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Original article

Knowledge and awareness of undergraduate dental students on the effect of various medications on periodontal health

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ABSTRACT

Aim-To evaluate the knowledge and awareness of senior (fourth, fifth, and sixth year) dental students on the effect of various drugs on periodontal health. **Material and Methods**-A questionnaire to assess the knowledge and awareness of the effect of various drugs on the periodontal health was distributed electronically to a convenience sample of senior (fourth, fifth, and sixth year) dental students in Riyadh Colleges of Dentistry and Pharmacy. Data was analysed using SPSS and association between the variables was performed using Chi-square test. R**esults**-A total of 225 students completed the questionnaire. An overview of the students correct answers to the questions on the various drugs and their effect on the periodontium revealed 48% of the students answered "Increase the bleeding on probing" when asked about Aspirin and 22.8% answered "Reduce the periodontal inflammation" when asked about Ibuprofen. However, there was no statistically significant association between different variables. **Conclusion**-The curriculum of the dental school should highlight the importance of knowing the side effects and benefits of the drugs and relate them to the students future dental training. The students should get more exposure to elderly and medically compromised patients in their clinical practice.

Introduction

Due to our increased understanding of the causes and processes of the various medical conditions, the average age of the adult population has increased. Alongside it increased the use of medications to cure, treat, and manage those diseases which has been elevated more than ever. Besides, due to the increased awareness of the importance in maintaining a good oral hygiene, the teeth are being preserved and retained longer than before (1).

A wide variety of medications used to treat various medical conditions can have either a negative or positive effect on the periodontal tissues(2). Drug-induced gingival overgrowth (3), increased risk of periodontitis, and desquamative gingivitis are some of the negative effects observed (4), while a reduction in the periodontal inflammatory mediators, reduction of the progression of attachment loss, and reduction in the bacterial counts are some of the positive effects observed with some medications (5).

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Phenytoin was introduced in the 1930s as an anticonvulsant prescribed for the control of epilepsy and neuralgias. Nifedipine and other calcium channel blockers are used to manage hypertension and cyclosporine is used extensively in organ transplant patients. All three of these share the same side effect on the periodontal tissue which is gingival overgrowth (1, 6). Prolonged therapy with corticosteroids can be a risk factor for osteoporosis, which is also considered as a risk factor for periodontal disease (1). Patients on long-term Non-Steroidal Anti- Inflammatory Drugs (NSAIDs) had reduced amounts of gingival inflammation and probing depths (7)and they also offered some protection against alveolar bone loss (1). A positive effect of bisphosphonates in slowing the progression of bone resorption in periodontitis was also observed by (6).

The referrals to a periodontist tends to be neglected except for severe periodontically compromised cases, while the referral base on a preexisting medical condition or due to a side effect of a drug ingested by the patient were very minimal among dental students

(8) and medical physicians (9). To our knowledge no study was conducted to assess the knowledge of any dental or medical personnel in regard to the relationship between various medications and periodontal health. This study aims to evaluate the knowledge and awareness of senior (fourth, fifth, and sixth year) dental students in Riyadh Colleges of Dentistry and Pharmacy (RCsDP) on the effect of various drugs on periodontal health.

Material and Methods

A questionnaire was designed to assess the knowledge and awareness of the effect of various drugs on periodontal health among the senior dental students. The questionnaire was pretested on five subjects to check its clarity; after the notes of the subjects were taken into consideration the questionnaire was distributed to twenty subjects to test its validity and reliability. The same twenty subjects were given the questionnaire once again after one week. Then the data of the first and second questionnaires were tested using Cohen's Kappa.

The questionnaire was distributed to the senior (fourth, fifth, and sixth year) dental students, both male and female in the RCsDP using the convenience sampling method. The questionnaires were distributed electronically using Google forms. The encoding of the answers was done using Microsoft Excel 2013 and the statistical analysis was performed using IBM SPSS, Version 22. The frequencies of the submitted data were measured using the mode and median for the nominal and ordinal variables. Chi-square test was used to determine the association between the variables. A p value of ≤ 0.05 was considered as statistically significant.

Results

The validity and reliability of the questionnaire were tested on twentyrepresentative samples of students who were not part of study. Cohen's Kappa was used to measure the agreement between the readings. The values for the various readings ranged between 0.84 to 0.94, which is interpreted as a "very good" agreement according to the classification by Altman (1991) (10)

and is interpreted as an "almost perfect agreement" according to the classification by Viera and Garrett (2005) (11).

Of the 225 students who completed the questionnaire, 65.8% were males and 34.2% were females. Fifth year students showed the highest response rate (41.3%),

while the 6th year and 4th year dental students were 32% and 26.7% respectively. Of the sample, 80% were Saudis and 85.8% were aged between 21 to 25 years. The percentage of the students with a Grade Point Average (GPA) > 4.74 was 10.5%, while the students between 3.75 and 4.74 were 47.3%, the ones between 2.5 and 3.74 were 39.1%, and with< 2.5 were at 3.2% (Table 1).

