supported restorations and be able to compare it to other prosthodontic treatment modalities. Graduates should also be knowledgeable enough to seek referrals when needed (Maalhagh-Fard et al., 2002).

Several surveys have been conducted in the past and recent years to determine the extent to which dental schools incorporate implant dentistry in their predoctoral curricula in USA. These surveys showed steady increase in the incorporation of implant dentistry didactic instructions in predoctoral dental curriculum from 33% in 1974 (Chappell, 1974), to 73% in 1990 (Bavitz, 1990), to 86% in 1995 (Weintraub et al., 1995), to 89% in 1997 (Wilcox et al., 1997) and to 97% in 2006 (Petropoulos et al., 2006; Lim et al., 2005).

Since 1995, there has been increase in hands-on training offered to predoctoral students, from 41% of the schools (Weintraub et al., 1995), to 78% in 2005 (Lim et al., 2005), to 86% in 2006 (Petropoulos et al., 2006). Also there has been a significant increase in predoctoral students restoring implants as a part of their clinical training from 11% in 1990 (Bavitz, 1990) to 88% in 2005 (Lim et al., 2005).

Watson (1993) investigated the incorporation of implant dentistry within the predoctoral dental curriculum in the United Kingdom and Eire. He found that 16 of 17 schools offered courses in implant dentistry to predoctoral and postdoctoral students.

De Bruyn et al. (2009) carried out a survey among 73 opinion leaders from 18 European countries invited to the Association for Dental Education in Europe (ADEE) workshop. He found that theoretical and preclinical courses in an average of 36 h are given to undergraduates. Of these participants, 70% reported that students assisted or treated patients with prosthetics, 53% reported that students assisted with surgery and only 5% reported that students operated on patients. About 23% of the schools had optional undergraduate implant courses and 90% offer postgraduate training.

A consensus documents released at the First European Workshop on Implant Dentistry University Education recommended that implant dentistry should be an integral part of the undergraduate curriculum (Mattheos et al., 2009a).

It is, therefore, apparent that more and more dental schools around the world are incorporating implant dentistry into their predoctoral curricula.

There has not been any recently published survey assessing the trends of predoctoral implant education in Saudi Arabia or any country in the Middle East. The aim of this survey was to investigate the basic knowledge of dental implant treatment among the freshly graduated dental students from King Abdulaziz University Faculty of Dentistry, Jeddah, Saudi Arabia.

2. Materials and methods

A 21 multiple-choice questionnaire was given to the fresh graduate dental students of King Abdulaziz University to answer.

Sixty-six students out of 86 returned the questionnaire, yielding a response rate of 76.6%. The questions were about the extent of exposure to oral implantology and some basic knowledge about dental implants.

3. Results

The results are reported by summarizing responses to each of the 21 questions in the survey.

Question 1: How many lectures did you have about dental implants? Twenty-eight students (42.4%) reported that they had more than four lectures, 21 students (31.8%) reported that they had four lectures and 17 students (25.8%) reported that they had three lectures.

Question 2: Do you think you had enough lectures about dental implants? Majority of the students (52 students = 78.8%) thought they did not have enough lectures about dental implants while 21.2% thought they did.

Question 3: Do you think you had enough training in dental implants? All the students thought they did not have enough training in dental implant.

Question 4: Did you attend any implant surgery? Most of the students (50 students = 75.8%) did not attend any implant surgery while 16 students (24.2%) reported that they attended implant surgery.

Question 5: Are you familiar with different dental implant systems? Forty-one students (62.1%) reported that they were not familiar with different implant systems, 25 students (37.9%) reported they were.

Question 6: Are you familiar with different dental implant designs? Forty students (60.6%) reported that they were not familiar with different implant designs, 26 students (39.4%) reported they were familiar.

Question 7: Are you familiar with different dental implant sizes? Forty-nine students (74.2%) reported that they were not familiar with different implant sizes, 17 students (25.8%) reported they were.

Question 8: Can dental implant be placed for smoking patients? Most of the students (56 students = 84.8%) reported that dental implants could be placed for smoking patients, 10 students (15.2%) reported it could not be placed.

Question 9: Can dental implant be placed for diabetic patients? Most of the students (58 students = 87.9%) reported that dental implants could be placed for diabetic patients, eight students (12.1%) reported it could not be placed.

Question 10: Can dental implant be placed for osteoporotic patients? Majority of the students (47 students = 71.2%) reported that dental implants could not be placed for osteoporotic patients, 19 students (28.8%) reported it could be placed.

Question 11: Can dental implant be placed for periodontally compromised patients? Forty-two students (63.6%) reported that dental implants could not be placed for periodontally compromised patients, 24 students (36.4%) reported it could be placed.

Question 12: Can dental implant be placed for patients with advanced carious lesions? Forty students (60.6%) reported that dental implants could be placed for patients with advanced carious lesions, 26 students (39.4%) reported it could not be placed.

Question 13: Can dental implant be placed for patients with poor oral hygiene? Forty-two students (63.6%) reported that

dental implants could not be placed for patients with poor oral hygiene, 24 students (36.4%) reported it could be placed.

Question 14: Resorption of bone after extraction is more in mandible or maxilla? Forty-two students (63.6%) reported that resorption was more in the mandible than the maxilla, 23 students (34.8%) reported that resorption was more in the maxilla than the mandible.

Question 15: Did you hear about immediate implant placement? Most of the students (65 students = 98.5%) reported they heard about immediate implant placement, one student (1.5%) reported he did not hear about it.

