



Empirical use of antibacterial drugs by dentists in Ecuador

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ABSTRACT

Introduction: the empirical and extensive use of antibiotic prophylaxis is no longer an acceptable practice, but it continues to be a frequent problem, particularly among dentists. **Objective:** to investigate the empirical antibacterial drugs use by Ecuadorian dentists. **Material and methods:** a self-designed knowledge, attitudes, and practices survey consisting of 8 questions was applied face to face to 307 dentists from eight different cities of Ecuador (Quito, Guayaquil, Cuenca, Santo Domingo, Ibarra, Loja, Manta and Portoviejo). Data was collected in an electronic database and then analyzed using GraphPad InStat. **Results:** of those dentists who completed the survey, only 32.9% of the dentists who completed the survey had a specialist's degree. When treating an abscess, only 63.5% of the surveyed doctors mentioned drainage and endodontic treatment as a first step treatment. Those who pre-treated their patients used amoxicillin (35.7%); amoxicillin plus clavulanic acid (25.3%) and azithromycin (14.8%). Amoxicillin in a dose of 500 mg was applied only on 72.7% of the cases, while the dose of 625 mg of amoxicillin and clavulanic acid was prescribed on 64% of the patients. As far as dosage utilized by the professionals, only 62.6% indicated the drug to be taken every 8 hours. Finally, on the duration of treatment 85.4% of the treatments lasted seven days for the patients. **Conclusions:** overuse of antibacterial by Ecuadorian dentists represents an important problem that might be related to the development of bacterial resistance and an increase in attention costs. Implementation of treatment protocols might help, as well as, continuous training on antibacterial therapy use.

Keywords: infection management, drug-overuse, dentistry, prescription patterns, periapical abscess, periodontal abscess.

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Uso empírico de antibacterianos por los odontólogos en el Ecuador

RESUMEN

Introducción: el uso empírico y amplio de profilaxis antibiótica ya no es una práctica aceptable, pero todavía continúa siendo un problema frecuente, particularmente entre los odontólogos. **Objetivo:** investigar el uso empírico de antibacterianos por parte de los odontólogos del Ecuador. **Material y métodos:** se aplicó una encuesta autodiseñada de ocho preguntas para evaluar conocimientos, actitudes y prácticas en entrevista cara a cara con 307 odontólogos de ocho ciudades diferentes del Ecuador (Quito, Guayaquil, Cuenca, Santo Domingo, Ibarra, Loja, Manta y Portoviejo). Los datos fueron recolectados en una base de datos electrónica y luego analizados utilizando el programa GraphPad InStat. **Resultados:** de los odontólogos que completaron la encuesta, sólo 32.9% tuvieron título de especialista. Cuando se preguntó tratamiento de abscesos, sólo 63.5% de los encuestados mencionaron drenaje y tratamiento endodóntico como primer paso de tratamiento. Aquellos que pre-trataron a sus pacientes utilizaron amoxicilina (35.7%), amoxicilina más ácido clavulánico (25.3%) y azitromicina (14.8%). La amoxicilina en dosis de 500 mg fue utilizada sólo en 72.7% de los casos, mientras que la dosis de 625 mg de amoxicilina más ácido clavulánico fue prescrita en 64% de los pacientes. En cuanto al periodo de administración sólo 62.6% de los profesionales lo utilizaron cada 8 horas. Por último, sobre la duración del tratamiento, 84.5% de los pacientes lo recibieron por al menos siete días. **Conclusiones:** el sobreuso de antibacterianos por los odontólogos del Ecuador representa un problema importante que puede estar relacionado con desarrollo de resistencia bacteriana y aumento en los costos de atención. La implementación de protocolos de tratamiento puede ayudar, así como la educación continua sobre el uso de tratamiento antibacteriano.

Palabras clave: manejo de infecciones, sobreuso de fármacos, odontología, patrones de prescripción, absceso periapical, absceso periodontal.

