



Journal home page: <http://www.journalijar.com>

INTERNATIONAL JOURNAL
OF INNOVATIVE AND APPLIED RESEARCH

RESEARCH ARTICLE

Article DOI:10.58538/IJAR/2126

DOI URL: <http://dx.doi.org/10.58538/IJAR/2126>

PAIN MANAGEMENT DURING EMERGENCY ENDODONTIC CARE

AndrianjafinoroTsiriniaina Hasinjanahary¹, RandriamalalaNjarasoa Charlette¹, LalanirinaGaëlLauricia¹,
AndrianirinaLudjet José Michel² and Ramaroson Juvence³

1. Former Intern in Odontostomatology.
2. Odontostomatologist.
3. Associate Professor in Odontostomatology.

Manuscript Info

Manuscript History

Received: 18 February 2025
Final Accepted: 23 March 2025
Published: March 2025

Abstract

Endodontic emergencies represent a significant portion of the daily consultations of Odontostomatologists (OS). The main objective of this study was to evaluate the management of pain during emergency endodontic care among OS practitioners in the city of Mahajanga. This was a descriptive, retrospective, cross-sectional study conducted from June 2023 to October 2024. The evaluation required a survey form concerning operative procedures and prescribing habits, which was completed during each interview. The data were processed using SPSS 20.0 software for Windows. The sample consisted of 40 odontostomatologists. The results showed that 7.5% of OS adhered to recommendations in accordance with the norms in the literature for pulp hyperemia. This proportion was 57.5% for irreversible acute pulpitis, 32.5% for acute apical periodontitis, 5% for acute apical abscess, and 17.5% for cellulitis. The management of endodontic emergencies revealed that few OS practitioners implemented therapeutic approaches consistent with the recommendations in the literature. Further studies conducted in other cities in Madagascar would be desirable to assess the quality of endodontic emergency management.

*Corresponding Author:-AndrianjafinoroTsiriniainaHasinjanahary, Former Intern in Odontostomatology.

Introduction:-

In Endodontics, an emergency is characterized by the occurrence of a painful pathological condition that requires immediate management; it can be inflammatory or infectious in nature.

Among the reasons for consultations in dental offices, endodontic emergencies represent a significant portion. In Burkina Faso, Kaboréandal. (2021) revealed that 51.54% of oral-dental emergencies were of endodontic origin [1]. Similarly, a study conducted by Tariq and al. (2022) showed that 57% of patients received at the Quamar Dental Hospital in Pakistan presented cases of endodontic emergencies [2]. Franciscoandal. conducted a study involving 1,481 emergency patients, among whom 927 reported pain of pulpal origin. The most common diagnosis was irreversible pulpitis (563 cases), followed by pulpal necrosis (173 cases) and reversible pulpitis (191 cases) [3].

Despite their importance, discrepancies in practices have been observed among practitioners, particularly in pain management and compliance with clinical guidelines. According to a cross-sectional descriptive study conducted in Dakar among Odontostomatologists (OS), it was noted that OS adhering to therapeutic norms did not exceed 30% [4]. The complexity of the intervention, potential complications during treatment, and the occurrence or persistence of pain during and after the operation are sources of concern for OS, especially when the primary goal of the treatment is to relieve the patient [5].

In Madagascar, few studies have been conducted to evaluate the management of pain in endodontic emergencies. This study was carried out among Malagasy OS to address the following research question: How do OS manage pain during emergency endodontic care?

The management of pain during emergency endodontic care in dental offices follows the norms mentioned in the literature.

The general objective of this study is to evaluate the management of pain in endodontic emergencies among OS practitioners in the city of Mahajanga.

The specific objectives are to:

- Describe the sociodemographic profile of the surveyed OS practitioners;
- Determine the frequency of endodontic emergencies;
- Identify the approaches taken by OS practitioners in response to endodontic emergencies.

Materials and Methods:-

Type of study:

descriptive, retrospective, cross-sectional study

Study period:

This study conducted from June 2023 to October 2024 in the city of Mahajanga, Madagascar.