Question 16: If the answer for question 15 is yes, what is immediate implant placement? Sixty students (92.3%) reported that it was implant placement at the time of extraction, 5 students (7.7%) reported that it was implant placement and restoration at the same time.

Question 17: In immediate loading of dental implant, the prosthesis delivered should be temporary or final or any of the previous? Twenty-nine students (43.9%) reported that the prosthesis delivered in immediate loading should be temporary, 20 students (30.3%) reported that it should be final, 16 students (24.2%) reported that it could be temporary or final, one student did not answer this question.

Questions 18–21: The last four questions are about some basic knowledge in implant dentistry like the safe distance between the apical part of implant osteotomy and the inferior alveolar nerve, the minimum distance between distal part of dental implant and mental foramen, the minimum distance between dental implant and natural tooth, and the minimum distance between two implants. The average percentage of students who answered the four questions correctly was 32.5%, the average percentage of students who answered the four questions wrongly was 67.5%.

4. Discussion

Learning in academic settings is strongly related to the way the students are tested or examined. Assessment therefore must be integrated in the curriculum design, coordinated and should reflect the learning outcomes of the education. Assessment within the field of implant dentistry must fulfil four major objectives: complete and direct the learning process with feedback (formative), ensure that students are adequately prepared (summative), assess attitudes and skills such as critical thinking, reflection and self-assessment ability, and supply continuous feedback to teachers on curricular content and impact (Mattheos et al., 2009b).

At the present time, every university dental school provides predoctoral dental implant courses (Young et al., 1999). However, the precise nature of these courses is different from one school to another. Some schools provide separate dental implant courses which include didactic part and may or may not have laboratory or clinical training. Other schools provide implant-related lectures incorporated in the curriculum of related subject such as prosthodontics, periodontics and oral surgery (Petropoulos et al., 2006).

With rapidly expanding use of dental implants, dental graduates may encounter more patients with dental implants. The monitoring and maintenance of those implants may then fall upon general dental practitioner (Young et al., 1999). General practitioner should have the ability to maintain these implants

and recognize associated pathology if present. They should also be able to know when to refer the patient to specialists. Many schools in United States allow their senior predoctoral students to restore single implants and implant overdenture (Maalagh-Fard et al., 2002; Bavitz, 1990; Lim et al., 2005; Afsharzand et al., 2005; Huebner, 2002).

Studies have shown that recent graduates were more inclined to offer and restore implants in their practice when their dental school curricula include implant courses (Maalagh-Fard et al., 2002; Afsharzand et al., 2005). Therefore, schools need to incorporate a combination of didactic, laboratory, as well as clinical training in dental implants within their predoctoral programs in order to prepare students well for viable use of dental implants in their practice (Afsharzand et al., 2005).

Implant therapy has evolved into an important part of today's daily dental practice. Appropriate knowledge of diagnostic and therapeutic options with dental implant therapy is, therefore, mandatory for dental students. Students need a solid basic knowledge about biological prerequisites and clinical procedures leading to successful implant treatment and, in particular, an understanding of the importance of embedding implants into the overall treatment concept. The students should also be able to differentiate between low, medium and high-risk situations. Furthermore, the dentist needs to be competent in evaluating clinical situations and in advising patients about the suitability of the different options. In cases of peri-implantitis the student should be knowledgeable regarding suitable interventions (Hicklin et al., 2009).

At King Abdulaziz University Faculty of Dentistry, implant dentistry is taught to the students in the form of implant-related lectures incorporated into their periodontic, oral surgery, and prosthodontic courses with one or two lectures given on dental implant in each course. The school does not have predoctoral clinical competency requirement for both surgical placement and/or restoration of dental implants. This is due to (1) limited number of dental implant patients in the school, (2) the high cost of dental implant treatment and, (3) inadequate time in an already crowded dental school curriculum, so student were not having enough lectures or training in dental implants. This explains the poor level of knowledge about some basic principles of oral implantology as seen in the responses to the survey questions.

There is generalized feeling from the student that they did not have enough didactic or clinical training in dental implant. Most of the students did not attend any implant surgery, those who attended (16 students = 24.2%) were lucky because one of their comprehensive care cases needed implant and their instructor(s) allowed them to attend the surgery. Majority of the students were not familiar with different dental implant systems (61.1%), designs (60.6%) or sizes (74.2%).

A proposal was given to the Curriculum Development Committee at the Faculty of Dentistry in King Abdulaziz University to include a full dental implant course in the final year of predoctoral training. This course should include lectures about surgical and prosthetic aspects of dental implants, laboratory training, preclinical training and clinical training. This proposal was approved by the committee, School of Dentistry Board and King Abdulaziz University Board. The curriculum of the school was modified by decongestion, eliminating redundancy and conflict between different courses to create a space for the implant course. Starting at fall of 2010, the dental

school at King Abdulaziz University, having the qualified well-trained faculty, will incorporate dental implant program in the predoctoral curriculum which will not only include didactic and laboratory components, but actual student participation in the placement and restoration of dental implants, as well as the recall of implant patients.

5. Conclusions

The questionnaire showed poor level of knowledge of fresh dental graduates of King Abdulaziz University on some basic principles of dental implantology. The students were not satisfied about their level of education or clinical training in dental implant. There was an urgent need to develop a well-structured implant course that include didactic, laboratory, preclinical and clinical components at the curriculum of King Abdulaziz University dental school.

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