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Antibiotic therapy in Endodontics: a survey from dental surgeons in Ivory Coast

KEYWORDS

Antibiotic therapy,
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PAROLE CHIAVE

Terapia antibiotica,
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Terapia antibiotica in Endodonzia: un sondaggio dai chirurghi odontoiatrici in Costa D'Avorio.

Abstract

Aim: The objective of this study was to evaluate the antibiotics prescription in endodontics.

Methodology: This was a descriptive cross-sectional survey, type KAP (Knowledge, Attitudes and Practices) of 111 dental surgeons in Abidjan (Ivory Coast).

Results: 11.70% of practitioners routinely prescribe antibiotics for endodontic treatment; 64.90% prescribe them for Acute Apical Periodontitis, 57.70% for Pulp Necrosis and 52.30% for Abscess. According to the patient general condition, practitioners prescribe antibiotics for general illness (89.20%) or poor hygiene (55%). beta-lactam antibiotics are prescribed in 98.20% of cases. For 96.4% of practitioners, antibiotic therapy influences an endodontics success; 19.80% do not know about prescription recommendations; 37.80% have received antibiotics self-medicated patients.

Conclusion: In Ivory Coast, the antibiotics prescription in endodontics does not always adhere to international recommendations. The anarchic consumption of these drugs is mostly due to self-medication.

Obiettivi: L'obiettivo di questo studio è stato quello di valutare la prescrizione degli antibiotici in endodonzia.

Metodi: Questo è stato un sondaggio descrittivo trasversale, tipo KAP (Conoscenza, Atteggiamenti e Pratiche) di 111 dentisti a Abidjan (Costa d'Avorio).

Risultati: L'11,70% dei professionisti prescrive abitualmente antibiotici per il trattamento endodontico; il 64,90% li prescrive per la parodontite apicale acuta, il 57,70% per la necrosi della polpa e il 52,30% per l'ascesso. Secondo le condizioni generali del paziente, i medici prescrivono antibiotici per la malattia generale (89,20%) o scarsa igiene (55%). Gli antibiotici beta-lattamici sono prescritti nel 98,20% dei casi. Per il 96,4% dei professionisti la terapia antibiotica influenza il successo dell'endodonzia; il 19,80% non è a conoscenza delle raccomandazioni di prescrizione; il 37,80% ha ricevuto pazienti che si sono auto-medicati.

Conclusioni: In Costa d'Avorio la prescrizione di antibiotici in endodonzia non sempre rispetta le raccomandazioni internazionali. Il consumo anarchico di questi farmaci è dovuto principalmente all'automedicazione.

Introduction

Endodontic therapy is one of the most commonly performed procedure in dentistry, especially in Africa, due to late consultations mainly motivated by pain (1, 2). It is performed in irreversible dental pulp diseases and their periodontitis complications when

the tooth can be recovered. When treating endodontic infections, antibiotic therapy may be recommended as curative, complementing conventional root canal treatment. Actually, in this treatment, the antibiotic is just an adjuvant and not an alternative to canal cleaning or re-cleaning and pus or exudate drainage (3). Antibiotics are micro-organism natural substances derived or

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synthetic or semi-synthetic produced in laboratory which have low-level dosing of antimicrobial activity (4). They help slowing down and eliminating more quickly the infectious process of the body and thus, to prevent more serious complications. Therefore, do several authors only consider curative antibiotic therapy in endodontics, regardless of the patient infectious level of risk, for the following cases: infection with fever, trismus, lymphadenopathy, progressive or persistent edema (4, 5, 6, 7). Despite these indications, antibiotics are among the most commonly prescribed drugs, unnecessarily or inappropriately sometimes, resulting in the growth of antibiotic-resistant bacterial strain (8, 9).

