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**Knowledge Attitudes and practice of Tunisian dental interns regarding anti-infective drugs in oral medicine and oral surgery: a pilot study****Connaissances, attitudes et pratique des internes tunisiens en médecine dentaire vis-à-vis les anti-infectieux en médecine et chirurgie buccales : étude pilote**

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Abstract

Introduction: Interns in dental medicine attend to patients with various problems requiring drug prescription. The aim of this study was to evaluate knowledge, attitude and practices regarding anti-infective drugs in oral medicine and oral surgery among Tunisian dental interns.

Materials and methods: A pilot study was conducted among 40 dental interns from January to Mars 2022 using an online questionnaire assessing knowledge, attitude and practices about anti-infective drugs prescription in oral medicine and oral surgery. Questions were inspired from international literature, validated by the staff of oral medicine and oral surgery department at the dental faculty of Monastir, Tunisia.

Results: A total of 40 interns responded to the questionnaire, most of them were females (77.5%). Participants showed a sufficient knowledge regarding antibiotic classes, the risk of antibiotic misuse and the responsible germ for dental and fungal infections. It showed a lack of knowledge about prescription duration, antifungal and antiviral drugs. The most common prescribed antibiotic was amoxicillin (72.5%) and the most prescribed antifungal drug was Amphotericin B (69.2%). The majority of participants declared that data learned from dental courses at faculty weren't sufficient. The prescription of antibiotic for immunosuppressed patients presented some ambiguity for interns and the prescription of anti-infectious drugs was stressful for the majority of them.

Conclusion: According to this study, knowledge, attitudes and practices among interns were moderate. As a result, it's recommended to continuously educate and evaluate interns about anti-infective drugs indications and prescription in order to improve their knowledge and the quality of patient care.

Key words

Knowledge, Students, Anti-infectives agents, Prescription, Guidelines

Résumé

Introduction : Les internes en médecine dentaire s'occupent de patients présentant divers problèmes nécessitant une prescription médicamenteuse. L'objectif de cette étude était d'évaluer les connaissances, les attitudes et le pratique de ces internes concernant les anti-infectieux en médecine et chirurgie buccales.

Matériaux et méthodes : Une étude pilote a été menée auprès de 40 internes de janvier à mars 2022 à l'aide d'un questionnaire distribué en ligne. Les questions étaient inspirées de la littérature internationale et validées par le staff enseignant du service de médecine et de chirurgie buccales de la faculté de médecine dentaire de Monastir.

Résultats : 40 internes ont répondu au questionnaire, la majorité étaient des femmes (77,5%). Ils ont montré une connaissance suffisante concernant les classes d'antibiotiques, le risque d'abus et le germe responsable des infections dentaires et fongiques. Ils ont montré une méconnaissance concernant la durée de prescription, les médicaments antifongiques et antiviraux. L'antibiotique le plus souvent prescrit était l'amoxicilline (72,5%) et l'antifongique le plus prescrit était l'amphotéricine B (69,2%). La majorité ont déclaré que les données apprises lors des cours à la faculté n'étaient pas suffisantes. Ils avouent qu'ils ont une ambiguïté envers la prescription d'antibiotique pour les patients immunodéprimés et la prescription de anti-infectieux était stressante pour eux.

Conclusion : Selon cette étude, les connaissances des internes étaient modérées. Par conséquent, il est recommandé d'assurer une formation et une évaluation continue pour les internes sur les indications et la prescription des anti-infectieux afin d'améliorer leurs connaissances et la qualité des soins des patients.

Mots clés

Connaissance, Étudiants, Agents anti-infectieux, Prescription, Lignes directrices

INTRODUCTION

Prescription is the act of indicating drugs to the patient after making a diagnosis. It should include the name of drug, route and frequency of administration, dosage and duration.^{1,2} Various medicines can be prescribed such as analgesics, anti-infectives and anti-inflammatory drugs.

Anti-infective drugs are medications used to treat some infections like bacterial, viral or fungal ones.

In dental practice, anti-infective prescription is mandatory in some cases specially in oral medicine and oral surgery like: local or focal infection, prophylaxis, after removal of erupted or impacted teeth, before or after implant placement, trauma, oral Candidiasis and herpes.^{3 - 11}

This prescription should respect guidelines or rules, particularly the choice of adequate drug and its dosage to avoid toxicity or aggravation of the disease, in addition to the risk of drug resistance and other side effects occurrence.

