



## Original Research Article

## Anti-inflammatory drugs prescription in the department of endodontics, university hospital centre of cocody, Abidjan

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## ARTICLE INFO

## Article history:

Received 25-10-2020

Accepted 03-11-2020

Available online 11-11-2020

## Keywords:

Endodontics

Antiinflammatory drugs

Abidjan

## ABSTRACT

**Background:** Inflammation is the body's common defense and adjustment process from any tissue attack. Administering anti-inflammatory drug may help define inflammatory responses. In endodontics they are increasingly administered topically and/or systemically.

**Aim:** The objective of this study was to assess anti-inflammatory drug prescription patterns in endodontics at the University Hospital Center (UHC) of Cocody Abidjan.

**Materials and Methods:** A descriptive retrospective study was carried out, analyzing 100 medical records of patients who had been at the department of Endodontic between January 2015 and December 2017.

**Results:** Systemically and/or topically anti-inflammatory drugs had been prescribed in 71% of cases following initial treatment, particularly in cases of acute pulpitis (35.20%). Moreover, although the obturation apical limits were normal and regardless of the quality of the filling, these prescriptions were still given (45%), and Ibuprofen was the most prescribed anti-inflammatory (51.70%).

**Conclusion:** Prescribing anti-inflammatory drugs in endodontics is essential for defining inflammatory phenomena. However, it must be proper and controlled at the University Hospital of Cocody, Abidjan.

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### 1. Introduction

Pain management is the most challenging in dental care. In endodontics, clinical management is provided because patients may experience preoperative pulpal or periapical infections, which are usually inflammatory and can impact postoperative pain.<sup>1</sup> Still, successful endodontic treatment is the reference treatment to define the inflammation and put an end to the related-pain. According to the National College of Odonto-Conservative Teachers (NCOCT), endodontic treatment is a therapeutic process for root canals in regards to the classic endodontic triad: preparation, antiseptics and obturation. It goes from the coronary end to the apical end of a root canal of a tooth or a dental root according to the High Authority of Health (HAH). However, it is not sufficient on its own to overcome the pain. Thus, drug prescription remains the only available

option for relieving pulpal and periapical inflammation pain related.<sup>2,3</sup>

In endodontics, anti-inflammatory drugs (steroidal anti-inflammatory and non-steroidal anti-inflammatory drugs) administration can be either systemic or topical.<sup>4</sup> Topically, they are introduced into the root canal system for instant relief of acute pain. However, using them can cause allergy, sensitivity and resistance, thus, their use is relatively rare. When they are used systemically, it is for treating inflammatory inflammation and relieving inflammatory pain.<sup>5</sup> They are also prescribed for preventive purposes and their analgesic properties in cases of inferior alveolar nerve damage, resulting from either over-instrumentation of the apical nerve not respecting the working length, or by exceedence filling material.<sup>6</sup>

That is why anti-inflammatory substances can help with inflammatory responses.

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However, like any other drug, they have indications and contraindications. With that in mind, the Francophone Society of Dental Medicine and Dental Surgery had recommended that non-steroidal anti-inflammatory drugs be considered only as analgesics because they do not have known side effects and contraindications on edema.<sup>7</sup> Using anti-inflammatory drugs requires increased vigilance and a good knowledge of their mechanisms, beneficial and adverse effects and incompatibilities.

The objective of this work was to assess the practitioners' prescription patterns of anti-inflammatory drugs in endodontics at the University Hospital of Cocody, Abidjan, according to the different pulp pathologies and the obturation quality.

## 2. Materials and Methods

A descriptive retrospective study was carried out at the Department of Endodontics, University Hospital of Cocody-Abidjan, which focused on analyzing medical records of patients who had been at the Endodontics Department between January 2015 and December 2017. The National College of Dental Surgeons of Côte d'Ivoire (NCDSCI) ethics committee approved the study (NCDSCI/2014/05).