In an epidemiological and infectious context different from that of northern countries, endodontics practice in Africa is also tainted by bad habits regarding, in particular, antibiotic therapy. Indeed, Azodo and Ojehanon in Nigeria highlighted deficiencies in prophylactic antibiotic treatment and antibiotic therapy choices (10). In 2017, Lalloo carried out a survey on the endodontic drug intake profile which, also ranked these drugs among the most used drugs in South Africa (8). Moreover, their prescribing guidelines are still not always followed and self-medication is very common (11, 12, 13, 14).

The objective of this study was to assess the antibiotic prescription during endodontic therapy, based on a survey of general dental surgeons in the district of Abidjan (Ivory Coast).

Methodology

It was a descriptive, cross-sectional survey on the knowledge, attitudes and practices on antibiotics prescription in endodontics of dental surgeons in the city of Abidjan. It lasted three months, from June 2017 to August 2017. The sample was randomly selected from the National Council of the College of Dental Surgeons of Ivory Coast list (NC-CDSIC/in French: CNOCDI) (15).

Private and public dentists practicing in the city of Abidjan were included. Specialists were excluded. An anonymous survey form with four sections, as follows, was used to collect data: sample characteristics, practitioners' knowledge of endodontics therapy, antibiotics prescription in endodontics therapy and self-medication. After validation, the questionnaire being self-administered, available retained practitioners who met the inclusion criteria were given cards. Appointments were made for exchanges and recovery of said cards. The collected data was processed with SSPS 21.0.

Results

Of the 150 cards distributed, 111 were recovered and processed.

Sample characteristics: the sample includes 66 private sector practitioners (59.46%) and 45 (40.54%) from the public sector, where there are 73% male for 27% female (sex ratio 2.7). 48.64% of respondents have between 0 and 5 years of professional seniority.

Practitioners' knowledge of endodontic therapy: all respondents claimed having performed this treatment. Altogether, 29.73% of practitioners make more than 15 endodontic treatments per month. Clinical indications are: Acute Pulpitis (99.10%), Chronic Pulpitis (99.10%), Pulp Necrosis (91%), prior failed Endodontic Treatment (75.70%), Acute Apical Periodontitis (AP) (73.00%), Apical Abscess (45.90%), Chronic AP (34.20%), Pre Pulpitis (32.40%). 69.40% of practitioners routinely perform retroalveolar radiography, 30.60% do not.

Antibiotics prescription during endodontic therapy: on average, 11.70% of practitioners routinely prescribe antibiotics. Other methods of prescription are shown in figures 1, 2, 3 and 4 and table 1. For 96.40% of practitioners, antibiotics prescriptions contribute to an endodontics success and 80.20% have knowledge of international recommendations.

Self-medication: 96.40% of respondents reported having received self-medicated patients for endodontic care. 37.80% used antibiotics. According to 65.80% of respondents, self-medication could hinder the endodontic therapy.

Discussion

This survey identified the knowledge, attitudes and practices of 111 out of 150 dental surgeons who agreed to participate in the study with a participation rate of 74%. General practitioners have been the focus of this study.

In Ivory Coast, even if the number of public dental surgeons is higher than that of the private, some of the first are public servants; moreover, the number of practitioners per chair in offices is three for one. These reasons could explain the business sector's results. Other characteristics are the reflection of the dental surgeons general population on the NCCDSIC (French CNOCDI) board (15).

This study interviewed practitioners claimed having performed this treatment. Even though frequencies seem disparate, 29.73% perform more than 15 procedures

per month. This highlights the importance of endodontics in Ivory Coast. Most respondents use it to treat irreversible dental pulp diseases and their inflammatory periapical complications and also, for a faulty endodontic treatment. In infectious complications, proportions, although important, decrease for the endodontic option probably in favor of radical surgery. These therapeutic choices are consistent with the literature data on pulpal pathologies (16).

When faced with such infectious complications, only an infectious risk related to the patient's general condition or when the tooth reconstitution is not possible, may force the dental surgeon to remove it. Yet, in this study, less than half of the sample reported doing endodontic treatment in these cases. 12.60% of dental offices do not have the radiography, essential therapeutic device in endodontics. The critical part is that 30.60% of practitioners do not routinely perform radiography during endodontic treatment.