INTRODUCTION

The dental profession is unique among the various types of health care providers in that, in most instances,

the dental practitioner alone is responsible for performing a diagnosis, determining treatment options, and performing the chosen treatment. Variations have been found among dental practitioners regarding diagnosis and treatment of dental caries,^{1,2} periapical lesions,^{3,4} third molars,^{5,6} and malocclusions,⁷ as well as differences in antibiotic prescription habits after endodontic treatment,⁸ and extractions.⁹ This variation can be explained by differences in culture, patient preferences, treatment methods, the prevalence of disease, and practitioner to patient ratio, available resources, reimbursement systems, post-graduation education, and the existence and application of clinical guidelines.¹⁰ The empirical and broad use of antibiotic prophylaxis is no longer acceptable, but details on responsible prescribing remain problematic.¹¹ In the dental community, there has been a general trend toward over-prescribing.^{12,13} One of the surveys in the USA found that only 39% of dentists and 27% of physicians followed guidelines for antibiotic prophylaxis appropriately.¹⁴ Many practitioners rely on the recommendations of other practitioners – who often cite anecdotal evidence– or decide that when in doubt, the wise and conservative course is to prescribe.¹⁵ In Ecuador, there are 2.5 dentists per 10,000 habitats. They came from fifteen Schools of Dentistry nationwide, but nine of them are located in the three main cities (Quito, Guayaquil, and Cuenca). Pharmacology is reviewed in all undergraduate programs, but no further updates on this matter are available. Furthermore, there are no local guidelines or protocols for the treatment of infectious diseases in the oral cavity. Therefore, this study aimed to investigate the prescription patterns for antibacterial drugs among Ecuadorian dentists.

MATERIAL AND METHODS

Between February and May 2014, a knowledge, attitudes, and practices self-designed survey consisting of eight questions, that were previously validated among other professors at the School of Dentistry, was applied to a representative number of dentists (based on a sample size calculation equation) from different cities in Ecuador (Quito, Guayaquil, Cuenca, Santo Domingo, Ibarra, Loja, Manta and Portoviejo; *Figure 1*). Surveys were done by direct interview at each dentist’s office and after explaining to them the objective of the study and answering any questions they might have. The survey requested information about the city where they practice and whether they were general practitioners or specialists and the university they graduated from and the year

they got their degree. The survey placed two clinical scenarios to choose from to treat either one of them, which in this case were an acute, periapical abscess or an acute periodontal abscess. The main purpose behind the survey was to find out what the treatment for this condition was from the point of view of each professional regardless of the pathology they choose. The clinical condition was only a set point to target treatment. There was no right or wrong answer, the purpose was to evidence the treatment that the professional was going to apply, and if it involved the use of antibiotics. If the treatment included the use of antibiotics, the name of the drug was requested, the dosage, regimen, and duration of the treatment as well as if they use any prophylactic antibiotic therapy. Data was introduced into an electronic database and later analyzed using the statistical package GraphPad InStat version 3.00 (GraphPad Software, San Diego, CA, USA).

RESULTS

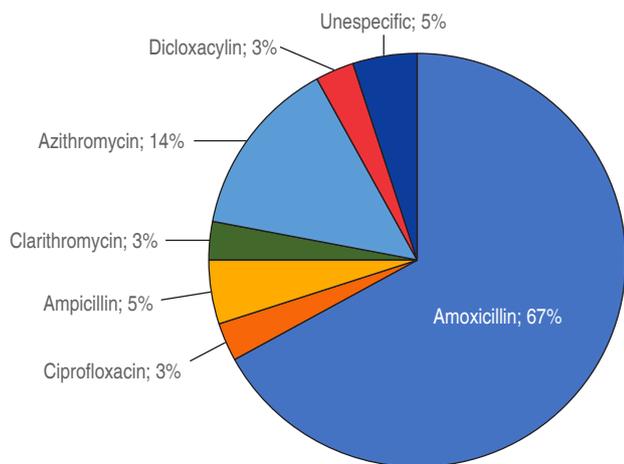
A total of 307 dentists accepted to participate in the survey and their distribution by the city of work is shown in *Table 1*. Of those, 76.2% graduated from a public university and only 32.9% had a specialist



Figure 1: Geographical distribution of the dentist participating in this survey.

