Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jobcr

Original Article

Clinical evaluation of 3 Mix and Other Mix in non-instrumental endodontic treatment of necrosed primary teeth

Rishi Nanda [a,*], *Monika Koul* [b], *Salil Srivastava* [c], *Vinod Upadhyay* [d], *Rahul Dwivedi* [e]

[a] *Research Scholar, Department of Paedodontics and Preventive Dentistry, Career Post Graduate of Dental Sciences and Hospital, Lucknow, Uttar Pradesh, India*
[b] *Professor and Head, Department of Paedodontics and Preventive Dentistry, Career Post Graduate Institute of Dental Sciences and Hospital, Lucknow, Uttar Pradesh, India*
[c] *Professor and Head, Department of Pharmacology, Career Post Graduate of Dental Sciences and Hospital, Lucknow, Uttar Pradesh, India*
[d] *Reader, Department of Paedodontics and Preventive Dentistry, Career Post Graduate Institute of Dental Sciences and Hospital, Lucknow, Uttar Pradesh, India*
[e] *Senior Lecturer, Department of Paedodontics and Preventive Dentistry, Career Post Graduate Institute of Dental Sciences and Hospital, Lucknow, Uttar Pradesh, India*

ARTICLE INFO

Article history:
Received 17 June 2014
Accepted 5 August 2014
Available online 27 August 2014

Keywords:
LSTR
3 Mix
Other Mix

ABSTRACT

Problem considered: The objective was to evaluate and compare the clinical and radiographic efficacy of two different combinations of antibacterial drugs when used in non-instrumental endodontic treatment of necrosed primary teeth.
Materials and method: Forty teeth were randomly divided into two groups, viz. groups A and B having 20 teeth each. In Group A, 3 Mix (ciprofloxacin, metronidazole, and minocycline) and in Group B, Other Mix (ciprofloxacin, ornidazole, and minocycline) mixed with propylene glycol were used. Medication cavities of Group-A and B were filled with 3 Mix and Other Mix respectively followed by restoration of teeth. Clinical evaluation was done at 3 months whereas, clinical and radiographic evaluation was done at 6 and 12 months, respectively.
Results: Both the groups showed 100% clinical success whereas, radiographic success rate was 81% with 3 Mix and 92% with Other Mix but, was not statistically significant.
Conclusions: Both the antibacterial pastes can be used effectively in non instrumental endodontic treatment of necrosed primary teeth and require more clinical trials to prove its efficacy.

* *Corresponding author*. Tel.: +91 9235731249.
E-mail address: nanda.rishinanda.rishi@gmail.com (R. Nanda).
http://dx.doi.org/10.1016/j.jobcr.2014.08.003

1. Introduction

Periapical pathosis is one of the main causes for bacterial infection of the periradicular tissues. In order to improve the prognosis, the bacteria remaining in the root dentine or in the periradicular tissues should be eliminated without damaging the tissues.[1] Bacteria in superficial layers of infected root canal walls can be easily removed by conventional root canal treatment, while bacteria in the deep layers of root canal dentine may leak out to periapical regions and cause complications. In order to sterilize infected root dentine, especially the deep layers, antibacterial medicaments are useful.[2]

Cariology Research Unit of Niigata University School of Dentistry has developed the concept of Lesion sterilization and tissue repair (LSTR) therapy that employs a mixture of antibacterial drugs for disinfection.[3] The infection of the root canal system is considered to be a polymicrobial infection, consisting of both aerobic and anaerobic bacteria. It is unlikely that any single antibiotic could result in an effective sterilization of the canal due to the complexity of the root canal infection. Since the overwhelming majority of bacteria in the root canal wall consist of obligate anaerobes, metronidazole should be selected as first choice among the antibacterial drugs as it has a wide spectrum of bactericidal action against oral obligate anaerobes. However, metronidazole even at higher concentrations fails to eradicate all the bacteria from carious lesions and some bacteria remain resistant to metronidazole, indicating the necessity of some additional drugs like ciprofloxacin and minocycline to sterilize these lesions.[1] Ornidazole has been reported to have a longer duration of action, with better efficacy and slower metabolism compared with metronidazole.[4] The application of antibacterial drugs may represent a way to eradicate bacteria during root canal treatment. Hence this study was conducted to evaluate two combinations of drugs each comprising of three antibiotics in non instrumental endodontic treatment (NIET) of necrosed primary teeth.