This study showed that 11.70% of practitioners routinely prescribe an antibiotic during root canal treatment. Although most of them (88.30%) do it just sometimes because of the diagnosis and/or the patient overall conditions; it is also found in the study of Souaga in Ivory Coast, that some of these prescriptions are without any rational and even unreasonable (11). With good reason, compared with the diagnosis (figure 1), the only pathology for a justified antibiotic prescription, regardless of the therapy to be used, is the Apical Abscess, which is a case of proven infection. However, only 52.30% of respondents recommend anti-infectious treatment in this condition. This suggests that some dentists perform endodontics without antibiotic therapy in this case.

Prescription peaks are observed with Acute Apical Periodontitis (64.90%) and necrosis (57.70%). These behaviors do not comply with the European Society of Endontology (ESE) guidelines (3). They are even less for prescriptions in cases of acute and chronic pulpitis, en-

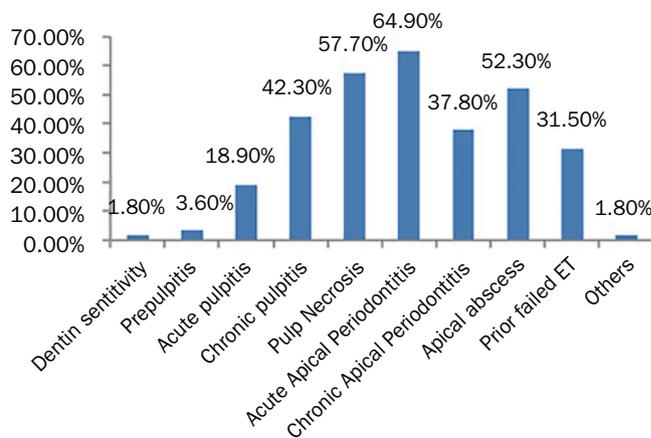


Figure 1
Antibiotics prescription according to the diagnostic type
(ET = Endodontic Treatment).

Table 1

Sample distribution according to prescribed antibiotics types

Antibiotics types	Number (n)	Percentage (%)
Beta-lactams	109	98.20
Cyclin	1	0.90
Macrolides	60	54.10
Synergistins	0	0.00
Nitro-5-imidazoles	76	68.50
Others: amoxicillin/Clavulanic acid spiramycin/metronidazole	11	9.90

dodontic retreatment and in the pre-pulpitis status (figure 1). Overall, these findings confirm the inadequacies and abuses in antibiotic prescriptions as noted by many authors worldwide (7, 17, 18, 19).

In practice, respondents prescribe mainly for general illness (89.20%) and poor oral hygiene (55%) (figure 2). But

there again, it is about unreasonable prescription because not all general diseases increase the risk of infection (3). In addition, antibiotic therapy is not the solution for poor oral hygiene. However, due to the lack of dental rubber dam in practices in Ivory Coast, antibiotic therapy after endodontics can be implemented in case of contamination by saliva to prevent a post operative flare-up. This could justify the attitude of 34.20% dental surgeons who prescribe antibiotic therapy after the procedure (figure 3). 75% of practitioners prescribe antibiotic therapy during treatment (figure 3). The explanation of this practice is to be found in the answer to the question “influence of antibiotic prescription on therapeutic success” nearly all (96.40%) agreed on that antibiotic therapy guarantees therapeutic success in endodontics. Unlike Azodo and Ojehanon in Nigeria who have found more prescriptions of the combination amoxicillin/metronidazole and Hwang and Iqbalin in Saudi Arabia with more amoxicillin and clavulanic acid, this study shows a preference for beta-lactams (98.20%) as first-line prescription (table 1) (10, 1, 18). These results are also comparable, on one hand, to those of Germack & al. in United States and Bolfoni & al. in Brazil who have all evaluated endodontics prescriptions (20, 17). On the other hand, findings of Segura & al. and Skucaité & al., respectively in Spain and Lithuania, have also indicated amoxicillin as the first choice of general practitioners (4, 7). Lalloo from South Africa found similar data in endodontic prescriptions (8). In this study, Nitro-5-imidazoles (68.50%) and macrolides (54.10%) are respectively at the second and third place (table 1). The relative low cost of β -lactams, their good tolerance and, above all, their broad spectrum of activity, justify their choice compared with macrolides. Nitro-5-imidazoles, just like the Clavulanic Acid, are generally associated with first-line molecules because of the anaerobic bacteria fre-