Accordingly, drugs should be prescribed by a qualified physician or dentist. Nevertheless, during their clinical trainings, residents, interns, fifth- or fourth-year students are allowed to prescribe medicines under the supervision of professors.

In fact, the Tunisian dental academic cursus consists in 6-years studies. The initiation of drug prescriptions notions begins at the third year, in the pharmacology course. Then they familiarize with anti-infective medicines when they take microbiology and virology courses also during the third year and specialized courses of oral medicine and oral surgery from the third to the fifth year. At the fourth year, students begin the clinical practice in the different dental specialties, becoming more involved with patients and expected to learn clinical skills, carry out dental procedures and show a good clinical judgment to make the right decision and prescribe appropriate drugs.

There are not Tunisian guidelines for anti-infective prescription in dental medicine. Consequently, dentists should follow the international ones.

Usually, interns make relatively many prescription errors and are more likely to make these mistakes than consultants.¹² That can be related to the variety of theory notions, the influence of different teaching approaches or the attitude of some other dentists particularly at the private section. It may also be due to the lack of knowledge of prescription rules. This is particularly concerning as interns indicate an important number of prescriptions.¹³

The aim of this study was to assess knowledge, attitude and practices among interns at the dental faculty of Monastir, Tunisia regarding anti-infective prescription in oral medicine and oral surgery.

MATERIALS AND METHODS

A descriptive cross-sectional pilot study was conducted among 40 dental interns at the Academic dental clinic of Monastir, Tunisia from January to Mars 2022 using an electronic link to a structured questionnaire produced by "Google Forms" and sent via emails.

This online questionnaire was formulated in English. It included three sections: the first one solicited generality about anti-infective drugs, their main classes, indications, action spectrum as well as their dosage to explore knowledge of interns on these drugs. The second section consisted of six questions evaluating their practice in oral medicine and oral surgery. The last part was carried out to assess the attitude of interns regarding these medicines and their prescription using four questions.

The questionnaire was inspired from the relevant literature.^{2,13,14} The content validation was performed by several experts from the faculty of dental medicine of Monastir, Tunisia: experts in oral medicine and oral surgery, an expert in oral microbiology. It was also face-to-face validated with interns.

The questionnaire respected the ethical rules as it was anonym and volunteer. Responding to the survey was considered as an informed consent.

RESULTS

The response rate for the study was 100 percent. Of the 40 dental interns surveyed, 31 were women (77.5%) and 9 were men (22.5%). This study showed a higher knowledge level of interns regarding antibiotic classes and prophylactic doses, besides to the responsible germ of dental and fungal infection (figures 1,2). In the other hand, it demonstrated a lack of knowledge about antifungal classes, antivirals action and etiopathogenesis of viral diseases. The rate of right answers of the questions of the knowledge part were analyzed and reviewed in table 1.

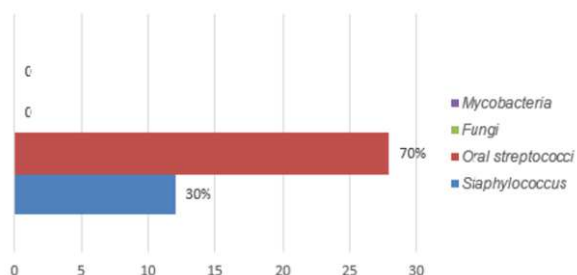


Figure 1 Response to the question related to germs involved in cervico-facial cellulitis of dental origin

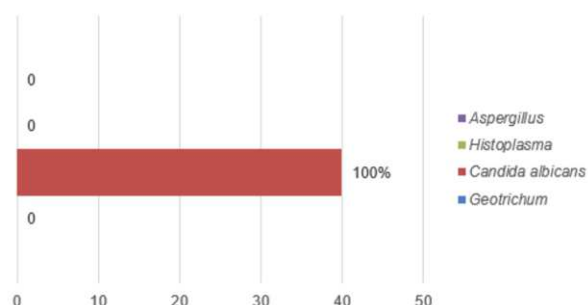


Figure 2 Response to the question related to fungi responsible of oral candidiasis