Table 1: Distribution of the sample of dentists in Ecuador who participated in the study.

City	n (%)
Quito	98 (31.9)
Guayaquil	72 (23.4)
Cuenca	52 (16.9)
Santo Domingo	30 (9.8)
Ibarra	12 (3.9)
Loja	15 (4.9)
Manta	14 (4.6)
Portoviejo	14 (4.6)

**Figure 2:** Empirical use of antibacterial for periapical abscess treatment by dentists in Ecuador.

degree. Two hundred and twenty (84.4%) participants choose the periapical abscess, and 42% (n = 93) mentioned antibiotics as the first option treatment. Among antibiotics, the most commonly used is amoxicillin, either alone or combined with clavulanic acid (67%) while 12% preferred not to mention an agent (Figure 2).

Of the remaining participants (n = 48; 15.6%) who selected periodontal abscess only 56% mentioned drainage and endodontic treatment as the first choice. So, of those using antibiotics (n = 21), 52% mentioned amoxicillin either alone or with clavulanic acid, followed by azithromycin (24%), ampicillin plus sulbactam (10%); and cephalexin and ciprofloxacin (5% each). There was an additional 5% of participants did not mention an agent.

Amoxicillin used in a proper dose of 500 mg was found only in 72.7% of participants, while once combined with clavulanic acid in a dose of 625 mg was mentioned by 64% of the dentist. Finally, only 62.6%

of survey dentists used an appropriate schedule (e.g. every 8 hours for amoxicillin) and 85.4% suggested an adequate duration of treatment (i.e. not only a single dose).

DISCUSSION

Along with analgesics, antibiotics are the most commonly prescribed medications by dentists, accounting for 7% of all community prescriptions.¹⁶ Furthermore, antibiotics prescription is empirical, i.e., the clinician does not know what microorganism is responsible for the infection, since pus or exudate cultures are not commonly made. Based on clinical and bacterial epidemiological data, the germs responsible for the infectious process are suspected, and treatment is decided on a presumptive basis, based on probabilistic reasoning.¹⁷ In this sense, this study is reporting for the first time that the overuse of antibacterial drugs by dentists in Ecuador is a real problem.

In our study, there were no differences in the percentage of overuse of antibiotics between general dentists and those with a specialization (around 50% each). This contrast with another report that suggested that the criteria of antibiotic prescription are connected to the level of education that the professional has because there was a difference between a general practitioner and a postgraduate dentist.¹⁰

In this report, using two different clinical scenarios that were chosen voluntarily by participants, it was found that less than half of dentists properly manage the hypothetical case without antibacterial drugs. Even worse, of those overusing antibacterial drugs, between 60 and 80% knows the adequate dose, schedule, and treatment duration. Studies have shown that the use of an antibiotic is not necessarily the end of a post-operative complication due to infection, during dental procedures, such as oral surgery or endodontic therapy.¹⁰ There is then, a huge possibility that due to this antibacterial drug overuse is responsible for the future development of resistant strains.

This issue might be overcome by using guidelines to follow when treating patients who may be suffering from an infection due to a dental complication, but it is not an easy task, as there are differences between protocols in different countries and even in the same territory when treating complications such as bacterial endocarditis.¹³

Here it is reported, in agreement with other studies, that amoxicillin tends to be prescribed to healthy patients because it is a normal practice to do it.¹⁰ Although we applied this survey to a representative

number of dentists from different cities in Ecuador, recognize as a weakness that a questionnaire is not the most efficient form of finding the real effects of incorrect use of antibiotic drugs.¹⁸

CONCLUSION

In conclusion, the overuse of antibacterial drugs by Ecuadorian dentists represents an important problem and urges the implementation of guidelines for antibacterial drugs use, as well as the necessity of continuous educational activities on the use of antibacterial drugs.

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