



EVALUATION OF DENTISTS' KNOWLEDGE IN INFECTIVE ENDOCARDITIS PROPHYLAXIS

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Abstract: Infective endocarditis (IE) is an infection caused by microorganisms affecting the natural/prosthetic heart valve and surrounding tissues. Antibiotic prophylaxis is necessary to prevent IE in some dental procedures due to mortality rate. This particular study was primarily motivated to evaluate the dentists' knowledge in IE prophylaxis. Participants of the study were 80 dentists who were selected through the purposive sampling method (Female= 44; Male= 36). To collect data, a questionnaire with questions about prophylaxis data on heart diseases, dental procedures, the purpose, frequency, duration and dose of the drugs used was used. The participants were informed about prophylaxis of IE after the data collection during a seminar. Subsequently, their responses to the questionnaire items were statistically analyzed and the relevant results were presented in the following section. 36 male and 44 female dentists working in Kahramanmaraş city center and districts participated in the study on a voluntary basis. It was revealed that the respondents tend to decide on IE prophylaxis mostly requesting consultation from cardiologists (68.8%), family physicians (2.6%) and infectious diseases specialists (1.3%) while 3.9% of them applied prescription only based on their professional experience. This particular research has shown that dentists made some mistakes while performing antibiotic prophylaxis such as unnecessary use of antibiotics. Based on this finding, they should be provided in-service training programmes organized on a regular basis to contribute to their professional development by updating their field knowledge.

Keywords: Infective endocarditis, Dentistry, Antibiotic therapy, Dental treatment

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1. Introduction

Infective endocarditis (IE) is an infection caused by microorganisms affecting the natural or prosthetic heart valve and surrounding tissues (Gencay Keçeli et al., 2013). IE is a uncommon but serious disease with an in-hospital mortality rate of approximately 20% and a five-year mortality rate of 40% (Tubiana et al., 2017). Bacteria that exist in the oral flora do not cause IE even if they trigger bacteraemia in healthy individuals. Infection usually occurs in previously damaged otherwise malformed areas of the heart tissue. It is usually treatable with antibiotics but IE is life-threatening since up to 30% of the sufferers who are treated with antibiotic therapy can die of it (Glenny et al., 2013). The recommendation of prophylactic antibiotics (PA) prior to dental treatment is common although factors that influence the prescription process are poorly understood (McCarthy et al., 2019). Antibiotic prophylaxis is necessary to prevent IE in some dental procedures due to the afore-mentioned mortality rate. This particular study was primarily motivated to evaluate the dentists' knowledge in IE prophylaxis.

2. Material and Methods

Participants of the study were 80 dentists who were selected through the purposive sampling method

(Female= 44; Male= 36). At the time of data collection, they were working at oral dental health hospitals and faculty of dentistry affiliated to a state university located in the province of Kahramanmaraş, Turkey. The latter was elicited through such details about the preferred dental procedures in certain disorders, the purpose, frequency, duration and dosage of the preferred drugs. Informed consent form was obtained from the participants before the questionnaire was applied. The participants were informed about prophylaxis of IE after the data collection during a seminar. Subsequently, their responses to the questionnaire items prepared as multiple choice were analyzed statistically and the relevant results are presented in the following section. In the statistical evaluation, frequency analyzes were made.

2.1. Ethical Consideration

It is noteworthy that the ethical standards of the Ethics Committee of Kahramanmaraş Sütçü İmam University Faculty of Medicine were considered during the data collection procedure (Decision No: 11, Date: 13.11.2019).

3. Results

36 male and 44 female dentists working in Kahramanmaraş city centre and districts participated in the study on a voluntary basis. The majority of their age

ranges from 24 from 30 age range (62.5%) (Figure 1). It was revealed that the respondents tend to decide on IE prophylaxis mostly requesting consultation from cardiologists (68.8%), family physicians (2.6%) and infectious diseases specialists (1.3%) while 3.9% of them applied prescription only based on their professional experience. The remaining 23.4%, on the other hand, reported that they requested consultation from multiple sources to decide on prophylaxis.

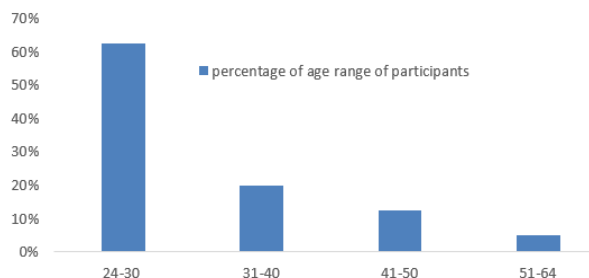


Figure 1. Distribution of age range of participant.

The findings have demonstrated that prophylaxis is performed by all participants during tooth extraction, followed by manipulation of the gingiva and periapical region (88.3%), in cases where the oral mucosa may be perforated (74%), root canal treatment (64.9%), orthodontic appliances and placement of removable prosthodontic instruments (9.1%), removal of suture (5.2%), and dental radiography (1%).

Their responses to the question on the use of prophylaxis in heart diseases showed that it is mostly implemented in history of passed IE (96.1%), prosthetic heart valves (92.1%), rheumatic fever-associated cardiac diseases (88.2%), congenital, unrepaired complex cyanotic heart disease (75%), valvulopathy developed heart transplant (56.6%), mitral valve prolapse (36.8%), coronary artery disease (18.4%) and unspecified (5%).

Their responses on the use of drugs in adults indicated that oral amoxicillin+clavulonate was mostly preferred (71.1%), followed by oral amoxicillin (36.8%), oral clindamycin (6.6%), IM ampicillin (3.9%) and IV ampicillin (1.3%). The drugs used by dentists for prophylaxis in paediatric patients are given in Figure 2.

