



Flare-up Incidence and Related Factors in Nigerian Adults

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ABSTRACT

Aim: To determine the incidence of flare-up and the effect of age, gender, visit type, treatment duration, preoperative pain and intraoperative pain on flare-up in Nigerian adults.

Materials and methods: A total of 175 participants, aged 18 to 60 years with a necrotic central incisor, with or without preoperative pain, participated. They received postoperative paracetamol tablets and were asked to report back if unbearable pain/swelling developed.

Results: A 10% flare-up rate was recorded, while none of the studied factors had a significant relationship with flare-up.

Conclusion: The relationships between flare-up and studied related factors were not proven.

Clinical significance: Age, gender, visit type, treatment duration, preoperative pain and intraoperative pain have no effect on flare-up incidence.

Keywords: Flare-up, Longitudinal study, Preoperative pain, Treatment duration, Visit type.

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INTRODUCTION

Many definitions of flare-up exist in the literature; each appears to be influenced by case definitions. For the purposes of this study and for it is to be more clinically useful, a flare-up was defined as pain and/or swelling which occurs between 7 a few hours and seven days, after initiation or continuation of root canal therapy (RCT), which cannot be relieved by paracetamol and for which the patient reports to the clinic for active treatment. The primary aim of RCT is to biomechanically prepare the canal with minimal or no discomfort and to hermetically seal it to aid recovery of insulted periapical tissues and to prevent postoperative pain (flare-up).¹

Depending on the study design, flare-up incidence rate ranges from 1.58 to 90%.^{2,3} Iqbal et al⁴ are of the view that

in the absence of any gold standard and because of the variable definitions, comparison of flare-up incidence across studies is challenging. Pickenpaugh et al⁵ reported age and gender, use of antibiotics and analgesics, pulpal status, preoperative pain as well as periapical radiolucency as flare-up factors.

RCT can be a one- or two-visit procedure.⁶ Though the attempt to complete RCT in one visit had been in practice since late 19th century, one vs. multiple-visit RCT remains a subject of debate among dentists.⁷ Some patients regard the latter type of RCT as a safer procedure.¹ Oliet⁸ found no significant difference between the results of two-visit methods, a finding shared by Al Bashaireh and AL Negrish¹⁰ and Eleazer and Eleazer.¹¹ On the contrary, Oginni and Udoye⁹ reported a significantly higher flare-up incidence in one-visit over multiple-visit RCT. The patients in Al Negrish and Hababbeh's¹² sample presented with no reports of preoperative pain.

O'Keefe¹³ found that a relationship between preoperative and postoperative pain levels exists. This finding was also reflected in Genet et al¹⁴ who reported 65% of patients who had preoperative pain suffered postoperative pain. Just 23% of those with preoperative pain were documented as being free from flare-up after RCT, the effect of gender was not investigated by Genet et al.¹⁴ However, Jariwale¹⁵ found that females experienced more pain and flare-ups than males.

A review of the literature was unable to find studies that highlighted the effects of age, treatment duration and intraoperative pain on flare-up incidence. It is believed that properly identified flare-ups risk factors will facilitate better patient management and improved outcome. The purpose of this study was to determine the incidence of flare-up in the adult subjects attending private endodontic clinics and to investigate the effect of age and gender, treatment duration, preoperative pain, visit type and intraoperative pain on flare-up.

MATERIALS AND METHODS

One hundred and seventy-five consecutively recruited adults, aged 18 to 60 years who attended private endodontic clinics participated in the study that lasted four months. Consenters presenting with a symptomatic or asymptomatic necrotic upper central incisor with no radiographic periapical pathology were recruited in the study. Other inclusion criteria were negative test to electric pulp test (EPT) and lack of bleeding from the pulp chamber when opened.

On the contrary, teeth that were either tender to percussion (TTP) or massively calcified intracranally were excluded in the study. Others were immature teeth or any other form of morphological abnormalities. Also, subjects on either analgesics in the last 24 hours or on antibiotics in the last one month were excluded from the study. Teeth tender to percussion were excluded to ensure that only frank necrotic teeth (inclusive criteria above referred) were studied, as tenderness to percussion, besides being of inflammatory origin, can result from other pathologies in the periapex neighborhood.

Subjects were randomly assigned to either one-visit or two-visit group. The age and gender of subjects, visit type (one or two-visit), preoperative pain status (present or absent), treatment duration (in minutes) and intraoperative pain (present or absent) were recorded on the data sheet.

Following a standard protocol, the subjects were prepared in the usual way. A step-back technique was used to prepare the canal and the working length was determined with a periapical radiograph (paralleling method), which was 1.0 mm short of the radiographic apex. A 2.5% sodium hypochlorite solution was used as irrigant, followed by normal saline after each instrumentation.

The canals in both visit groups were filled with gutta-percha using lateral condensation method, with AH26 as the sealer (Dentsply, Konstanz, Germany). However, for the two-visit cases, nonsetting calcium hydroxide (intracranally) was used as an interappointment dressing. This was retained intracranally for 7 days. Fifteen subjects were disqualified from the final filling in the two-visit group for the following reasons: Failure to produce clean dentine shavings during intracanal instrumentation, uncomfortable teeth, weeping canal or persistently wet canal. Others were dentoalveolar swelling related to the tooth and patient loss.