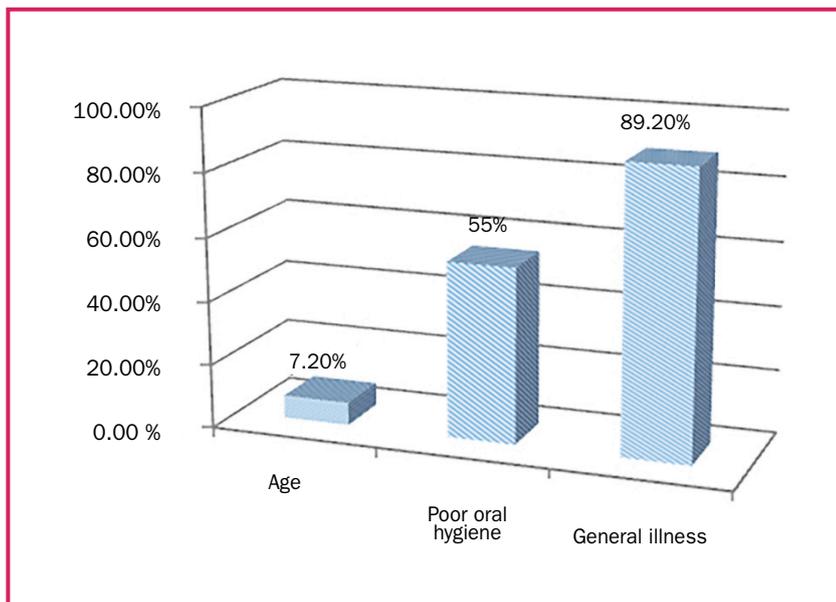
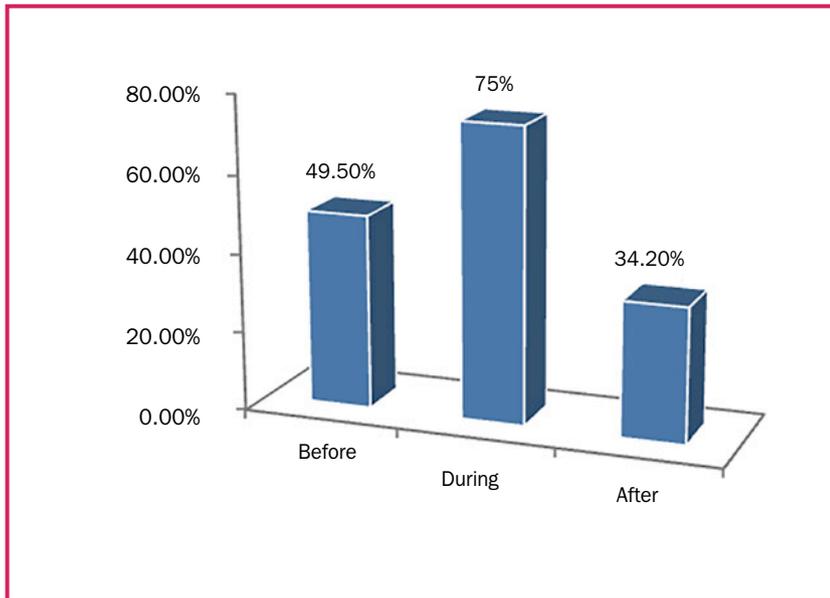


Figure 2

Antibiotics prescription according to the patient oral hygiene and general status.