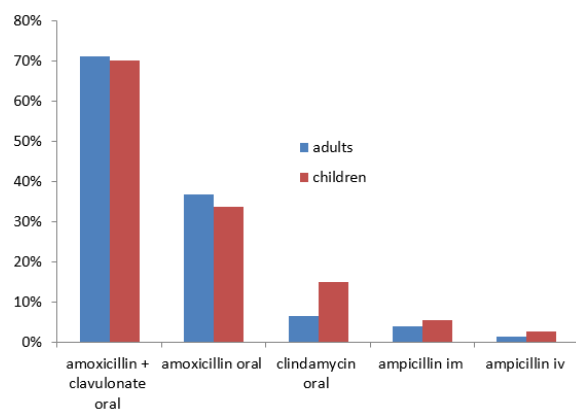


Figure 2. Distribution of prescribed drugs.

As a follow up question, they were asked to state when they perform prophylaxis prior to the treatment. All of the dentists informed that they performed it 30-60 minutes before the procedure.

The last question required them to specify the duration of drug use in concern. Most of the participants reported that they use a single dose (71.1%) while 13.2% informed that they use it one day. These are followed by those who stated that they use it for 3 days (9.2%), 5 days (6.6%) and 7 days (1.3%).

4. Discussion

IE is a microbial disease caused by retention of bacteria on damaged heart tissue. Several dental procedures cause bacteremia and it was believed that this might lead to infective endocarditis in a few people (Glenny et al., 2013). Antibiotics are generally prescribed for dental, orofacial infections and as prophylaxis against infections which cause endocarditis at risky patients (Anjum et al., 2014). In this study, we evaluated a group of dentists' current knowledge in IE prophylaxis and informed them about the prophylaxis with the right indication.

While the 2008 NICE guideline suggests that no prophylaxis is required in dental procedures, the 2016 update reveals that prophylaxis is recommended in high-risk dental procedures instead of routine procedures. Oral use of amoxicillin 3 g or clindamycin 600 mg is extensively recommended one hour before the treatment (Chambers et al., 2016). Even though one could argue that the 2008 NICE guidelines were strict, the ESC and AHA guidelines take a sensible method in that regard. Nonetheless they both recommend antibiotic prophylaxis in patients with the highest risk for IE, in which an IE period carries possibly the highest morbidity and mortality, although they inform a significant lack of evidence regarding antibiotic prophylaxis and restriction in its widespread use (Charitos and Sinning, 2019). In their large-scale research conducted in France, Tubiana et al. (2017) concluded that invasive dental treatments may contribute to the development of IE in adults with prosthetic heart valves.

Prophylaxis is recommended by the guidelines: (i) Patients with prosthetic valves or those who used prosthetic materials for heart valve repair, (ii) Patients who previously had IE, and (iii) People with congenital heart disease (a. Cyanotic congenital heart disease without surgical repair, b. Patients with congenital heart disease who underwent full surgical repair using prosthetic material (surgical or percutaneous technique) up to 6 months after the procedure, and c. Continuous residual defect or valve regurgitation in the area where the prosthesis material or device is placed). These findings of our research largely overlap with Spittle et al. (2017) who previously concluded that patients with a history of IE and prosthetic heart valves were correctly identified by the majority of dentists as 'in need of antibiotic prophylaxis'. However, only one-third of the dentists reportedly prescribed antibiotic prophylaxis

appropriately for patients with a congenital heart defect prosthetic material or device placed during the first 6 months after the procedure and cyanotic congenital heart disease that had not been repaired.

Guidelines can be followed in the administration of antibiotic prophylaxis to prevent the development of infective endocarditis, and consultation may be requested from cardiologists in order not to take risks in cases where there is doubt. In the study by Tong et al., It was reported that a significant number of dentists routinely consult cardiologists for advice on the need for PA for their patients (Tong et al., 2014). In this study, only 3.9% of dentists stated that they performed PA by following their own professional knowledge, while the majority reported that they consult with cardiologists.

According to the latest guidelines, prophylaxis is not recommended during dental suture removal, placement of orthodontic appliances and dental radiography. Ryalat et al. (2016) reported that most of the dentists performed PA in dental extractions (87.4%), followed by periodontal operation (88.2%) and that only 17.3% of them thought that PA is necessary in simple tooth restorations. Similar to the results of our study, in the study conducted by Al-Fouzan et al. (2015), most of the dentists indicated that they performed PA in invasive procedures and they did not apply PA in dental radiography and non-banded orthodontic appliances.

Appropriate drug selection is one of the most important steps in PA. Current study has shown that only 36.8% of dentists use the correct antibiotics. In the survey study of Cloitre et al. (2018) 79.9% of dentists reported that they prescribed AP prior to a risky dental procedure, but only 22.5% prescribed an appropriate adult primary care AP (2 g amoxicillin), and 43% prescribed clindamycin in case of penicillin allergy.

Lastly, the research finding on the duration of drug use revealed that most of the dentists reportedly use a single dose (71.1%). However, the prophylaxis dose should be used in a single dose; in other words, its use should be avoided the following days once it is implemented once. The misuse of prophylactic antibiotics may lead to multiple unfavorable consequences for patients such as unsuccessful drug therapy, avoidable adverse effects, destructive drug interactions and avoidable costs (Lisboa et al., 2015).

5. Conclusion

This particular research has shown that dentists made some mistakes while performing antibiotic prophylaxis such as unnecessary use of antibiotics. Based on this finding, they should be provided in-service training programmes organized on a regular basis to contribute to their professional development by updating their field knowledge.

Author Contributions

All authors' contributions were equal.

Conflict of Interest

The authors declare that there is no conflict of interest.

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