For the purposes of this study, treatment duration for the one-visit group was measured from the time the pulp chamber was opened to when the access cavity was sealed. On the contrary, the treatment duration for the two-visit group was the sum (in minutes) of the following: The time taken to open the pulp chamber to when access cavity was temporarily sealed during first visit, and the time taken to

remove the access filling to when the final restoration of the access cavity was placed at the second visit appointment.

Subjects were asked to take a postoperative prescription of 1000 mg of paracetamol tablets when necessary. The subjects were instructed to return to the clinic for active treatment if they experienced unbearable pain and/or swelling.

The data was analyzed with SPSS for Windows, version 6. Chi-square test (χ^2) was used to assess for independence of categorical variables. The critical significance was set at $p < 0.05$, while the confidence interval was 95%.

RESULTS

After disqualification of 15 subjects, 160 subjects (96 or 60% females and 64 or 40% males) whose ages ranged from 18 to 60 years were studied. Their mean age was 29.58 ± 10.12 and the treatment duration ranged from 35 to 98 minutes, while the mean treatment duration was 60 ± 18.67 minutes.

The incidence of flare-up in the population was 16 (10%). The two-visit RCT group flared-up more often than the one-visit RCT group, though the difference was not statistically significant ($p = 0.792$). Similarly, flare-up occurred most often in subjects with preoperative pain ($p = 0.268$). Teeth flared-up most often in the 18 to 20 years age band while in the 51 to 60 years age band, no teeth flared-up ($p = 0.279$) (Table 1).

There was no statistically significant difference in the occurrence of flare-up in the teeth with or without intraoperative pain ($p = 0.752$). Similarly, teeth flared-up more often in females than in males, though the difference was not significant ($p = 0.747$), while the mean treatment duration between cases that flared-up and those that did not was not statistically significant ($p = 0.979$) (Table 2).

DISCUSSION

All researches are limited in one way or another and the present one is by no means an exception. As a cross-sectional study, the study lacks the ability to establish temporal relationships. Furthermore, as noted by Bromm,¹⁶ pre- and postoperative pains are inherently subjective and therefore unquantifiable. Their diagnosis is based on the subject's report.

The importance of the study of flare-up incidence lies in its use as a benchmark against which the operator's skill can be measured. This is the reason why RCT with lower or no flare-up should be the treatment of choice. The current study's report of 10% flare-up incidence compares favorably with those of the Alacam et al¹⁷ and Pickenpaugh et al⁵ but not with those of Abbott et al¹⁸ and Houck et al.² Alacam et

Table 1: Flare-up by visit type, preoperative pain and age

Flare-up	Visit type		Preoperative pain		Age (years)				
	One-visit	Two-visit	Absent	Present	18-20	21-30	31-40	41-50	51-60
Absent	68	76	75	69	36	52	33	16	7
Present	7	9	6	10	6	4	2	4	0
p-value	$\chi^2 = 0.07$ p = 0.792		$\chi^2 = 1.23$ p = 0.268		$\chi^2 = 5.08$ p = 0.279				

Table 2: Flare-up by intraoperative pain, mean treatment duration and gender

Flare-up	Intraoperative pain		Mean treatment duration (in minutes)	Gender	
	Pain	No pain		Female	Male
Absent	69	75	58 ± 16.752	87	57
Present	7	9	61 ± 17.324	9	7
p-value	$\chi^2 = 0.10$ p = 0.752		$\chi^2 = 0.001$ p = 0.979	$\chi^2 = 0.10$ p = 0.747	

al¹⁷ studied flare-ups in teeth with both vital and necrotic pulp, while Pickenpaugh's sample consisted of asymptomatic necrotic teeth with periapical radiolucency. Contrastingly, 90% of the subjects, whose teeth were symptomatic and necrotic with apical radiolucency, in Houck et al's study experienced significant pain. It is noteworthy that preoperative pain was present in all these studies, which authors¹⁹ agree, is a prognostic factor and a predictor of flare-up. However, it is difficult to compare flare-up incident rates across studies as flare-up diagnosis varies across studies, because both sample populations and case definitions differ.

Existing literature on one-visit and two-visit RCT gives conflicting opinions and recommendations. Though statistically insignificant, the occurrence of more flare-ups in the two-visit RCT than in one-visit RCT in the present study agrees with the reports of Eleazer and Eleazer¹¹ and Albashireh and Al Negrish¹⁰ but not with those of Oginni, Udoye⁹ and Peters.²⁰ On the contrary, Oliet⁸ found no significant difference in postoperative pain when is comparing one-visit vs multiple-visit RCT procedures. Oliet's finding eight conforms with other reports^{21,22} that the prerequisites for a better outcome are proper diagnosis, good case selection and skilled treatment.

The present study is similar to that of O'keefe¹³ where teeth with preoperative pain flared-up more often than those with no preoperative pain. Furthermore, Genet et al¹⁴ found that 65% of patients with preoperative pain had postoperative pain, while only 23% of those with no preoperative had postoperative pain. Torabinejad et al¹⁹ stated that the preoperative pain is a prognostic flare-up factor, and its importance lies in the fact that its persistence postoperatively may be a sign of an improving condition if the severity is reduced.