From 350 reviewed records, were selected for the study sample those that met the following inclusion criteria:

1. Records involving endodontic treatment (ET),
2. ET preceded and/or followed by anti-inflammatory prescription,
3. Records with interpretable retro-alveolar radiographs of endodontic treatment.

In all, 100 patients' medical records were selected to assess the endodontic treatment quality from radiographs and anti-inflammatory drug prescriptions. The data collected was processed with Epi-Info.Fr Version 7 and tables and graphs were produced using Microsoft Excel 2016 software.

## 3. Results

Results of the processed data are presented in form of tables:

1. Endodontic pathologies,
2. Radiographic assessment of the obturation quality,
3. Endodontic pathologies and anti-inflammatory prescriptions,
4. Root canal obturation and anti-inflammatory prescriptions.

### 3.1. Endodontic pathologies

Pulp pathologies are 71% higher, including acute pulpitis (25%), subacute pulpitis (17%), pulpo-desmodontal syndrome (22%) and chronic pulpitis (7%).

### 3.2. Radiographic assessment of the obturation quality

The correctly done obturations were higher.

Obturation with excessive extrusion of filling material in the periapex are 16%.

### 3.3. Endodontic pathologies and anti-inflammatory prescriptions

The highest number of anti-inflammatory prescriptions were for pulp pathologies, particularly in cases of acute pulpitis (35.2%), pulpo-desmodontal syndrome and subacute pulpitis, respectively 25.4% and 24%.

71% of the cases were given systemic and topical anti-inflammatory drugs after the initial treatment.

Ibuprofen<sup>®</sup> (26 cases or 36.62%) is the most widely prescribed anti-inflammatory molecule after initial treatment followed by Niflumic Acid (24 cases or 33.80%) and Diclofenac (21 cases or 29.58%).

### 3.4. Root canal fillings and anti-inflammatory prescriptions

Anti-inflammatory drugs were prescribed in 13 cases or 45%, although the apical limits of the fillings were correct (normal).

Regardless of the quality of the filling, Ibuprofen<sup>®</sup> was the most prescribed molecule (51.70%).

**Table 1:** Sample distribution by pulp pathology

Pathologies	Numbers	Percentages (%)
Acute Pulpitis	25	25
Subacute Pulpitis	17	17
Pulpo-desmodontal syndrome	22	22
Chronic Pulpitis	7	7
Acute apical periodontitis	5	5
Phoenix abscess	2	2
Chronic apical periodontitis	22	22
Total	100	100

**Table 2:** Sample distribution by obturation quality

Obturation quality	Number	Percentages
Correct	84	84
Incorrect	16	16
Total	16	16

## 4. Discussion

According to Aldous JA.et al. and Mickel AK.et al. pain treatment is an inevitable sequence of dental care.<sup>7,8</sup>

Thus, analyzing the 100 medical records has revealed, during that period, an increased frequency of acute pulpitis (25% of cases) (Table 1) than any other pulp pathology.

**Table 3:** Sample distribution according to the apical limit of obturation

Filling apical limit	Number	Percentage (%)
Obturation material at 2mm from the radiographic apex (normal)	84	84
Absence of obturation material up to a height of >2mm from the radiographic apex (underfilling)	0	0
Presence of excessive extrusion of filling material in the periapex (overfilling)	16	16
Total	100	100

**Table 4:** Anti-inflammatory drug types according to pathology after initial treatment

Pathologies	SAID		NSAID	
	Number (Nbr)	Percentage (%)	Number (Nbr)	Percentage (%)
Acute Pulpitis	0	0	25	35.2
Subacute Pulpitis	0	0	17	24
Pulpo-desmodontal syndrome	0	0%	18	25,4%
Chronic Pulpitis	0	0%	4	5,6%
Acute apical periodontitis	0	0%	5	7%
Phoenix abscess	0	0%	2	2,8%

**Table 5:** Distribution of systemic and topical anti-inflammatory drug prescriptions based on pathologies after initial treatment.