Study population:

The study population consisted of 40 OS registered with the national board of Odontostomatologists of Madagascar and practicing in the city of Mahajanga. A simple random sampling method was chosen to form the sample.

Inclusion criteria:

All OS who performed endodontic care were included in the study,

Exclusion criteria:

while non-cooperative OS who refused to participate in the survey were excluded.

Data collection and analysis:

An anonymous pre-established, tested, and validated questionnaire was developed to collect information. The following elements and data were recorded:

- Social characteristics (gender, age, place of practice, years of practice)
- Initial training location (Madagascar, abroad)
- Types of endodontic emergencies encountered (pulp hyperemia, irreversible acute pulpitis, acute apical periodontitis, acute apical abscess, cellulitis of endodontic origin)
- Procedures selected to address endodontic emergencies (indirect pulp capping, direct pulp capping, biopulpotomy, biopulpectomy, cleaning and canal medication, dental occlusion relief, open drainage, mucosal incision, open drainage and mucosal incision, extraction, others)
- Medication prescriptions for endodontic emergencies (analgesics, antibiotics, anti-inflammatory drugs)

Information collection was carried out through individual interviews. The data were processed and analyzed using SPSS 20.0 software. This study consisted of a descriptive analysis of the social characteristics of the study population and the type of pain management during emergency endodontic care. Due to the low representativeness of the sample, no statistical tests were performed to evaluate the association of variables, as the conditions for application were not met.

Ethical considerations :

Informed consent was obtained from the OS interviewed after clearly explaining the objectives of the study. The confidentiality of information, professional secrecy, and privacy of the investigation participants were respected.

Conflict of Interest Statement:

The authors declare that they have no conflicts of interest.

Results:

Table I: Social Characteristics of the Sample.

social characteristics	N	%
Gender		
Male	23	57,5
Female	17	42,5
Total	40	100
Age		
25 to 34 years	10	25,0
35 to 44 years	14	35,0
45 to 54 years	9	22,5
55 years and older	7	17,5
Total	40	100
years of practice		
10 years or less	13	32,5
11 to 20 years	18	45
21 to 30 years	5	12,5
More than 30 years	4	10
Total	40	100
Practice sector		
Private	31	77,5
Public	9	22,5
Total	40	100

Tableau II : Distribution of OS according to the most frequently encountered types of endodontic emergencies.

Type of endodontic emergency	N	%
pulp hyperemia	1	2,5
acute pulpitis	25	62,5
acute apical periodontis	12	30
Acute apical abscess	1	2,5
cellulitis of endodontic origin	1	2,5
Total	40	100

Table III:- Distribution of OS Based on Medication Prescription and their Actions taken for Pulp Hyperemia.

actions taken for pulp hyperemia	N	%
direct pulp capping	15	37,5
indirect pulp capping	3	7,5
Biopulpotomy	3	7,5
Biopulpectomy	16	40
Extraction	1	2,5
Other	2	5
Total	40	100
Medication prescription		
Yes	16	40
No	24	60
Total	40	100

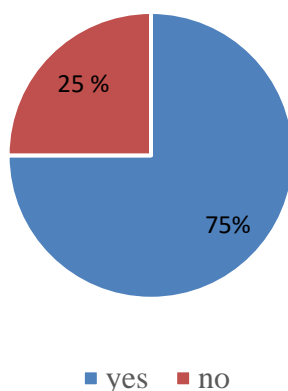


Figure 1:- Distribution of OS Based on Pain Assessment in Cases of Endodontic Emergencies.

Table IV:- Distribution of OS Based on Actions taken and Medications Prescribed for Irreversible Acute Pulpitis.

actions taken for acute pulpitis	N	%
Direct pulp capping	2	5
Indirect pulp capping	1	2,5
Biopulpotomy	6	15
Biopulpectomy	23	57,5
Nécropulpectomy	3	7,5
Extraction	3	7,5
other	2	5
Total	40	100
Medications prescribed		
Analgesics		
Yes	26	96,3
No	01	3,7
Total	27	100
Antibiotics		
Yes	15	55,5
No	12	44,5
Total		
Anti-inflammatory drugs		
Yes	01	03,7
No	26	96,3
Total	27	100

Table V:- Distribution of OS Based on Actions Taken and Medications Prescribed for Acute Apical Periodontitis.