Table 1 Percentage of correct answers to questions of the knowledge part

Questions	Number of right answers	Percentage (%)
-bactericide	31	77.5
-bacteriostatic		
The most implicated germ responsible for cervico-facial cellulitis of dental origin is:		
-Staphylococcus	28	70
-Oral streptococcus		
-Fungi		
-Mycobacteria		
Aminopenicillins act on:		
-Streptococcus		
-Anaerobic bacteria		
-Some Enterobacteria	6	15
-Staphylococcus		
-Mycobacteria		
Among these molecules what are antifungal classes:		
-Azoles		
-polyenes	5	12.5
-Quinolones		
-Echinocandins		
the most implicated germ responsible for oral candidiasis:		
-Geotrichum		
-Candida albicans	40	100
-Histoplasma		

The most common recommended antibiotic for infective endocarditis prophylaxis was Amoxicillin (65%) with the dose of 2g (62.5%).

The majority of Interns (70%) reported that the usual duration of beta lactams is 7 days.

When asked about the risk of antibiotic misuse, the main common described risk was the bacteria resistance to antibiotics (75%), some other risks were cited such as the spread of the germ, toxicity and the decrease of efficiency (Figure 3).

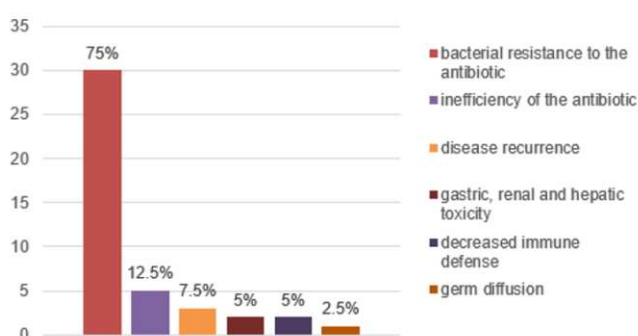


Figure 3 Risks of prescription patterns' errors according to interns' responses

The participants reported that the main sources of information about anti-infective drugs prescription and indications were dental courses at the faculty (97.4%). Regarding attitudes, 54% of the surveyed interns affirmed that information taken from dental courses at the faculty weren't quite sufficient. The half of interns responded that they have ambiguity while prescribing antibiotic for prophylaxis particularly for patients with general disorders such diabetes, cardiovascular diseases etc., and 60% of them declared that prescribing anti-infectious drugs is stressful.

Regarding practices, the most common prescribed antibiotic in the daily practice of interns in oral medicine and oral surgery was Amoxicillin (72.5%), then amoxicillin associated to clavulanic acid (17.5%). (Fig 4)

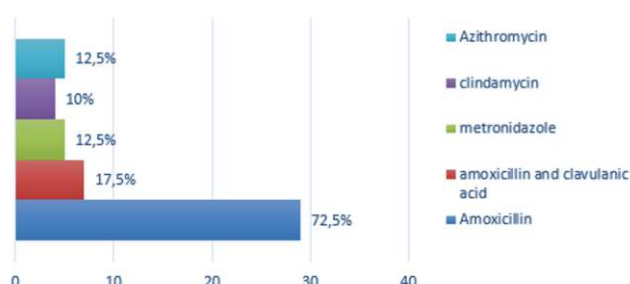


Figure 4 The most prescribed antibiotics in daily practice of interrogated interns

The majority of surveyed interns prescribed antibiotic in case of congestive cellulite (79.5%), after surgical removal of wisdom teeth (74%) and while dental extraction for immunosuppressed patients (97.4%).

Eighty-five percent of participants prescribed association of antibiotic, an analgic and antiseptic in case of cellulitis with gravity signs.

For the antifungal drugs use, 85% of interns gave rights answers regarding the indications of antifungal medicines prescription while only 25% responded correctly about the modality of prescription of these drugs. The most prescribed antifungal drug in daily practice was Amphotericin B (Fungizone®) (69.2%) then Miconazole (Daktarin®) (23.1%).

DISCUSSION

The present study aimed to evaluate knowledge, attitudes and practice among interns at the dental faculty of Monastir, Tunisia regarding anti-infectives drugs prescription and indications.