Pathologies	Product	Intersessional band-aid		NSAIDS	
		N (%)	Yes	No	
Acute Pulpitis	Ca (OH)2	5 (20%)	25	0	
	Chlorobutanol®.	20 (80%)			
Subacute Pulpitis	Ca (OH)2	2 (11, 8%)	17	0	
	Endoseptone®	4 (23, 5%)			
	Chlorobutanol®.	11 (64, 7%)			
Pulpo-desmodontal syndrome	Ca (OH)2	6 (27, 3%)	18	4	
	Chlorobutanol®.	16 (72, 7%)			
	Ca (OH)2	4 (57, 1%)			
Chronic Pulpitis	Endoseptone®	2 (28, 6%)	4	3	
	Chlorobutanol®.	1 (14, 3%)			
	Ca (OH)2	4 (80%)			
Acute apical periodontitis	Endoseptone®	1 (20%)	5	0	
Phoenix abscess	Ca (OH)2	2 (100%)	2	0	
Chronic apical periodontitis	Ca (OH)2	22 (100%)	0	22	

**Table 6:** Anti-inflammatory molecules prescriptions according to pathologies after initial treatment.

Pathologies	Molecules					
	Niflumic acid®.		Diclofenac®		Ibuprofen®	
	N	%	N	%	N	%
Acute Pulpitis	1	4.20	10	47.60	14	54
Subacute Pulpitis	2	8.30	3	14.30	12	46
Pulpo-desmodontal syndrome	17	70.80	1	4.80	0	0
Chronic Pulpitis	4	16.70	0	0	0	0
Acute apical periodontitis	0	0	5	23.80	0	0
Phoenix abscess	0	0	2	9.50	0	0
Total	24	100	21	100	26	100

**Table 7:** Anti-inflammatory drug prescription types by apical limit quality

Filling apical limit	AIS		NSAIDS	
	Number	Percentage (%)	Number	Percentage (%)
Obturation material at 2mm from the radiographic apex (normal)	0	0	13	45
Absence of obturation material over a height of >2mm from the radiographic apex (underfilling)	0	0	0	0
Presence of excessive extrusion of filling material in the periapex (overfilling)	0	0	16	55
Total	0	0	29	100

**Table 8:** Prescription of anti-inflammatory molecules according to the obturation apical limit quality

Molecules	Filling apical limit		
	Obturation material at 2mm from the radiographic apex (normal)	Presence of excessive extrusion of filling material in the periapex (overfilling)	Percentage (%)
Niflumic Acid	2	2	13,80
Ibuprofen®	4	11	51,70
Diclofenac®	7	3	34,50
Total	13	16	100

Such a trend in Côte d'Ivoire could be because pain is the main cause of going to the dentist.<sup>9</sup> It was the same scenario at the Conservative Dentistry and Endodontics Clinic in Dakar according to the findings of Kane et al., who had reported a high prevalence of acute pulpitis when assessing the drug intake and prescription patterns.<sup>10</sup>

Moreover, this study had shown that they are even higher after initial treatment, particularly in cases of acute pulpitis (35.2%) (Table 4), in contrast to the study by Kane et al. which showed an insignificant number of anti-inflammatory prescriptions after initial treatment.<sup>10</sup> However, in post-obturation, the surveyed dentists had prescribed anti-inflammatory drugs more than TBAs and analgesics and they were mostly in cases of acute pulpitis (42.7%). Indeed, anti-inflammatory drugs prescription between sessions are intended to manage pretreatment pain or prevent potential pain occurrence before the next appointment. They were prescribed after the extirpation of the pulpal parenchyma. This study showed that non-steroidal anti-inflammatory drugs (71%) were the most prescribed, in contrast to Mickel AK et al.'s which reported only 33% after initial treatment.<sup>11</sup> Among the prescribed NSAIDs, Ibuprofen® was the molecule of choice (36.62%) after initial treatment (Table 6), which Moore PA et al. said is the most common peripheral analgesic in post-emergency treatment.<sup>12</sup> Thus, Ibuprofen® appears to be better tolerated and the one with the most favorable risk/benefit balance of all the NSAIDs chosen in dentistry. It is thus prescribed as first-line.

