

## ORIGINAL RESEARCH

### Assessment of efficacy of formocresol and mineral trioxide aggregate in deciduous teeth

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#### ABSTRACT:

**Background:** The facial injury leaves everlasting impact on psychological development and behavior of patients. The present study was conducted to determine the cases of maxillofacial trauma in children. **Materials & Methods:** The present study was conducted on 126 children with trauma. Maxillofacial trauma involving facial bones and reason for trauma was recorded. **Results:** Age group 6-8 years had 40 boys and 26 girls, 9-11 years had 20 boys and 24 girls and 12-15 years had 10 boys and 6 girls. Maxilla was involved in 30, angle in 28, zygoma in 12, nasal bone in 12, body in 25 and symphysis in 19. The difference was non-significant ( $P > 0.05$ ). The reason for trauma was road side accident in 31, fall in 40, sports injury in 45 and domestic violence in 10. The difference was significant ( $P < 0.05$ ). **Conclusion:** Authors found that common reasons for pediatric trauma are the road side accidents, sports injury and fall.

**Key words:** Children, Trauma, Symphysis

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#### INTRODUCTION

The principle of pulp treatment in primary dentition is that tooth should remain in mouth in a non-pathological healthy condition to fulfill its role in primary dentition.<sup>1</sup> Pulpotomy is a common treatment done to retain cariously involved primary molars that would otherwise be extracted. In pulpotomy, the coronal part of the pulp is removed, and the remaining pulp tissue is covered with a medicament to maintain the vitality of the radicular pulp.<sup>2</sup> The pulpotomy procedure is based on the rationale that the radicular pulp tissue is healthy or is capable of healing after surgical amputation of the affected or infected coronal pulp.<sup>3</sup>

Although many materials such as FC, ferric sulfate, glutaraldehyde, calcium hydroxide, zinc oxide eugenol (ZOE) have been used over the years for pulpotomy procedure, the ideal material should meet certain requirements such as being bactericidal, harmless to the pulpal tissue and surrounding structures, promoting healing of the radicular pulp, not interfering with normal physiological root resorption, and preserving the radicular pulp without any clinical or radiographic symptoms.<sup>4</sup>

Formocresol (FC) has been a popular pulp medicament most frequently used in clinical practice for pulpotomy in primary teeth. Doubts have arisen as to the safety of FC in spite of its efficacy. These findings have led to the search for a suitable alternative to replace FC. This replacement medicament must be equally effective but without the undesirable side-effects of FC.<sup>5</sup>

Mineral trioxide aggregate contains tricalcium silicate, tricalcium aluminate, tricalcium oxide and silicon dioxide. Its mechanism of action is similar to calcium hydroxide and induces osteogenic phenotype activities like alkaline phosphatase, osteonidogen, osteonectin, osteocalcin, osteopontin and results in hard tissue bridge formation.<sup>6</sup> The present study was conducted to compare formocresol and mineral trioxide aggregate in deciduous teeth.

#### MATERIALS & METHODS

The present study was conducted in the department of Pedodontics. It comprised of 40 deciduous molar of children aged 4- 8 years of age. The study protocol was

approved from institutional ethical committee. A written consent was obtained from parents of children. General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 20 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA. Teeth were compared clinically at 3 months and 6 months intervals. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I (20)	Group II (20)
Material	Formocresol	Mineral trioxide aggregate

Table I shows that patients were divided into 2 groups of 20 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA.

**Table II Assessment of clinical findings**

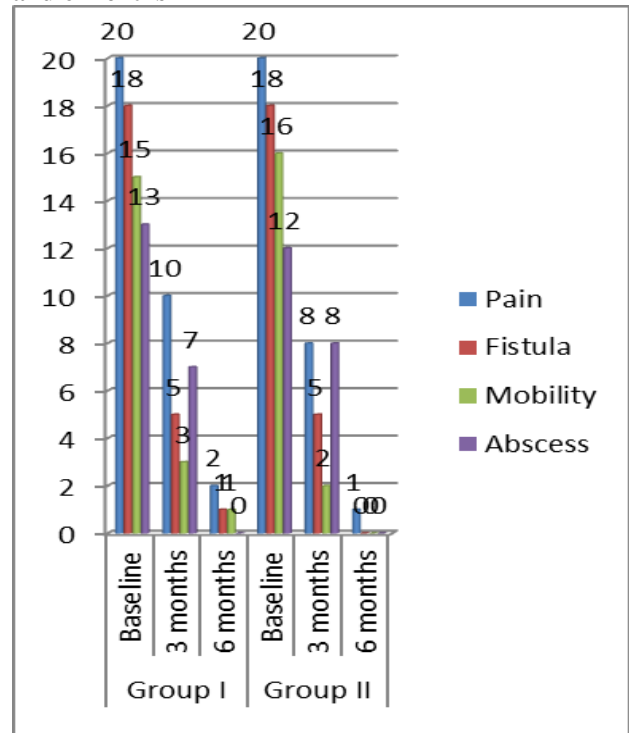
Clinical findings	Group I			Group II		
	Baseline	3 months	6 months	Baseline	3 months	6 months
Pain	20	10	2	20	8	1
Fistula	18	5	1	18	5	0
Mobility	15	3	1	16	2	0
Abscess	13	7	0	12	8	0

Table II shows that there was comparatively less pain, fistula formation, abscess and mobility in group II as compared to group I recorded at 3 months and 6 months (P< 0.05).