When asked about their previous clinical experiences, 48.7% of the sample had treated patients over the age of 60 years, 46.9% have treated hypertensive patients, 12.1% have treated epileptic patients, 7.6% have treated patients who underwent a kidney, liver or bone marrow transplant, and 13.3% have prescribed a systemic antibiotic for the treatment of periodontal disease (Figure 1). An overview of the students correct answers to the questions on the various drugs and their effect on the periodontium revealed that 26.7%, 23.8%, and 19.3% of the students answered "Gingival overgrowth" when asked about Phenytoin, Nifedipine, and Cyclosporine respectively.

Forty eight percent of the students answered "Increase the bleeding on probing" when asked about Aspirin, 22.8% answered "Reduce the periodontal inflammation" when asked about Ibuprofen, 9.8% answered "Increase the tendency of periodontal inflammation" when asked about Oral Contraceptives, 9.9% answered "Reduce the amount/rate of bone loss" when asked about Bisphosphonate, and 7.6% answered "Improve the periodontal attachment level" when asked Doxycycline. Finally, when asked about Dexamethasone and Cortisone, 9% and 5.4% answered "Increase the amount/rate of bone loss" respectively (Figure 2).

While comparing the students who correctly answered the questions on the various drugs and their previous

Gender	***Male***		***Female***	
	65.8%		34.2%	
Nationality	***Saudi***		***Non-Saudi***	
	80%		20%	
Age	***< 21 Years***	***21 to 25 Years***	***> 25 Years***	
	7.1%	85.8	7.1%	
Year in Dental School	***4th Year***	***5th Year***	***6th Year***	
	26.7%	41.3%	32%	
Grade Point Average (GPA)	***> 4.74***	***3.75 to 4.74***	***2.5 to 3.74***	***< 2.5***
	10.5%	47.3%	39.1%	3.2%

