

Alveolar Osteitis: Patients' compliance to post-extraction instructions following extraction of molar teeth

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ABSTRACT

Background: To evaluate the effect of various combination of post-extraction regimen administered to patients who had intra-alveolar molar tooth extraction. **Patients and Methods:** One year prospective study involving 76 consenting patients who came for 1-week post-extraction review. The patients were placed on warm saline mouth rinse with (verbal instruction) or without antibiotic and or analgesic therapy (written prescription), after intra-alveolar molar tooth extraction. Information was obtained from the patients through questionnaire and clinical examination. **Results:** The patients were placed on warm saline mouth rinse ($n = 29$, 38.2%) only, warm saline rinse, antibiotics (Amoxicillin and metronidazole) and Paracetamol ($n = 31$, 40.8%), Paracetamol and warm saline rinse ($n = 12$, 15.8%) and antibiotics (Amoxicillin and metronidazole) and Paracetamol ($n = 4$, 5.3%). A total of 63 (82.9%) patients complied with the post-extraction regimen, giving a significant high compliance to the post-extraction instructions ($P = 0.001$). There were 10 (13.2%) cases of post-extraction localised alveolar osteitis, with predilection for the lower molar teeth ($n = 6$, 7.9%) and a significant predilection for females ($n = 8$, 10.5%) [$P = 0.005$]. Overall, there were five (6.6%) cases each of localised alveolar osteitis in the compliant patients ($n = 63$, 82.9%) and non-compliant patients ($n = 13$, 17.1%), giving a ratio of 1:13 and 1:3, respectively. There was significant association of compliance with post-extraction instruction and the reduced incidence of localized alveolar osteitis ($P = 0.015$). **Conclusion:** This study showed a significant patients' compliance with post-extraction warm saline rinse, prophylactic antibiotics and analgesic and a corresponding significant reduction in the incidence of localised alveolar osteitis following intra-alveolar molar tooth extraction. This study emphasises the need to properly educate patients on the effect of compliance to various combination of post-extraction regimen.

Key words: Alveolar osteitis, molar tooth extraction, post-extraction regimen

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INTRODUCTION

Dry socket or localised alveolar osteitis is the most common complication of tooth extraction, with associated pain due to inflammatory changes in the exposed socket wall following breakdown of blood clot in extraction socket.¹ The incidence of dry socket ranges from 0.6% to 5.6% in intra-alveolar extraction and 24.7% in trans-alveolar extraction.²⁻⁴ Previous studies show predilection of females, mandibular teeth, patients in the 3rd decade of life and smokers for alveolar osteitis.^{2,4} A reduced incidence of

alveolar osteitis was reported in patients with good oral hygiene, avoidance of iatrogenic trauma to teeth and avoidance of surgery in days 1 and 22 of the menstrual cycle in non-menopausal females.⁵

Recent report showed significantly better compliance among patients placed on verbal instruction than those placed on written instruction on the use of warm saline mouthwash after oral surgical procedures.⁶ However, the use of verbal and written post-surgical instruction was reported to enhance compliance.⁶ Some studies on the use of post-extraction mouthwash (warm saline, hydrogen peroxide, chlorhexidine) and antibiotics (tetracycline, amoxicillin /clavulanic acid, clindamycin, metronidazole) have reported reduction in the incidence of post-extraction alveolar osteitis.^{1,6-10}

There are previous Nigerian reports that focussed mainly on incidence and pattern of alveolar osteitis,^{4,11} and the risk factors influencing the development alveolar

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osteitis following tooth extraction.^{3,5} Apart from Adebayo and Dairo⁶ report on compliance to warm saline mouth wash after oral surgical procedure, no other study to our knowledge has evaluated compliance to various post-extraction regimen with the incidence of alveolar osteitis in our environment. This study aims to evaluate the effect of various combination of post-extraction regimen administered to patients who had intra-alveolar molar tooth extraction.

PATIENTS AND METHODS

This is a prospective study performed within a year (June 2001–May 2002) involving patients who were placed on warm saline mouth rinse six to eight times daily for 1 week (verbal instruction) alone, warm saline mouth rinse with or without antibiotic (Amoxicillin 500 mg and metronidazole 400 mg 8 hourly for 5 days) and or analgesic (Paracetamol 1000 mg 8 hourly for 5 days) therapy (written prescription), or the antibiotic and analgesic therapy alone, after intra-alveolar molar tooth extraction in the Department of Oral and Maxillofacial Surgery and Oral Pathology, Obafemi Awolowo University Teaching Hospital, Ile-Ife (for the patients on warm saline mouth rinse alone, because this Centre usually prescribes this post-extraction regimen); and Department of Oral and Maxillofacial Surgery and Pathology, University of Benin Teaching Hospital, Benin City, Nigeria (for patients on warm saline mouth rinse with or without antibiotics and patients on antibiotics and analgesic, because this Centre usually prescribes these post-extraction regimen).