**DISCUSSION**

Pulpotomy is indicated when caries removal results in pulp exposure of primary tooth with normal or reversible pulpitis or after traumatic pulp exposure. The coronal pulp tissue is amputated and remaining radicular pulp tissue is judged to be vital by clinical or radiographic.<sup>7</sup>Pulpotomy in primary dentition is developed by devitalization by destroying the vital tissue such as formocresol and electrosurgery etc. Other method is by regeneration - stimulation of dentine bridge with mineral trioxide aggregate (MTA). The present study was conducted to compare formocresol and mineral trioxide aggregate in deciduous teeth.

**Graph I Assessment of clinical findings at 3 months and 6 months**



In present study, patients were divided into 2 groups of 20 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA. Olatosi et al<sup>8</sup> in their study fifty primary molars, with deep carious lesion that exposed a vital but asymptomatic pulp, in 37 children aged 4-7 years were treated with conventional pulpotomy procedure. The teeth were divided randomly into two groups. Group I (FC) and group II (MTA). The treated teeth were evaluated clinically and radiographically and were followed-up for 12 months. At the end of the 12 months follow-up, the clinical success rates for FC and MTA were 81% and 100%, respectively. There was a statistically significant difference (P = 0.04) between the clinical success rates of FC and MTA. While the radiographic success rates for FC and MTA were 81% and 96%, respectively, there was no statistically significant difference between the radiographic success of MTA and FC.

In present study, there was comparatively less pain, fistula formation, abscess and mobility in group II as compared to group I recorded at 3 months and 6 months (P< 0.05). Srinivasan et al<sup>9</sup> clinically and radiographically evaluated Mineral Trioxide Aggregate (MTA) as an agent for pulpotomy in primary teeth and to compare it with that of Formocresol (FC) pulpotomy. Seventy first and second primary mandibular molars of children were chosen on patients who required minimum two pulpotomies in either arch or same arch. After the standardized technique of Pulpotomy with MTA and Formocresol, all molars were treated with a thick mix of Zinc oxide Eugenol cement into the coronal pulp chamber followed by preformed stainless steel crown. The children were followed up for clinical and radio graphical

examination after 6, 12 and 24 month for Pain, Swelling, Sinus/fistula, Periapical changes, Furcation radiolucency and internal resorption. MTA represents 97% clinical success rate in comparison to Formocresol with 85% success. Radiographically also MTA showed more promising results with 88.6% success in comparison to Formocresol with 54.3%.

WHO has estimated the use of formocresol through air, water and food at 1.5-to 14-mg/ day (mean 7.8 mg/day). The estimated dose of formaldehyde associated with one pulpotomy procedure, assuming a 1:5 dilution of formocresol placed on a number 4 cotton pellets that has been squeezed dry, is 0.02 - 0.1 mg. Thus, there is no inconsequential risk of carcinogenesis associated with the use of formaldehyde in pediatric pulp therapy. Mineral trioxide aggregate was introduced as a potential alternative dressing material for pulpotomy of primary molars with features of stimulating cytokine release from bone cells, inducing hard tissue formation, a dentinogenic effect on the pulp, antimicrobial properties, and ability to maintain pulp integrity after pulp capping and pulpotomy without cytotoxic effect.<sup>10</sup>

## CONCLUSION

Mineral Trioxide Aggregate (MTA) found to be better as compared to formocresol. There was less pain, fistula formation, abscess and mobility.

## REFERENCES

1. Walker MP, Diliberto A, Lee C. Effect of setting conditions on mineral trioxide aggregate flexural strength. *J Endod* 2006; 32: 334–336.
2. Torabinejad M, Pitt Ford TR, Abedi HR, Kariyawasam SP, Tang HM. Tissue reaction to implanted Root End filling materials in the Tibia and Mandible of Guinea Pigs. *J Endod*, 1998; 24: 468–471.
3. Kogan P, He J, Glickman GN, Watanabe I. The effects of various additives on setting properties of MTA. *J Endod* 2006; 32: 569–572.
4. Danesh G Dammaschke T, Gerth HUV, Zandbiglari T, Schafer E. A Comparative study of selected properties of ProRoot mineral trioxide aggregate and two Portland cements. *Int Endod J* 2006; 39: 213–219.
5. S Naik, Amitha M Hegde. Mineral trioxide aggregate as a pulpotomy agent in primary molars, An in vivo study. *Jn.Indian Soc Pedod Prev Dent* 2005; 23: 13–16.
6. Aeinehchi M, Dadvand S, Fayazi S, Bayat-Movahed S. Randomized controlled trial of mineral trioxide aggregate and formocresol for pulpotomy in primary molar teeth. *Int Endod J* 2007;40:261-7.
7. Ford TR, Torabinejad M, Abedi HR, Bakland LK, Kariyawasam SP. Using mineral trioxide aggregate as a pulp-capping material. *J Am Dent Assoc*, 127: 1491–1494, 1996.
8. Olatosi O O, Sote E O, Orenuga O O. Effect of mineral trioxide aggregate and formocresol pulpotomy on vital primary teeth: A clinical and radiographic study. *Niger J Clin Pract* 2015;18:292-6.
9. Srinivasan D, Jayanthi M. Comparative evaluation of formocresol and mineral trioxide aggregate as pulpotomy agents in deciduous teeth. *Indian J Dent Res* 2011; 22:385-90.

10. Ranly DM, Horn D. Assessment of the systemic distribution and toxicity of formaldehyde following pulpotomy treatment: Part two. *ASDC J Dent Child* 1987;54:40-4.