Though insignificant statistically, the presence of more flare-up in the 18 to 20 years age band may be due to the fact that most subjects with preoperative pain might have been captured in this age band. Alternatively, it may be that the physiological and anatomical make-up in this age band are in sympathy with development of flare-up.

The difference between the presence of intraoperative pain and development of flare-up was not statistically significant in the present study, yet the relationship remains uninvestigated in the dental literature. The possible causes of intraoperative pain are overinstrumentation and injury to periapical tissues, preexisting irreversible pulpitis, periapical periodontitis as well as failed local anesthesia. Most of these factors are known flare-up predictors. Though both age and gender are not statistically significant flare-up risk factor in the present study, the findings of more flare-ups in females than in males agree with the report of Jariwale.¹⁵ The reason may be constitutional or physiological. Furthermore, Liddell and Locker²³ reported an actual reduction of pain thresholds in women.

CONCLUSION

The relationships between flare-up and studied related factors were not proven.

CLINICAL SIGNIFICANCE

Age, gender, visit type, treatment duration, preoperative pain and intraoperative pain have no effect on flare-up incidence.

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REFERENCES

1. Grossman LI, Oliet S, Del Rio C. Endodontic practice (11th ed). Philadelphia: Lea and Febiger 1988.
2. Houck V, Reader A, Beck M, Nist R, Weaver J. Effect of trephination on postoperative pain and swelling in symptomatic necrotic teeth. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000;90:507-13.
3. Imura N, Zuolo ML. Factors associated with endodontic flare-up: A prospective study. *Int Endod J* 1995;28:261-65.
4. Iqbal M, Kurtz E, Kohli M. Incidence and factors related to flare-ups in a graduate endodontic program. *Int Endod J* 2009;42:94-104.
5. Pickenpaugh I, Reeder A, Beck M, Meyers WJ, Peterson D. Effect of prophylactic amoxicillin on endodontic flare-up in asymptomatic necrotic teeth. *J Endod* 2001;27:53-56.
6. Sathorn C, Parashos P, Messer H. The prevalence of postoperative pain and flare-up in single and multivisit endodontic treatment: A systematic review. *Int Endod J* 2008;41:91-99.
7. Bergenhaltz G, Spangberg L. Controversies in endodontics. *Cit Rev Oral Biol Med* 2004;15:99-114.
8. Oliet S. Single visit endodontics: A clinical study. *J Endod* 1983;9:147-52.
9. Oginni A, Udoye C. Endodontic flare-up: Comparison of incidence between single and multivisit procedures in patients attending a Nigerian Teaching Hospital BMC Oral Health 2004;4:4-6.
10. Al Bashaireh ZSM, AL Negrish AS. Postobturation pain after single endodontic therapy: A prospective study. *J Dent* 1988;26:227-32.
11. Eleazer PD, Eleazer KR. Flare-up rate in pulpally necrotic molars in one-visit versus two-visit endodontic treatment. *J Endod* 1998;24:614-16.
12. Al Negrish AR, Hababbeh R. Flare-up rate related to root canal treatment of asymptomatic pulpally necrotic central incisor teeth in patients attending a military hospital. *J Dent* 2006;34:635-40.
13. O'Keefe EM. Pain in endodontic therapy: Preliminary study. *J Endod* 1976;2:315-19.
14. Genet JM, Wesselink PR, Thoden Van Velzen SK. Preoperative and operative factors associated with pain after the first endodontic visit. *Int Endod J* 1987;20:53-64.
15. Jariswala SP, Goel BR. Pain in endodontics: Causes, prevention and management. *Endodontol* 2001;13:63-66.
16. Bromm B. Pain measurement in man: Neurophysiological correlates of pain. Amsterdam: Elsevier 1984.
17. Alacam T. Incidence of postoperative pain following the use of different sealers in immediate root canal filling. *J Endod* 1985;11:135-37.
18. Abbott AA, Koren LZ, More DR, Sinai LH, Doo RS, Furst ML. Prospective randomized trial on efficacy of antibiotic prophylaxis in asymptomatic teeth with pulpal necrosis and associated periapical pathosis. *Oral Surg Oral Med Oral Pathol* 1988;66:722-33.
19. Torabinejad M, Cymerman JJ, Frankson M, Lemon RR, Maggio JD, Schilder H. Effectiveness of various medications on postoperative pain following complete instrumentation. *J Endod* 1994;20:345-54.
20. Peters DD. Evaluation of prophylactic alveolar trephination to avoid pain. *J Endod* 1980;6:518-26.
21. Fava LR. A comparison of one visit versus two appointment endodontic therapy in teeth with nonvital pulps. *Int Endod J* 1991;22:179-83.
22. Soltanoff WA. Comparative study of single visit and the multiple endodontic procedures. *J Endod* 1978;4:278-81.
23. Liddell A, Locker D. Gender and age differences in attitudes to dental pain and dental control. *Com Dent Oral Epidemiol* 1997;25:315.

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