Consenting patients who had intra-alveolar molar tooth extraction and were placed on various post-extraction regimen based on the chosen hospital centres, and those who came for 1-week post-extraction review were selected for this study. The patients with history of smoking, frequent intake of alcohol, those suffering from diabetes mellitus, those on oral contraceptive and poor oral hygiene were excluded from this study. The study was carefully explained to the patients and they were assured of strict confidentiality of information obtained through questionnaire and clinical examination. Ethical approval was obtained from the Hospital Ethical Committees of the two hospitals.

The patients' age, gender, site of the molar tooth, post-extraction regimen and alveolar osteitis were analysed. Pearson's chi square correlation was performed for the variables, with confidence level set at 95% and *P* value of < 0.05 was considered significant.

RESULTS

Of the 76 patients studied there were 49 (64.5%) females and 27 (35.5%) males, giving a male to female ratio of 1:1.8.

The peak age group of the patients was the 3rd decade of life (*n* = 29, 38.2%), with a mean age of 35 ± 20 years [Table 1]. Forty-two (55.2%) of the patients had lower molar tooth extraction, 22 (29.0%) patients had upper molar tooth extraction, while 12 (15.8%) patients had upper molar and lower molar extraction.

A total of 63 (82.9%) patients complied with the post-extraction regimen, giving a significantly high compliance to the post-extraction instructions (*P* = 0.001). Twenty-two (29.0%) patients were compliant among the 29 (38.2%) cases placed on warm saline mouth rinse. Of the 31 (40.8%) patients placed on warm saline mouth rinse, antibiotics (Amoxicillin and metronidazole) and analgesic (Paracetamol), 27 (35.5%) cases were compliant. Twelve (15.8%) patients were on analgesic and warm saline rinse, among which 11 (14.5%) cases were compliant. Of the 4 (14.5%) patients placed on antibiotics (Amoxicillin and metronidazole) and Paracetamol, three (4.0%) cases were compliant.

There were 10 (13.2%) cases of post-extraction localised alveolar osteitis, with predilection for the lower molar teeth (*n* = 6, 7.9%), followed by upper molar teeth (*n* = 3, 4.0%) and one (1.3%) case involving both upper and lower molar teeth. There was a significant female predilection for alveolar osteitis (*n* = 8, 10.5%) (*P* = 0.005) in this study [Table 2]. There were five (6.6%) cases of localised alveolar osteitis in the compliant patients (*n* = 63, 29.0%) giving a ratio of 1:12.6. Five (6.6%) cases of localised alveolar osteitis were found among non-compliant patients (*n* = 13, 17.1%), giving a ratio of 1:2.6. There were two (2.6%) cases each of localised alveolar osteitis in compliant patients (*n* = 22, 29.0%, ratio 1:11) and non-compliant patients (*n* = 7, 9.2%, ratio 1:3.5) on warm saline mouth rinse only. Among the patients placed on warm saline mouth rinse, antibiotics and analgesic, there were three (4.0%) cases of alveolar osteitis in compliant (*n* = 27, 35.5%, ratio 1:9) and one (1.3%) case of alveolar osteitis in non-compliant patients (*n* = 4, 5.3%, ratio 1:4). Among the patients placed on analgesic and warm saline mouth rinse, there was one (1.3%) case of alveolar osteitis in the non-compliant patient (ratio

Table 1: Age distribution of the patients placed on post-extraction regimen

Age group	Frequency	%
10-19	10	11.8
20-29	34	44.7
30-39	7	9.2
40-49	7	9.2
50-59	11	14.5
60-69	2	2.6
70-79	3	4.0
> 80	3	4.0
Total	76	100

Table 2: Age, gender and tooth type distribution of localised alveolar osteitis in the patients placed on post-extraction regimen

Age group	Frequency (%)	Gender	Frequency (%)	Tooth-type	Frequency (%)	PER	Frequency (%)	Compliant	Non compliant
10-19	1 (1.3)	Male	2 (2.6)	Upper molar	3 (4.0)	S	2	2	4 (5.3)
20-29	4 (5.3)	Female	8 (10.5)	Lower molar	6 (7.9)	SAA	3	1	4 (5.3)
30-39	1 (1.3)			UM and LM	1 (1.3)	SA	—	1	1 (1.3)
40-49	3 (4.0)					AA	—	1	1 (1.3)
50-59	1 (1.3)								
Total	10 (13.2)		10 (13.2)		10 (13.2)		5 (6.6)	5 (6.6)	10 (13.2)

PER – Post-extraction regimen; S – Saline only; SAA – Saline antibiotics and analgesic; SA – Saline and analgesic; AA – Antibiotics and analgesic; UM – Upper molar; LM – Lower molar

of 1:1). Among the patients placed on analgesic and antibiotics, there was one (1.3%) case of alveolar osteitis in the non-compliant patient ($n = 1$, 1.3%, ratio of 1:1). There was significant association of non-compliance with post-extraction regimen and the incidence of localised alveolar osteitis ($P = 0.015$) [Table 2].