The majority of participants prescribed antibiotics in oral medicine and oral surgery for dental infection, particularly for congestive cellulitis and in case of tooth removed for immunosuppressed patients. These indications are widely documented in the literature.^{3,5,6} Moreover, interns recommended antibiotic after surgical extraction of wisdom teeth. This indication presents a controversy, in fact, for some authors, antibiotic should be prescribed after this act, for others it is not mandatory.^{8,9,15}

Interns took the right decision to carry out patients having cellulitis with signs of gravity by associating two antibiotics, antiseptic, analgesic and proscripting anti-inflammatory drugs.¹⁶ Amoxicillin was the most common antibiotic prescribed in the daily practice in oral medicine and oral surgery, these findings are in accordance with several studies.^{17,18} Amoxicillin is a bactericide antibiotic widely used in dental medicine.³ It is efficient against streptococcus, staphylococcus and some enterobacteria which are already the current microbiota associated with orofacial infections.¹⁹ In case of treatment failure, the second recommended intention treatment is Amoxicillin associated to clavulanic acid.^{3,18}

Interns surveyed haven't sufficient knowledge regarding minimal beta-lactams treatment duration which is five to seven days.²⁰

Good practices were noted among population study regarding infective endocarditis prophylaxis by respecting international guidelines.^{21,22} The majority of surveyed interns were aware of antibiotic misuse risks and reported several suggestions notably the risks of toxicity, bacterial resistance, infection exacerbation etc.^{23,24}

As for antifungal drugs, Amphotericin B was the most common prescribed antifungal. In effect, it is efficient against candida ¹⁰

Next came Miconazole. Nevertheless, in some other studies Nystatin was the most described followed by Amphotericin B.^{10,14}

The participants showed good knowledge about the germ responsible for fungal infection. Candida albicans are the most isolated yeasts in the oral candidiasis thanks to their virulence factors.²⁵ However, other yeasts may be isolated such as Aspergillus, Histoplasma particularly in immunosuppressed patients.²⁶ Interns also demonstrated good knowledge about the indications of antifungal drugs but they had confusion regarding the modality of their prescription and their classes. Here, we should mention that patterns of antifungal drug prescription are inspired from published international recommendations.^{27,28}

Likewise, antiviral drugs, surveyed interns didn't have right information about antivirals' action and etiopathogenesis of viral infections.^{11,29}

In fact, knowledge regarding antifungal and antiviral drugs seemed to be less good than this about antibiotics. This may be due to the frequency of antibiotics prescription in dentistry particularly in oral medicine and oral surgery.

According to the responses of participants, courses taken at the faculty of dental medicine of Monastir, Tunisia was the main source of information about anti-infective drugs prescription and indications. This result is logical, because interns are six-year students and during all the past five years they thrust in their academic courses and should assimilate and prepare them for exams. Besides, they don't have much time to read scientific articles or consult other sources.

Attitudes of participants were in accordance, in fact they declared having stress while prescribing antifungal drugs and ambiguity while prescribing antibiotic for prophylaxis for some particular patients, in the other hand they affirmed that their information taken from courses weren't sufficient. Consequently, for this lack of knowledge, confusion and stress were present.

To the finest knowledge of the authors, this is the first study that assessed knowledge, attitudes and practice of interns towards anti-infective drugs.

Questionnaire used for this pilot study was varied, well detailed providing an overview of knowledge, attitudes as well as practice of interns regarding anti-infective medicines prescription in oral medicine and oral surgery including antibiotic, antifungal and antiviral drugs.

Yet, this study had some limitations. In fact, as it was a pilot study, the sample size was small. Actually, interns from other foreign dental faculties were excluded from the study because courses may be different.

It will be better to enlarge the number of participants by diffusing the questionnaire among the rest of interns, residents and why not the postgraduate dentists, in order to precisely evaluate their knowledge and practice, detect their gaps and improve them.

It focused on anti-infective drugs prescription in oral medicine and oral surgery practice because this specialty requires the most prescription, due to the diversity and multitude of managed diseases and procedures.

Finding from this study were based on data collected by a self-reported questionnaire, and the responses of interns may not truly reflect their real practice.

CONCLUSION

Based on our finding, interns presented moderate knowledge and some mistakes in practice regarding anti-infective drugs prescription. This may affect the quality of patient care, safety and effectiveness of treatment. Consequently, further several changes in the curriculum should be suggested, such as the implementation of target therapeutic and clinical pharmacology courses in the continuous formation of interns followed by organized evaluation. Also, it's necessary to incorporate training educational programs including the latest international guidelines and encourage interns taking in account these recommendations while carrying out patients with the continuous assistance of their seniors.

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