Actions taken for acute apical periodontitis	N	%
Trimming and root canal medication	13	32,5
Under-occlusion of the tooth	1	2,5
Open drainage	21	52,5
Extraction	5	12,5
Total	40	100
Medications prescribed		
Analgesics		
yes	34	89,5
No	04	10,5
Total	38	100
Antibiotics		

Yes	37	97,4
No	01	03,6
Total	38	100
Anti-inflammatory drugs		
Yes	03	07,9
No	35	92,1
Total	38	100

Table VI:- Distribution of OS Based on Actions Taken and Medications Prescribed for Acute Apical Abscess.

Actions taken for acute apical abscess	N	%
Open drainage	32	80
Mucosal incision	2	5
Extraction	4	10
Open drainage and Mucosal incision	2	5
Total	40	100
Medication prescribed		
Analgesics		
Yes	34	89,5
No	04	10,5
Total	38	100
Anti-inflammatory drugs		
Yes	01	3,6
No	37	96,4
Total	38	100
Antibiotics		
Yes	38	100
No	00	00
Total	100	100

Table VII:- Distribution of OS Based on Actions Taken and Medications Prescribed in Cases of Cellulitis.

Actionstaken in cases of cellulitis	N	%
Open drainage	13	32,5
external mucosaldrainage	8	20
Open drainage and external mucosal drainage	7	17,5
Referral	12	30
Total	40	100
Medicationsprescribed		
Analgesics		
Yes	38	95
No	02	05
Total	40	100
Anti-inflammatory drugs		
Yes	01	97,5
No	39	02,5
Total	40	100
Antibiotics		
Yes	39	97,5
No	01	02,5
Total	40	100

Discussion:-

Types of Emergencies in Endodontics

Endodontic emergencies are a common situation in dental practices. Pulpal and periradicular pain are the main causes for seeking emergency care.

In the present study, acute pulpitis was the most frequent emergency, accounting for 62.5%, followed by apical periodontitis at 30%. This proportion was significantly higher than the one reported by Kaboré and al. in 2021, where they observed a 44.8% incidence of irreversible acute pulpitis [6].

Regarding pain assessment, 75% of the odontostomatologists surveyed evaluate pain during endodontic emergencies (Figure 1). This suggests they consider pain assessment an important part of their clinical practice in the context of endodontic emergencies. This evaluation helps to understand the nature, intensity, and location of the pain, allowing the selection of the most appropriate treatments and adjusting medication doses to meet the individual needs of the patient.

Management of Endodontic Emergencies

Pulpal Hyperemia (Table III)

According to the literature, the recommended treatment for pulpal hyperemia is indirect pulp capping [7]. However, in this study, the majority of practitioners performed biopulpectomy (40%), with an equal proportion observed for biopulpotomy and direct pulp capping (37.5%), and 2.5% of OS performed extractions. An analysis of therapeutic decisions for the urgent management of pulpal hyperemia revealed that only 7.5% of surveyed odontostomatologists adhered to emergency treatment standards.

In a similar study conducted in Dakar by Bane and al. in 2013, only 2.8% of OS adopted appropriate actions for pulpal hyperemia [8]. Furthermore, medication prescription—whether antibiotics, non-steroidal anti-inflammatory drugs, or analgesics—is not necessary for this type of emergency [19]. Yet, 40% of surveyed OS prescribed medications for pulpal hyperemia, which does not comply with recommended guidelines. This proportion is relatively lower compared to that observed by Bane and al. in 2013, where a higher medication rate of 83% was recorded [8].

Irreversible Acute Pulpitis (Table IV)

In the literature, the recommended treatment for irreversible acute pulpitis is preferably biopulpectomy or biopulpotomy [7]. In this study, 57.5% of OS adhered to best practices for the management of irreversible acute pulpitis (Table IV). This proportion is higher compared to Bane's (2013) study, where only 38.7% of practitioners followed scientific society recommendations, which advocate that the adequate treatment for pain control involves anesthetizing the tooth and completely removing the pulp tissue (biopulpectomy). Additionally, a study by Bidar and al. (2011) reported that 27.5% of OS opted for pulpotomy, and 37.5% for biopulpectomy in cases of irreversible pulpitis without apical periodontitis, while most endodontists (84.3%) preferred biopulpectomy [9].