2. Methods

Forty necrosed primary molars either due to caries or trauma, indicated for pulpectomy showing one or more signs and symptoms such as pain, tender to percussion, mobility (grade I, II), presence of abscess or sinus tract and radiolucency in furcation area, were selected from 38 healthy children with age group of 4–10 years. Teeth excluded from the study were showing radiographic evidence of excessive internal or external root resorption, perforated pulpal floor, excessive bone loss in furcation area involving underlying tooth germ and non restorable teeth. The children were randomly divided into two groups, Group A and Group B having 20 teeth each. In Group A, medication cavities were filled with 3 Mix (*ciprofloxacin, metronidazole and minocycline*), whereas in Group B, Other Mix (*ciprofloxacin, ornidazole and minocycline*) was used.

Antibacterial drugs such as ciprofloxacin, metronidazole, minocycline, and ornidazole in pure salt form (KAN HEALTH CARE PVT. LTD. NEW DELHI, INDIA) were used. These drugs were kept separately in tightly capped porcelain containers to prevent exposure to light and moisture. A small amount of silica gel in a bag was placed inside the container to maintain low humidity and stored in refrigerator. The drugs were used within a month of preparation and the antibacterial paste was prepared just before use.

2.1. Group A

The drugs (*ciprofloxacin, metronidazole and minocycline*) were mixed in the ratio of 1:3:3 (by weight, measured by mono pendulum micro weighing machine) with 1 part of propylene glycol on glass slab with glass spatula to form a paste.

2.2. Group B

The drugs (*ciprofloxacin, ornidazole and minocycline*) were mixed in the ratio of 1:3:3 (by weight, measured by mono pendulum micro weighing machine) with 1 part of propylene glycol on glass slab with glass spatula to form a paste.

The clinical procedure was performed under rubber dam isolation. As the teeth in the study were non-vital therefore did not require local anesthesia to be administered prior to procedure. In each tooth the cavity was prepared depending upon the extent of the lesion and caries was removed, making sure that no overhanging tooth structure left in order to provide good access to coronal pulp. Access opening was done with No. 014 round carbide bur under slow speed and roof of the pulp chamber removed followed by extirpation of necrotic coronal pulp, under copious irrigation with normal saline (0.9% w/v) and drying with cotton pellets to ensure visualization of the canal orifices.

After this, canal orifices were enlarged to receive medicament termed as "medication cavity" which was 1 mm in diameter and 2 mm deep. This was accomplished using a round bur, following which cavities were cleaned and irrigated with normal saline and dried using cotton pellets. Then, the medication cavities of Group-A and Group-B were filled with 3 Mix and Other Mix respectively and teeth restored with glass ionomer cement (Type-IX) followed by S.S Crown. The whole procedure was completed in one visit and an immediate post operative IOPA radiograph was recorded.

In each patient clinical evaluation was done at 3 months whereas, clinical and radiographic evaluation was done at 6 months and 12 months respectively (Figs. 1 and 2). The treated cases were considered clinically successful if there was absence of spontaneous pain, tenderness to percussion, mobility, abscess and sinus tract. Radiographically, success in the cases was considered when radiolucency decreased or remained same. Increase in radiolucency at subsequent visit was considered a radiographic failure.

3. Results

Discrete (categorical) data were summarized as number (no.) and percentage (%). Categorical groups were compared by Fisher's exact test or chi-square (χ^2) test wherever applicable. A two-sided ($\alpha = 2$) p value less than 0.05 ($p < 0.05$) was considered statistically significant. The observations were based on clinical and radiographic evaluation.