ROLE OF ANTIBIOTICS IN CONTROL OF POST-ENDODONTIC PAIN: CASES OF SYMPTOMATIC IRREVERSIBLE PULPITIS AND PERIAPICAL PERIODONTITIS: A RANDOMIZED CONTROL CLINICAL TRIAL

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ABSTRACT

Objective: To determine the role of antibiotics in post endodontic pain in cases of acute irreversible pulpitis and acute periapical periodontitis.

Material and Methods: This was a randomized controlled clinical trial of 90 subjects with symptomatic irreversible pulpitis and periapical periodontitis. This study was carried out at the department of Operative Dentistry, Khyber College of Dentistry, Peshawar, from August 2011 to December 2011. The subjects were divided into two groups, placebo and antibiotic group with 45 subjects in each group. Data was collected on the pain experienced using the visual analog scale (VAS) at 12, 24, 48 and 72 hours intervals respectively.

Results: Ninety subjects were included in this study with age range 10-63 years. Among these 52.2% were females and 47.8% were males. Postoperative pain was 64.4% and 66.7% in placebo and antibiotic group respectively in the first 12 hours and markedly reduced in the following 72 hours. Females were found to have experienced more pain in the first 12 hours than males (P<0.05). Statistically no significant difference in occurrence of pain was found between various age groups (p>0.05).

Conclusion: This study concluded that antibiotics have no significant role in the control of post endodontic pain.

Key Words: Postoperative pain, Antibiotics, Irreversible pulpitis, Periapical periodontitis.

INTRODUCTION

Pain is a frequent complication associated with endodontic treatment and it has a great impact on the quality of life. Post operative pain after endodontic procedures is an undesirable occurrence for patients as well as clinicians. Causes of post-operative pain include mechanical, chemical and microbial injuries to the pulpal or peri-radicular tissues. Microbial injury is probably the major and most common cause of postoperative pain and some gram negative anaerobic micro-organism may play an important role in the development of symptoms.

Many endodontically involved teeth that are treated with antibiotics are not infected and even if they are infected, antibiotics do no good as they cannot reach to the site due to paucity of circulation. Antibiotics are not an alternative to dental intervention but they are used as an adjunct to it. However, antibiotics are appropriate in some patients with acute dentoalveolar infections, such as cellulites or a spreading infection. Indiscriminate use of antibiotics can give rise to drug resistance which is one of the most significant and emerging problem of the present time. We have now entered an era in which some bacterial species, including those involved in endodontic infections,
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are resistant to full range of antibiotics presently available8.

Endodontic is one of the discipline of dentistry where antibiotics are used extensively either for therapeutic or prophylactic purposes9. A definitive indication of antibiotics in endodontics is controversial because there is paucity of scientific evidences to support the use of antibiotics in clinical practice9,10,11. Some studies give conclusive evidence of therapeutic benefit, while others indicate that antibiotics are not beneficial12.

The primary aim of the present study was to investigate whether antibiotics could be of any help to relieve post-endodontic pain in patients with symptomatic irreversible pulpitis or periapical periodontitis.

SUBJECTS AND METHOD

In this randomized controlled clinical trial, a sample size of 90 subjects was used. The study was approved by the ethical committee of Khyber College of Dentistry. The subjects were randomly placed either in group 1 (placebo group) or group 2 (Antibiotic group). Patients were divided into three age groups i.e. 10-27 years, 28-45 years and 46-63 years. Cooperative and healthy subjects of both sexes who presented at the Department of Operative Dentistry, Khyber College of Dentistry, Peshawar, between August 2011 and December 2011 with a diagnosis of acute irreversible pulpitis and acute periapical periodontitis were included in this study. Patients with a sinus tract, periapical abscess, pulp necrosis, chronic periapical periodontitis, and patients already on antibiotics were excluded. Periapical radiographs were taken and thoroughly studied to exclude teeth with any periapical lesions.

A thorough root canal cleaning and shaping was done using step-down technique. Sodium hypochlorite (2.25%) was used as an irrigation solution and calcium hydroxide as an intra-canal medicament. A size 10 K-file was used for patency of the apical foramen. The patients were guided to record the intensity of pain postoperatively at 12, 24, 48 and 72 hours interval on short ordinal numerical pain visual analogue scale (VAS) graded from 0 to 3: zero (0) indicating no pain, one (1) mild pain, two (2) moderate pain, and three (3) severe pain. The patients in group 1 were given a placebo for three days while patients in group 2 were medicated with antibiotic (Co-Amoxiclave 1G, b.d) for the same period of time. Nimusulide (100 mg, b.d) was given as an analgesic in both groups for three days. The patients were recalled after three days and the proforma was collected. The data was analyzed using SPSS version 17. Chi-Square test was applied for variables i.e. gender, age, occurrence of pain and use of antibiotic or placebo. The level of statistical significance was set at p < .05.

