

Original Research

A comparative study of formocresol and MTA in primary molars

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ABSTRACT:

Background: Pulpotomy is indicated in primary molars when the radicular pulp tissue is healthy or is capable of healing after surgical amputation of the affected or infected coronal pulp. The present study compared formocresol and MTA in primary molars. **Materials & Methods:** 80 children with carious deciduous molars were randomly divided into group I which comprised of formocresol and group II had MTA materials. All teeth were restored with stainless steel crown after 24 hours. The patients were recalled at 1 month, 3 months and 6 months and evaluated clinically. **Results:** There were 18 males and 22 females in group I and 20 males and 20 females in group II. pain was present in 2 patients at 24 hours only, swelling in 1 patient at 24 hours and change in colour in 24 hours in 11 patients in group I. The difference was significant ($P < 0.05$). Pain was present in 2 patients at 24 hours only, mobility in 1 patient at 24 hours and change in colour in 24 hours in 6 patients in group II. The difference was significant ($P < 0.05$). **Conclusion:** MTA can be efficiently used as pulpotomy agent with better results in deciduous molar.

Key words: Deciduous teeth, MTA, Pulpotomy

Received: 15 October, 2021

Accepted: 22 November, 2021

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This article may be cited as: Sharma M. A comparative study of formocresol and MTA in primary molars. J Adv Med Dent Scie Res 2021;9(12):73-76.

INTRODUCTION

Pulpotomy is indicated in primary molars when the radicular pulp tissue is healthy or is capable of healing after surgical amputation of the affected or infected coronal pulp. Pulpotomy is regarded as failure if one or more of the following clinical or radiographic pathological signs exist: pain, swelling, fistula, periapical or inter-radicular radiolucency and pathologic internal or external root resorption. Signs of failure can be seen on radiographs long before they are expressed clinically.

Formocresol has been critically evaluated for its toxic effects on pulp tissue. For decades formocresol has been a popular pulpotomy medicament. Concerns have been raised about the toxicity and potential carcinogenicity of formocresol in humans, and alternatives have been proposed to maintain partial pulp vitality.³

MTA have excellent proprieties such as sterility, radiopacity, resistance to moisture, good sealability against bacterial microleakage, and bioinduction. Due these proprieties, it stimulates mechanisms responsible for the bioremineralization and resolute of periapical disease that can improve treatment outcomes.⁴ MTA, with an excellent long- term

prognosis, relative ease at which it can be used and with its numerous exciting clinical applications promises to be one of the most versatile materials of this century in the field of dentistry. Over the last 70 years, formocresol (FC) has been a popular material used in the pulpotomy procedure, mainly because it is easy to use and it ensures high clinical success rates. However, several studies have shown that FC has hazardous adverse effect, such as mutagenicity and cytotoxicity. Therefore, a variety of medicaments and nonpharmacologic alternatives have been proposed in the literature to replace FC, such as glutaraldehyde (GH), calcium hydroxide (CH), freeze-dried bone, ferric sulphate (FS), mineral trioxide aggregate (MTA), electrosurgery, and lasers. The present study compared formocresol and MTA in primary molars.

MATERIALS & METHODS

The present study was conducted among 80 children with carious deciduous molars.

Ethical clearance has been taken from institution before the commencement of study. Teeth were selected for pulpotomy. Parents' consent was obtained before starting the study.

Demographic data such as name, age, gender etc. was recorded. The selected teeth were randomly divided into group I which comprised of formocresol and group II had MTA materials. Each group comprised of 40 teeth. All teeth were restored with stainless steel

crown after 24 hours. The patients were recalled at 1 month, 3 months and 6 months and evaluated clinically. Results thus obtained were subjected to statistical analysis. P value <0.05 was considered significant.

RESULTS

Table I Distribution of teeth

Groups	Group I	Group II
Method	Formocresol	MTA
M:F	18:22	20:20

Table I, graph I shows that there were 18 males and 22 females in group I and 20 males and 20 females in group II.