An analgesic prescription may be recommended for acute pulpitis [19]. Among the surveyed odontostomatologists (OS), 96.3% reported following this practice, compared to 32.5% who do not prescribe any medication. This prescription may be influenced by the therapeutic choice depending on the emergency case and the experience acquired during practice. Additionally, 55.5% mentioned antibiotic therapy for irreversible acute pulpitis, although this treatment is only necessary in cases of infection.

Non-compliance with prescription norms has been noted since the year 2000. Yingling and al., in 2002, observed a rate of 16% antibiotic prescription for pulpal inflammation, which was already concerning but relatively low [10]. These data highlight a growing trend in the inappropriate prescription of antibiotics for inflammatory, non-infectious conditions. This may be explained by a lack of understanding regarding the proper use of antibiotics, which persists despite recommendations established since 2000 and now exacerbates the prevalence of antibiotic resistance.

The proportion of cases with penicillin resistance has increased from 5% in 1998 to 55% in 2008. Antibiotics have been overused and misused in the past, with many dentists and endodontists inappropriately employing them for pain management instead of reserving them for situations where they are truly indicated, namely infections with systemic manifestations [11].

Acute Apical Periodontitis (Table V)

In the literature, the recommended treatment for acute apical periodontitis is debridement accompanied by canal medication and relieving the tooth from occlusion [10]. The results of this study showed that only 32.5% of the surveyed odontostomatologists (OS) managed it correctly. Open drainage is prioritized only in cases of abscesses [9]. However, 52.5% of the surveyed OS opted for this method.

The prescription of an analgesic is recommended and was reported in 89.5% of OS, a significantly higher proportion compared to the study by Bidarandal. in 2015, which found a proportion of 21.6% [9].

Additionally, the excessive use of antibiotics and the emergence of antibiotic-resistant bacterial strains are global concerns, particularly in the oral environment [12]. However, this study reports a 97.4% rate of antibiotic prescriptions for acute apical periodontitis. It is noted that antibiotic prescriptions are unnecessary for this type of emergency except for patients at high risk of infection [7].

The Vienna study reports a much lower proportion of 31.7% [12]. A similar study by Rodriguez-Nuñezandal. in 2009 found a proportion of 52.9% [13].

Acute Apical Abscess (Table VI)

The emergency management of acute apical abscess involves performing canal drainage along with prescribing antibiotics [7]. The majority of surveyed OS (80%) performed open drainage, and 10% of OS proceeded with an extraction. In addition to these therapeutic measures, 89.5% of OS prescribed analgesics. Moreover, all OS prescribed antibiotics, which aligns with recommended guidelines.

Based on these results, the frequency of antibiotic prescriptions is high compared to the study by Mainjotandal. in 2009, which revealed a proportion of 51.9% for antibiotic prescriptions [14]. Only 3.6% prescribed Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), as NSAID medication is considered dangerous, especially when not accompanied by antibiotic therapy. This is because it can promote the spread of infection in the periapical region, leading to complications such as cellulitis.

Dental Cellulitis of Endodontic Origin

The initial treatment aims to address the cause of the infection, often of dental origin. According to the literature, probabilistic antibiotic therapy is required as soon as the emergency consultation occurs. Among the studied sample, 97.5% of OS prescribed antibiotics, reflecting a widespread understanding of the necessity to combat the spread of the underlying infection. Additionally, 95% of OS prescribed analgesics, highlighting that pain management is a priority in the treatment of cellulitis. Only 2.5% of OS opted to prescribe anti-inflammatory drugs. This low prescription rate could be explained by the risks associated with using NSAIDs without accompanying antibiotic therapy.

