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ORIGINAL RESEARCH

A comparative assessment of formocresol and mineral trioxide aggregate in deciduous teeth

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ABSTRACT:
Background: Pulpotomy is indicated when caries removal results in pulp exposure of primary tooth with normal or reversible pulpitis or after traumatic pulp exposure. The present study was conducted to compare formocresol and mineral trioxide aggregate in deciduous teeth. **Materials & Methods:** The present study was conducted on 50 deciduous molar of children aged 4- 8 years of age of both genders. Patients were divided into 2 groups of 25 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. Teeth were considered to be clinically successful in the absence of spontaneous pain, draining fistula, swelling or abscess and mobility. **Results:** Patients were divided into 2 groups of 25 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA. 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 ($P< 0.05$). **Conclusion:** Authors found Mineral Trioxide Aggregate (MTA) better in terms of pain, fistula formation, abscess and mobility as compared to formocresol.
Key words: Formocresol, Mineral Trioxide Aggregate, Pulpotomy

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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. 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.[1]

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).[2]

Formocresol is a compound consisting of 19% formaldehyde, 35% cresol, 15% glycerine and 31% water base used in vital pulpotomy of primary teeth and as a temporary intracanal medicament during root canal therapy. Due to high toxicity and availability of alternative solutions and intracanal medicaments, formocresol is considered obsolete in dentistry.[3]

Mineral trioxide aggregate contains tricalcium silicate, tricalcium aluminate, tricalcium oxide and silicon di-oxide. Bismuth is added to get radiopacity. 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.[4] 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 50 deciduous molar of children aged 4- 8 years of age of both genders. 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 25 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.

Teeth were considered to be clinically successful in the absence of spontaneous pain, draining fistula, swelling or abscess and mobility. 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	Group II
Agent	Formocresol	mineral trioxide aggregate
Number of patients	25	25

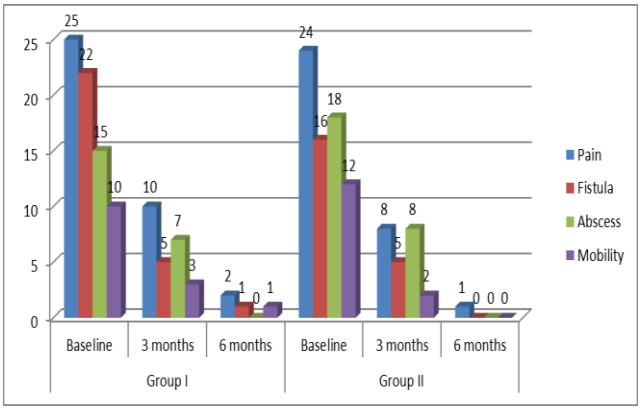
Table I shows that patients were divided into 2 groups of 25 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA.

Table II Assessment of clinical findings at 3 months and 6 months

Clinical findings	Group I			Group II		
	Baseline	**3 months**	**6 months**	**Baseline**	**3 months**	**6 months**
Pain	25	10	2	24	8	1
Fistula	22	5	1	16	5	0
Abscess	15	7	0	18	8	0
Mobility	10	3	1	12	2	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).

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



DISCUSSION

Various materials have been formulated, tested and standardized to obtain maximum benefit for good clinical performance. Mineral Trioxide Aggregate (MTA) was introduced by Mohmoud Taorabinejad at Loma Linda University, California, USA in 1993 and was given approval for endodontic use by the U.S. Food and Drug Administration in 1998. MTA is available in two types based on the color known as gray and white MTA. Scanning electron microscopy (SEM) and electron probe microanalysis characterized the differences between GMTA and WMTA and found that the major difference between GMTA and WMTA is in the concentrations of Al_2O_3, MgO and FeO.[5]

Mineral trioxide aggregate (MTA) is a fine hydrophilic powder available is single use sachets of 1 gram. Some companies also provide premeasured water sachets for ease of use. Some of the commercially available MTA are ProRoot MTA (Dentsply), White ProRoot MTA (Dentsply), MTA- Angelus (Solucoes Odontologicas), MTA- Angelus Blanco (Solucoes Odontologicas), MTA Bio (Solucoes Odontologicas).[6] The present study was conducted to compare formocresol and mineral trioxide aggregate in deciduous teeth.

In present study, patients were divided into 2 groups of 25 each. In group I, pulpotomy was done with formocresol and in group II, pulpotomy was done with MTA. Naik et al.[7] advocated that the powder water ratio for MTA should be 3:1(P: W). Mixing can be done on paper pad or on a glass slab using a plastic or metal spatula to achieve putty like paste consistency. This mix should be cover with moistened cotton pellet to prevent dehydration of mix.

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. Aeinehchi et al[8] in their study found significant difference in mobility, periodontal ligament widening and inter - radicular radiolucency between two groups at the end of 12 months. Histologically, in MTA group, a layer of new dentine formation with less dentinal tubules at the pulpotomized site was found. In formocresol group, increased inflammatory cells, a zone of atrophy, were noted in radicular portion of pulp.

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.[9]

CONCLUSION

Authors found Mineral Trioxide Aggregate (MTA) better in terms of pain, fistula formation, abscess and mobility as compared to formocresol.

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