**Figure 3**

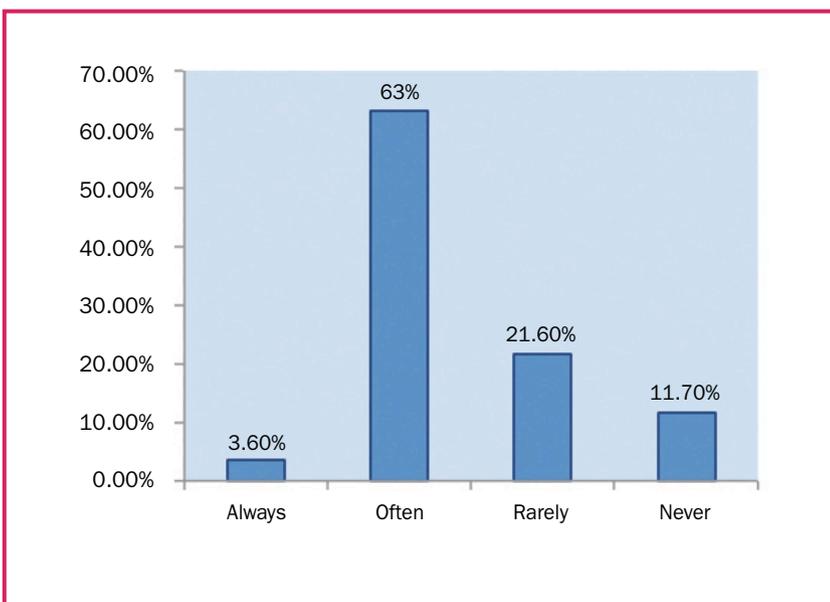
Sample distribution according to prescription time during endodontic treatment.

quency in abscesses. But, their use should be for severe case. Moreover, the ESE recommends them as second-line prescription. This study shows an excessive (63.10%) or insufficient (11.70% never make an association of antibiotics) use of association (figure 4). Paradoxically, nearly 90% of sur-

veyed practitioners are aware of international guidelines for antibiotics prescriptions.

Medication use should be prescribed by a health professional. Unfortunately, this can be the decision of the patient without the practitioner's opinion, as a self-medication. Prescription provides utilization security, even if it has been found to be abusive by practitioners. Self-medication is another important factor in the unreasonable use of drugs in general and antibiotics in particular. It is found everywhere in the world, but with higher frequencies in Africa (2, 8, 11). This study showed that 96.40% of surveyed practitioners have experience with self-medicated patients. Non-steroidal anti-inflammatory drugs are used in 90% of cases, followed by analgesics (54.10%). Antibiotics ranked third with 37.80%.

These rates are important considering the consequences of this practice. Laloo found 28.6% self-medication with 14% for antibiotics in South Africa (8). Likewise, Souaga et al., in Ivory Coast, interviewing 418 patients attending dental consultations, noted a rate of 37.32% cases of self-medication with 10.08% for antibiotics (11). In contrast to these two authors who surveyed patients, this study focused on practitioners. Consequently, the different results obtained could be related to the methodology used. In all cases, this practice should be denounced and it could hinder the endodontic therapy by 65.80% of respondents. In addition, this phenomenon is a source of resistance to antibiotics, over-consumption of potentially toxic products for the human body and expenses for insurance providers and households. Self-medication is mostly due to the anarchic black market, the trivialization of prescriptions (prescribers of unequal level of knowledge), the abundance of generics, the improper practices, the ignorance of side effects and the absence of a monitoring system of antibiotics use in sub-Saharan Africa.

**Figure 4**

Sample distribution according to prescription of antibiotics combination.

Conclusions

In Ivory Coast, antibiotics prescription in endodontics not always meet international guidelines. In addition, self-medication is an important part of the uncontrolled consumption of these drugs.

Clinical Relevance

This work makes it possible to draw the general practitioner's attention to inappropriate antibiotic prescriptions,

which could be the causes of antibiotic resistance.

Conflict of Interest

The authors declare no potential conflict of interests.

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