The treatment also includes surgical drainage of cellulitis, adjusted according to the clinical stage and the involvement of the causal tooth. This drainage can range from simple trepanation to tooth extraction. Trepanation allows for the wide opening of the pulp cavity and draining of the apical focus while preserving the tooth. The results of the present study revealed that 32.5% of OS opted for open drainage, 20% chose external mucosal drainage—this technique can be employed when the infection is localized in a way that allows effective access through the mucosal tissues—and 30% referred the case to a specialist. This decision may be motivated by the complexity of the treatment or the need for more specialized care.

Conclusion:-

Pain management during emergency endodontic care represents a major challenge for odontostomatologists. The practices of OS in managing endodontic emergencies have shown discrepancies. This study revealed that while some OS adhere to recommendations for certain endodontic emergencies, significant gaps remain, and a large number of OS have not followed therapeutic standards. This highlights the need for increased awareness and continuous training to improve compliance with clinical standards.

Therefore, it would be beneficial to conduct further studies in other cities of Madagascar with representative samples to evaluate and enhance the quality of emergency endodontic care in Madagascar.

References:-

- 1- Bane K, Leyé-Benoist F, Aidara AW, Tahir MC, Touré B.(2018) : Attitude of Dentists in the Dakar Region Towards Endodontic Emergencies. Department of Dentistry, Conservative Dentistry and Endodontics, Cheikh Anta Diop University of Dakar – Senegal, 35.
- 2- Eleazer PD, Rosenberg PA. (2016) : Emergencies and Their Treatments in Endodontics. 72–82.
- 3- Francisco SF, Furtado AP, Porto DN, Carvalho DA, Fleury EDM. (2008) : Survey of Dental Appointments in the Dentistry Program at UniEvangélica. Revista da FOA,10(8):86-92.
- 4- Romieu G, Bertrand C, Panayotov I, Romieu O, Levallois B. (2012) : Guidelines for Managing Endodontic Emergencies. Actual Odonto-Stomatol, (259):231-44.
- 5- Maleville M, Vergne M, Greva P, Lambert R, Dubois O. (2010) : Management and Documentation of Pain in Emergency Patients. Urgence, 99:1091-101.
- 6- Kaboré WAD. (2021): Endodontic emergencies at the YalgadoOuedraogo University Hospital Center:prevalence,epidemiological and therapeutic aspects.TurkEndodJ. Available at: <http://turkendodontidernegi.org/jvi.aspx?pdire=tej&plng=eng&un=TEJ>
- 7- Romieu G, Bertrand C, Romieu O, Levallois B.(2012)Management Guidelines for Endodontic Emergencies. Current Trends in Odontostomatology, 259:231–44.
- 8- Bane K, Léye-Benoist F, Aïdara AW, Tahiri MC, Touré B. (2013) :Attitudes of Dentists in the Dakar Region Towards Endodontic Emergencies. Rev Coll Odonto-StomatolAfrChirMaxillo-fac, 20(4):25.
9. Touré B, Azogui-Lévy S, Dzara I, Azérad JBY, Boucher Y. (2011) : Quality of endodontic treatments in a sample of patients consulting in emergencies at the dentistry department of GHPS. Reverend Odonto-Stomatol, 280-92.
10. YinglingNM, Ellen Byrne B, Hartwell GR.(2002) : Antibiotic Use by Members of the American Association of Endodontists in the Year 2000:Report of a National Survey.Journal of Endodontics, 28(5):396-404 .
- 11- Paul V.A. (2022) : Present status and future directions:Managing endodontic emergencies. IntEndod J, 55(Suppl. 3):778–803.
12. Vienne PM. (2019): Management of acute apical periodontitis in emergency situations: description of professional practices among dentists in Nouvelle-Aquitaine;34-38.
- 13- Rodriguez-NúñezA, Cisneros-Cabello R, Velasco-Ortega E, Llamas-Carreras JM, Torres-LagaresD, Segura-Egea JJ.(2009) : Antibiotic Use by Members of the Spanish Endodontic Society.Journal of Endodontics, 35(9):1198-203
- 14- MainjotA, D’HooreW, VanheusdenA, VanNieuwenhuysenJP.(2009) : Antibiotic prescribing in dental practice in Belgium.International Endodontic Journal, 42(12) :1112-7.