Table 1.Demographic characteristics

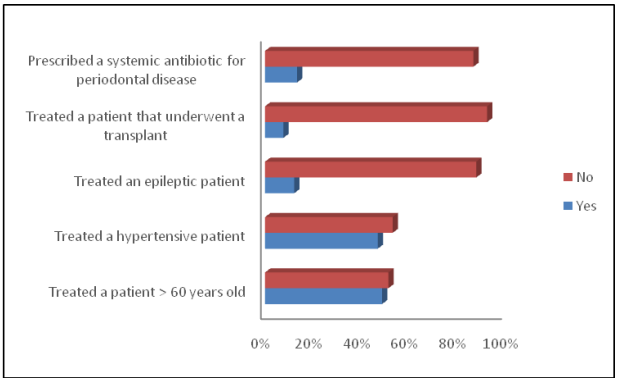

Figure 1.Distribution of previous clinical experiences among the students

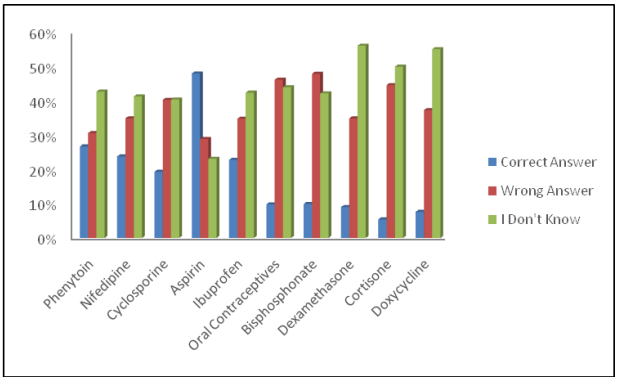

Figure 2.Students response on each individual drug

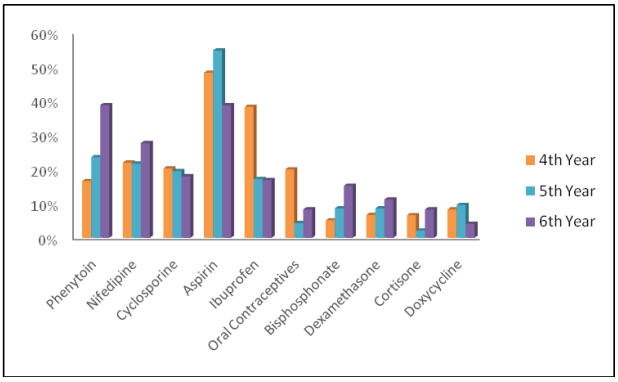

Figure 3. Correct answers of individual drugs by students year of dental school

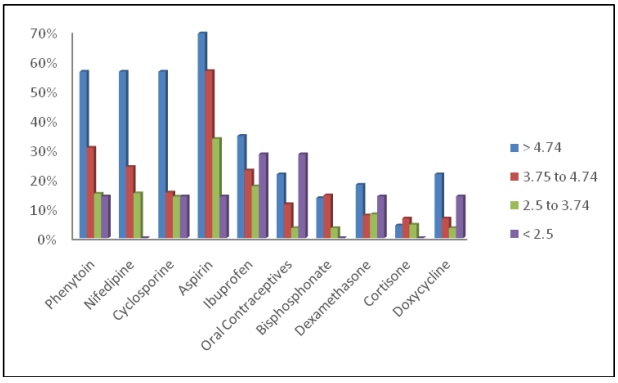

Figure 4. Correct answers of individual drugs by students GPA

clinical experience showed that the students who treated patients over the age of 60 years had a higher percentage of correctly answered questions on Aspirin, Dexamethasone, Ibuprofen, and Bisphosphonate. The students who treated hypertensive patients had a higher percentage of correctly answering the question on Nifedipine. For the other groups, the clinical experience didn't affect the tendency to answer correctly as the students without any previous experience had the higher percentages of correct answers. Chi-square test showed no statistical significance association between the groups ($p > 0.05$).

A relation between each individual year of dental school and the correct answer for each question showed that for the questions on Nifedipine, Cyclosporine, Ibuprofen, and Oral Contraceptives, 4th year students had the highest percentage at 22%, 20.3%, 38.3% and 20% respectively. For the questions on Aspirin and Doxycycline, 5th year students had the highest percentage at 54.8% and 9.6% respectively. Finally, for questions on Phenytoin, Bisphosphonate, Dexamethasone, and Cortisone, 6th year students had the highest percentage at 38.8%, 15.2%, 11.2% and 8.3% respectively. However, Chi-square test showed no statistical significance between the groups ($p > 0.05$) (Figure 3).

In relation to the GPA of the students to the correctly answered questions on the drugs showed that in 7 out of the 10 questions the students with the highest GPA also had the highest percentage of correct answers. The other 3 questions where the pattern varied were on the Bisphosphonate and Cortisone with 3.75 to 4.74 GPA students having the highest percentage of correct answers and Oral Contraceptives with the < 2.5 GPA students having the highest percentage of correct answers. However, Chi-square test showed no statistical significance between the groups ($p > 0.05$) (Figure 4).

Discussion

The life expectancy of the patients has increased over the past years as medical and pharmaceutical fields are advancing rapidly. Therefore the students should be well trained and informed on how to manage elderly and medically compromised patients and their

medications (1). This study showed that a large number of the students have treated a patient over the age of 60 years (48.7%), which coincides with the increase in elderly patients referred to in the literature (12).

More than 50% of the student samples haven't treated a patient over 60 years old, hypertensive, or a transplant patient. This observation can be related to the perception of the students that the elderly and medically compromised patients will not be able to cooperate during the treatment or they won't be able to attend the appointments regularly, as it was observed among the general dentists by Corah *et al.* (1982) (13).

All the side effects or benefits of the drugs mentioned in the questionnaire have been explained to the students in their third year of dental school in at least two courses (Dental Therapy and Periodontology). However, it was observed that in all the questions on various drugs other than Aspirin, the correct answer had the lowest percentage. The highest medical condition that came across the students sample was hypertension (46.9%)and as Aspirin is usually ingested by the general public as a prophylactic measure or to manage any cardiovascular events (14, 15) it had the highest percentage of correct answers (48%).

In this study it was observed that 12.1% of the students have treated a patient with epilepsy which is explained by the high incidence of epilepsy in the Kingdom of Saudi Arabia (KSA) at 6.54 per 1000 as recorded by Al Rajeh *et al.* (2001) (16). Due to its high prevalence, lot of students have heard of or known a person suffering from epilepsy and that has shown in their information retention when asked about the three drugs that might cause gingival over growth.The highest percentage of correct answers was for the Phenytoin (26.7%).

It was observed that Nifedipine and Ibuprofen had the second and third highest percentage of correct answers after Aspirin, which can be related to the high incidence of hypertension in KSA at more than one fourth of the adult population (17) and the increased prescription of Ibuprofen for pain relief (18, 19). The observed data of correct answers were unevenly distributed among the three years of dental school included in the sample, which didn't follow the pattern observed by Friesen *et al.* (2014)(8). On the contrary, the students with the highest GPA had the highest percentage of correct answers (7 out of the 10 questions) on the various drugs, with 2 of the remaining 3 being correctly answered by the second highest GPA group.

Conclusion

The curriculum of the dental school should highlight the importance of knowing the side effects and benefits of the drugs and relate them to the students future dental training. The students should get more exposure to elderly and medically compromised patients in their clinical practice and they should be encouraged to accept and treat those patients.

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