DISCUSSION

Although compliance to post-extraction regimen using mouth rinses and prophylactic antibiotics are reported to significantly reduce the incidence of localised alveolar osteitis,^{1,6-10} dental surgeons often administered post-extraction regimen without considering patients' preference for any combination of the regimen based on predictable outcome of the regimen.

This study showed significant compliance to the post-extraction regimen, which agrees with previous report by Adebayo and Dairo.⁶ A corresponding significant reduction in the incidence of localised alveolar osteitis was also observed among the compliant patients in this study following molar teeth extraction. Conversely, a relatively higher incidence of localised alveolar osteitis was found among patients who were non-compliant with the post-extraction regimen. Overall, a relatively higher incidence of localised alveolar osteitis was observed in this study, with significant predilection of the lesion for females and mandibular molar teeth. Similarly, female predilection for dry socket has been previously reported in Nigeria^{11,12} and United Kingdom.¹³ Furthermore, female and mandibular molar teeth predilection for dry socket was also reported by Oginni.⁵ However, equal incidence of dry socket in the maxilla and mandible, occurring exclusively in molar and premolar teeth was reported by Ogunlewe *et al.*,¹¹ The higher incidence of localised alveolar osteitis in this study, may be due to the selection of patients who had molar tooth extraction, a group known to be highly susceptible to alveolar osteitis.^{2,3,11,13}

Although the mechanism of action of the post-extraction regimen in the prevention of dry socket is not very clear, previous report by Cardoso *et al.*,¹⁴ states that

irrigation of extraction socket with increasing amount of physiologic saline progressively decreases the incidence of dry socket,^{15,16} while antibiotics prevent dry socket because of the antimicrobial effect against bacteria involved in pathogenesis of dry socket.¹⁷ When the use of various combination of the post-extraction regimen were compared with the incidence of developing alveolar osteitis in this study, compliance to post-extraction warm saline mouth rinse alone, as prescribed in the Ile-Ife Centre was the most effective in the prevention of localised alveolar osteitis. This was followed by compliance to a combination of warm saline mouth rinse, antibiotic and analgesic as prescribed in the Benin Centre. This finding indicated that the warm saline mouth rinse alone has advantage of better compliance and consequently, it was more effective in reducing alveolar osteitis compared with the combination post-extraction regimen. But there was a higher risk of patients placed on warm saline mouth alone and warm saline mouth and analgesic without antibiotics developing alveolar osteitis. However, localised alveolar osteitis was observed mostly in non-compliant patients placed on warm saline mouth rinse and analgesic and patients placed on antibiotics and analgesic.

There was reduced number of patients in this study because some of the consenting patients did not present in clinic for the 1-week post-extraction review. Also, this study was not specifically focussed on patients' preference for various combination of the post-extraction regimen. However, the findings of this study from the two Centres, suggest that it may be needful to properly educate patients on the effect of compliance to various combination of post-extraction regimen in reducing the incidence of localised alveolar osteitis. Thereafter, the patients' preferred regimen is identified and accordingly prescribed to the patients after tooth extraction. Furthermore, large randomised controlled studies is recommended to determine the rationale for individualising post-extraction regimen to each patient and to assess the effectiveness of each regimen, while taking into account the other known factors that could contribute to the effectiveness of the regimen.

CONCLUSION

This study showed a significant patients' compliance with post-extraction warm saline mouth rinse, prophylactic antibiotics and analgesic and a corresponding significant reduction in the incidence of localised alveolar osteitis following intra-alveolar molar tooth extraction. A relatively higher incidence of localised alveolar osteitis was observed in this study, with significant predilection of the lesion for females, mandibular molar teeth and non-compliance to post-extraction regimen. Compliance to post-extraction warm saline mouth rinse, followed by compliance to a combination of warm saline mouth rinse, antibiotic and analgesic, may be the most effective measures of reducing the incidence of localised alveolar osteitis. This study emphasises the need to properly educate patients on the effect of compliance to various combination of post-extraction regimen in reducing the incidence of localised alveolar osteitis.

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