RESULTS

Ninety subjects were included in this study. Age range was from 10 to 63 years with mean age 34.16 ± 12.82 years. Out of 90 subjects, 52.2% were females and 47.8% were males. Forty five subjects were assigned to placebo group, 37.8% with acute irreversible pulpitis and 12.2% with acute periapical periodontitis. Similarly 45 subjects were placed in antibiotic group, 35.6% with acute irreversible pulpitis and 14.4% in acute periapical periodontitis. Male and female distribution of the initial diagnosis showed, that 67.5% of males had acute periapical periodontitis while 32.5% had acute irreversible pulpitis. In females these figures were 21.2% and 78.8% respectively. All subjects presented with preoperative pain of certain degree.

Figure 1 shows that in the first 12 hours, pain was reported in 64.4% and 66.7% of the subjects in group 1 and 2 respectively. However, at 72 hours, the occurrence of pain was reduced to 11.1% in group 1 and 15.6% in group 2 with statistically no significant difference between the two groups. The occurrence of pain in the first 12 hours was significantly higher in females (P < .021) than males as shown in Figure 2.

In the age group of 10-27 years post endodontic pain remained for 24 hours as compared to the other two age groups, where pain was high in the first 12 hours but significantly reduced at 24 hours. However, statistically no significant difference in occurrence of pain was found between various age groups (P > 0.05). The details are given in Figure 3.
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Fig. 1: Pain rating for each time interval in both groups

Fig. 2: Curve of pain for post operative time interval in gender

Fig. 3: Curve of pain for postoperative time internal in gender

DISCUSSION

The indiscriminate use of antibiotics is a common practice in dentistry. Dentists contribution to the problem of antibiotic resistance can be substantial as dentists prescribe approximately 10% of all prescribe antibiotics\textsuperscript{13}. Antibiotics have become integral part of prescriptions for a patient presenting with pain.

Although inter-appointment flare up is uncommon in cases of symptomatic irreversible pulpitis or periapical periodontitis, post operative pain occur frequently even if the treatment is appropriately performed\textsuperscript{14}. In a recent systematic review, it is reported that postoperative pain prevalence at 24 hours was 40% and was markedly reduced during the next 2 days\textsuperscript{15}. The results of the present study also showed that post operative pain did occur during the first 24 hours. Other studies also showed different results with post operative pain occurrence ranging from 1.1% to 16% and that age, gender, tooth type, pulpal status and pre operative pain play fundamental role\textsuperscript{16}.

O’Keefe\textsuperscript{17} found a strong relationship between pre and postoperative pain. Patients with moderate to severe pain prior to treatment were five times more likely to experience moderate to severe pain postoperatively. In the present study the same trend was observed, where mild to severe pain was recorded in all patients pre operatively. Post operatively, the occurrence of pain during the first 12 hours was 64.4% in group 1 and 66.7% in group 2 but markedly reduced to 11.1% and 15.6% in group 1 and group 2 in the next 72 hours. This decrease in pain may be considered as a result of the effect of analgesic.

Studies have shown that women reporting more post-endodontic pain than men\textsuperscript{18}, but differences in reports do exist in the literature\textsuperscript{19}. A study by Catherine et al\textsuperscript{20} reported that women were more likely to anticipate higher pain than men, however, experienced outcome level did not differ by gender. The results of the present study indicated that women experienced significantly higher pain (P=0.021) than men during the first 12 hours, with no significant difference in pain at 72 hours. Sex differences in presentation of clinical situation may relate to differences in care. Literature also supports evidence that women and men receive differential care for similar pain problems\textsuperscript{19,21}. Women seem to be more expressive of pain, where men tend to minimize symptoms. Women are more worried about pain, whereas men are more embarrassed by pain\textsuperscript{22}.

It is frequently assumed that aging results in loss of pain sensitivity. Experimental studies of acute pain responses do not show significant age related change in pain perception of healthy elderly subjects\textsuperscript{23}. In the present study no significant
differences in post-operative pain were found in different age groups.

The dentinal debris extrusion during endodontic procedures may induce acute inflammatory response. It has been shown that the amount of debris extruded through apical foramen was more in case of manual instrumentation (2.58 mg) than through NiTi rotary instruments (<.50 mg). Rotary instruments involve rotating action which cause less debris extrusion compared to manual technique with linear filing movements. In a recently published study, it has been shown that postoperative pain was significantly less when glide path was made by rotary path glider size 1, 2 and 3 compared to manual glide path by K-files. Since root canal preparation was done manually in this study, the extrusion of debris may be the primary cause of post operative pain.

There is no evidence that systemic antibiotics are justified in the treatment of pulpitis or apical periodontitis pre or post operatively. Mark et al reported that administration of systemic penicillin post operatively did not significantly reduce pain, percussion sensitivity or swelling. James et al also found no significant differences in pain relief for patients with untreated irreversible pulpitis who received antibiotics and those who did not. The results of the present study support the previous studies that antibiotics make no difference regarding the occurrence of postoperative pain (P > 0.05). Immediate post operative pain severity sometime slightly exceeds the pretreatment level simply due to inflammation.

**CONCLUSION**

From this study it was concluded that antibiotics have no significant role in the control of post endodontic pain.

**REFERENCES**


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