According to G. Romieu et al., only an accurate diagnosis along with an emergency procedure, whether or not associated with a prescription, can determine initial treatment effectiveness.<sup>13</sup> They believe that emergency

treatments should only be implemented if there is no contraindication on the overall, otherwise they are withheld or referred.

However, this study's findings show that anti-inflammatory drugs were administered very often (71%) both systemically and topically (Table 4) even after the initial treatment. Ideally, anti-inflammatory drugs should be prescribed either topically or systemically after initial treatment. This shows how anti-inflammatory prescriptions were misused in 71% of the cases.

Whatever the diagnosis, endodontic treatment was chosen. Post-obturation X-ray analysis shows that 84% of the fillings were correct versus only 16% characterized by excessive extrusion of filling material in the periapex. In this study, anti-inflammatory drugs were prescribed in 13 cases (45%) although the apical limits of the fillings were normal (Tables 7 and 8). Masson E et al.<sup>14</sup> "on the evaluation of endodontic therapeutics" had the same finding showing 16.6% of fillings with excessive extrusion of filling material in the periapex. Such foraminal crossing is inevitable because the canal is to be cleaned and sealed up to the foramen. However, it should be noted that the assessment criteria of the quality of the fillings vary according to the studies. For example, Barrieshi-Nusair KM. et al. believe in considering the length of the fillings to assess their quality, while Matysiak M. et al. considered not only the length but also the density of the root canal filling.<sup>15,16</sup> As for Unal GC. et al, the apical limit of the filling at  $\leq 2$  mm from the radiographic apex was considered as the standard for assessment and others have even added the conicity.<sup>17</sup>

In any case, incomplete obturation can hinder over 20% of a treatment success rate (L. Tronstad) and it thus

appears as the factor having the most negative impact on the prognosis.<sup>18</sup> Indeed, endodontic sealing is supposed to contend fluids percolation but also endodontic-periodontal bacterial percolation. Although it is impossible to determine by radiograph the true degree of sealing of a completely sealed canal, parameters indicating insufficient or absent sealing are nevertheless very visible: presence or absence of a radio-opaque filling, lack of standardization of the sealing, presence or absence of radiolucency bordering the filling.<sup>14</sup> Thus, to overcome these endodontic treatment limitations and requirements, prescribing anti-inflammatory drugs is necessary. According to Descroix V., NSAIDs are the common endodontics post-operative prescription in the case of excessive extrusion of filling material in the periapex, by this study results (16 cases recorded), (Table 7).<sup>19</sup> Ibuprofen® was the most prescribed molecule after root canal filling (Table 8) because it blocks both the cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) enzymes. Furthermore, it is safe and cost-effective with a very effective analgesic and anti-inflammatory action for post-endodontic pain treatment.<sup>20</sup>

## 5. Conclusion

In Côte d'Ivoire, pain is the main reason for consulting the endodontic service.<sup>9</sup>

Patient management is often preceded and/or followed by anti-inflammatory drugs prescription for relief. Prescribing anti-inflammatory drugs is common, rightly or wrongly, even after an adequate root canal treatment. However, there is still a significant gap between the level of knowledge and their clinical application possibilities. This, sometimes, leads to erroneous, insufficient, or even imprecise prescriptions, or the risk of adverse effects outweighs the benefit to the patient.

In any case, the choice of an anti-inflammatory should take into account not only the diagnosis made but also and above all the desired effect. This requires a proper and controlled approach from the practitioner to anticipate the risks of harmful side effects to the patient.

## 6. Source of Funding

No financial support was received for the work within this manuscript.

## 7. Conflict of Interest

The authors declare they have no conflict of interest.

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**Cite this article:** Adou AJ, N'Dré J, Mobio GS, Sika WGS.  
Anti-inflammatory drugs prescription in the department of endodontics,  
university hospital centre of cocody, Abidjan. *IP Indian J Conserv  
Endod* 2020;5(4):181-186.