Graph I Distribution of teeth

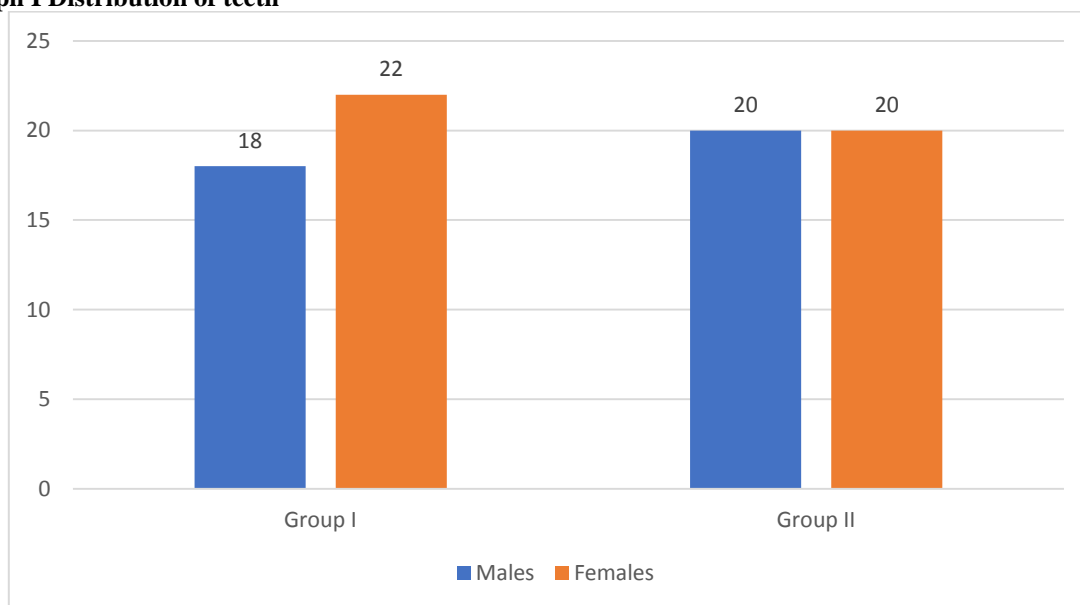


Table II Clinical parameters in group I

Parameters	24 hours	1 month	3 months	6 months	P value
Pain	2	0	0	0	0.17
Mobility	0	0	0	0	-
Swelling	1	0	0	0	0.21
Sinus	0	0	0	0	-
Change in colour	12	0	0	0	0.01

Table II shows that pain was present in 2 patients at 24 hours only, swelling in 1 patient at 24 hours and change in colour in 24 hours in 12 patients in group I. The difference was significant (P<0.05).

Table III Clinical parameters in group II

Parameters	24 hours	1 month	3 months	6 months	P value
Pain	2	0	0	0	0.17
Mobility	1	0	0	0	0.21
Swelling	0	0	0	0	-
Sinus	0	0	0	0	-
Change in colour	6	0	0	0	0.01

Table III shows that pain was present in 2 patients at 24 hours only, mobility in 1 patient at 24 hours and change in colour in 24 hours in 6 patients in group II. The difference was significant (P<0.05).

DISCUSSION

Pulpotomized teeth help in maintaining arch integrity by allowing preservation of the teeth that would otherwise be destined for extraction.¹The current

recommendation supersedes the previous pulp therapy guideline² on the vital pulp therapies in primary teeth with deep caries lesions and does not cover non-vital pulp therapies, pulp therapy for immature permanent

teeth, or pulp therapy for primary teeth with traumatic injuries. This clinical practice guideline adheres to the Appraisal of Guidelines Research and Evaluation (AGREE) reporting checklist. Failure of pulpotomy in primary molars was attributed to several factors: (1) Erroneous diagnosis of a chronically inflamed radicular pulp as non-inflamed and non-infected, (2) the irritating effect of eugenol as a component of the pulp space filling material, and (3) attempt to preserve a tooth with a deep proximal carious lesion, a condition leading to leakage due to incomplete coverage. The present study compared formocresol and MTA in primary molars.

In present study we found that there were 18 males and 22 females in group I and 20 males and 20 females in group II. Holan et al¹² compared the success rates of formocresol pulpotomy in primary molars restored with stainless steel crowns (SSC) to those restored with amalgam (AM). Radiographs of pulpotomized primary molars restored with SSC or AM in the principal author's pediatric dentist practice were evaluated and defined as a "failure" when one or more of the following signs were present: internal (IR) or external (ER) root resorption and periapical (PR) or inter-radicular (IRR) radiolucency. Pulp canal obliteration was not regarded as failure. 341 molars were available for follow-up evaluations ranging from 6 to 103 months. Forty-seven (14%) teeth were defined as "failure," with a rate of 13% (36/287) for teeth restored with SSC and 20% (11/54) for AM. This difference was not statistically significant ($P>0.1$). Failure rates of 2 surfaces AM was 23% (7/30), much higher than that of one surface AM (10%, 2/20). Most of the failed teeth presented more than one pathologic finding, with IR being the most frequently observed (36%), followed by ER (31%), IRR (22%) and PR (11%). Pulp canal obliteration was detected in 80% of the teeth, with similar rates in both groups. Failures were observed initially after a mean follow-up of 27 and 29 months in teeth restored with AM and SSC, respectively. Pulpotomized primary molars can be successfully restored with one surface amalgam if their natural exfoliation is expected within not more than two years.

We found that pain was present in 2 patients at 24 hours only, swelling in 1 patient at 24 hours and change in colour in 24 hours in 11 patients in group I. Durmus et al¹³ included 120 primary molars in 58 children 5–9 years of age who underwent an identical conventional pulpotomy technique; the molars were allocated to FC, FS, and DL groups. After removal of the coronal tissue, complete hemostasis of the remaining pulp in the DL group was achieved by DL at 1.5 W, 30 Hz, and 50 mJ, with a 10 sec exposure time. For the FC group, diluted FC (1:5 Buckley's formocresol) was used for 5 min., and for the FS group, a 15.5% FS solution was used for 15 sec. Treatments in all groups were completed with stainless steel crowns and monitored clinically and radiographically at 1, 3, 6, 9, and 12 months. The

clinical success rates at 12 months were 97%, 95%, and 100%, whereas the radiographic success rates were 87%, 79%, and 75%, for the FC, FS and DL groups, respectively. The differences in the results were not statistically significant according to the v_2 test ($p>0.05$).

Naik et al¹⁴ in their study found that of the 50 teeth selected, 3 were not available for further follow-up after 1 month. The follow up after 1 month, 3 months and 6 months did not reveal any clinical or radiographic pathological findings in the rest of the 47 teeth. Hence, no statistical analysis was performed regarding the success of the treatment. The only significant findings were the discoloration of 60% of the teeth where MTA was used as a medicament after 24 hours, but which was later masked by restoring with a stainless- steel crown.

CONCLUSION

Author found that MTA can be efficiently used as pulpotomy agent with better results in deciduous molar.

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