Effectiveness of Formocresol Versus Mineral Trioxide Aggregate Pulpotomies

Nadareh M Naseri, DDS, John H Unkel, DDS, MD, Elizabeth Berry, DDS, Dennis Reinhartz, PhD, Judy Reinhartz, PhD
Bon Secours St. Mary's Hospital of Richmond, Richmond, VA

PURPOSE

- To compare the effectiveness of formocresol and mineral trioxide aggregate (MTA) in a controlled environment for antimeric posterior primary teeth requiring pulpotomy therapy.

BACKGROUND

- Pulpotomy therapy is performed to maintain primary teeth in the dental arch and to restore them to health and functionality.
- Indications for pulpotomy therapy include caries removal penetrating/approximating pulp chamber, trauma, and vital pulp therapy due to reversible pulpitis.[1-4]
- Pulpotomies are performed by accessing the pulp chamber, removing coronal pulp tissues, applying a medicament to amputated pulp stumps, and restoring with a non-leaking restoration.[1]
- Different medicaments have been used to achieve best outcomes, including but not limited to formocresol and MTA.[2-4]
- Formocresol is the most universally taught, easy to handle, and low cost, but is questioned due to its potential of carcinogenicity.[2] MTA is biocompatible, easy to handle, and stimulates dentin formation, but its use is limited due to its relatively new application in primary teeth and elevated costs. [2-4]
- Both formocresol and MTA are used as pulpotomy medicaments, and studies comparing the effectiveness of these materials are less common.

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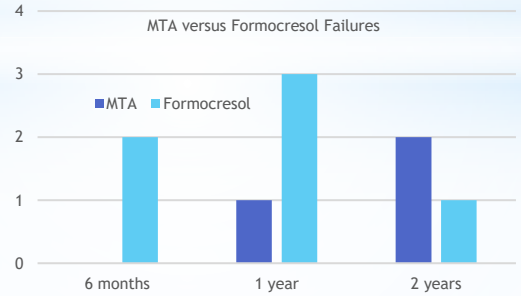
METHODS

- The study was organized as a prospective, randomized controlled trial in a pediatric population, ages 2-6 years old, who had caries on antimeric teeth in the same arch necessitating pulpotomy therapy in a general anesthesia setting. Teeth included in this study were reported as asymptomatic and with no clinical and/or radiographic evidence of pulpal pathology.
- Antimeric teeth were pulpotomy treated; one with formocresol, one with MTA, selected at random was which tooth would receive which medicament. Teeth were restored with a stainless-steel crown.
- Patients were evaluated at follow up intervals of 2 weeks, 6 months, and 1 year and 2 years.
- Treatment was considered a success if pulpotomy treated tooth had no radiographic furcal/apical radiolucency, no clinical signs/symptoms of sensitivity to percussion and palpation, gingival edema or erythema, or tooth mobility.



DATA ANALYSIS

- Treatment outcomes for each medicament were categorized on two independent dimensions, success versus failure.
- Descriptive statistics and frequency summaries were generated.
- A Chi-square will be used to determine if there was a significant relationship between two categorical variables once an adequate n obtained.

RESULTS

- A total of 47 subjects were included in this study, with 23 subjects completing the 6 month follow-up, 18 the 1 year follow-up and 12 at the 2 year-up.
- There were 2 formocresol pulpotomy failures at the 6 month follow-up, 3 formocresol and 1 MTA pulpotomy failures at the 1 year follow-up, and 1 formocresol and 2 MTA pulpotomy failures at the 2 year follow-up.
- Overall, there were more formocresol pulpotomy failures (n=6) than MTA pulpotomies (n=2) after 2 years.
- A Chi-square analysis was not performed due to low sample size at this time.

CONCLUSIONS

- Formocresol and MTA appear to be effective pulpal medicaments for primary teeth needing pulpotomies due to extensive caries.
- Further data collection is necessary to complete statistical analysis.

LIMITATIONS

- Providers were not calibrated in pulpotomy procedures.
- Current study suffered from small sample size and had a significant loss of subject retention.
- Inability to keep patients on specific recall is a limitation to this study.
- In patients with pre-cooperative behavior, radiographic evaluation at the one year follow up was not possible.