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## ORIGINAL RESEARCH

### A comparative evaluation of formocresol versus aloe vera as pulpotomy agent

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#### ABSTRACT:

**Background:** The present study was conducted to compare aloe vera versus formocresol as pulpotomy agent.

**Materials & Methods:** 96 patients requiring pulpotomy in primary mandibular first molars were divided into 2 groups. In group I teeth, pulpotomy medicament Buckley's FC was used and in group II teeth, Aloe vera gel was used.

**Results:** Clinical success rate at 3 months in group I was 100% and in group II was 95.4%. At 6 months it was 98.2% in group I and 97.1% in group II. Radiographic success rate at 3 months in group I was 100% and in group II was 96.2%. At 6 months it was 98% in group I and 97.3% in group II. The difference was non- significant ( $P > 0.05$ ).

**Conclusion:** The clinical and radiographic success of both groups were equally effective

**Key words:** Aloe vera gel, Pulpotomy, Formocresol.

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#### INTRODUCTION

Preservation of primary teeth before the eruption of permanent teeth is desirable since they help to determine the shape of dental arches, act as a natural space maintainer between teeth, prevent detrimental tongue and speech habits, conserve esthetics, and maintain chewing function.<sup>1</sup> Apart from that, they play an important role in growth, development, and maturation of the entire facio skeletal complex. Over the years, formocresol (FC) has remained as the gold standard for pulpotomy procedure due to its very high

and consistent results that date back to more than a century.<sup>2</sup> Despite FC's high success rate and its position as "gold standard" in pulpotomy, a substantial shift has been seen with the use of this medicament because of certain reasons. It contains formaldehyde which is regarded to be a potential carcinogenic and mutagenic compound and is thus very toxic and its use in dentistry is of great concern.<sup>3</sup> Herbal medicinal products such as Aloe vera, *Elaeagnus angustifolia*, turmeric, and *Copaifera langsdorffii* oil is used as a pulpotomy medicament

because of their low cytotoxicity compared to standard synthetic materials. Aloe vera is a traditional medicine that is used as a therapeutic agent.<sup>4</sup> Every part of the plant has been used in the treatment of various infections. It has anti-inflammatory, antifungal, antibacterial, antifungal, analgesic, and wound healing property. Several in vitro studies have been done using Aloe vera as a pulp dressing material proving its anti-inflammatory and wound healing property.<sup>5</sup> The present study was conducted to compare aloe vera versus formocresol as pulpotomy agent.

**MATERIALS & METHODS**

This study comprised of 96 patients requiring pulpotomy in primary mandibular first molars of both genders. All were informed regarding the study and their consent was obtained from their parents. Ethical

approval for the study was also obtained from institutional ethical committee.

Dara such as name, age, gender etc. was also recorded. An aseptic technique of pulpotomy was followed. Patients were divided into 2 groups. In group I teeth, pulpotomy medicament Buckley's FC was used and in group II teeth, Aloe vera gel was used. Patients were recalled at 3 and 6 months follow-up. The clinical and radiographic success were evaluated using Zurn and Seale criteria based on clinical signs (pain, tenderness to percussion, abscess, swelling, fistula, and pathologic mobility) and radiographic findings (radicular radiolucency, internal and external root resorption, periodontal ligament (PDL) space widening, and furcation radiolucency was used. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of teeth**

Groups	Group I	Group II
Medicament	Buckley's FC	Aloe vera gel
Number	48	48

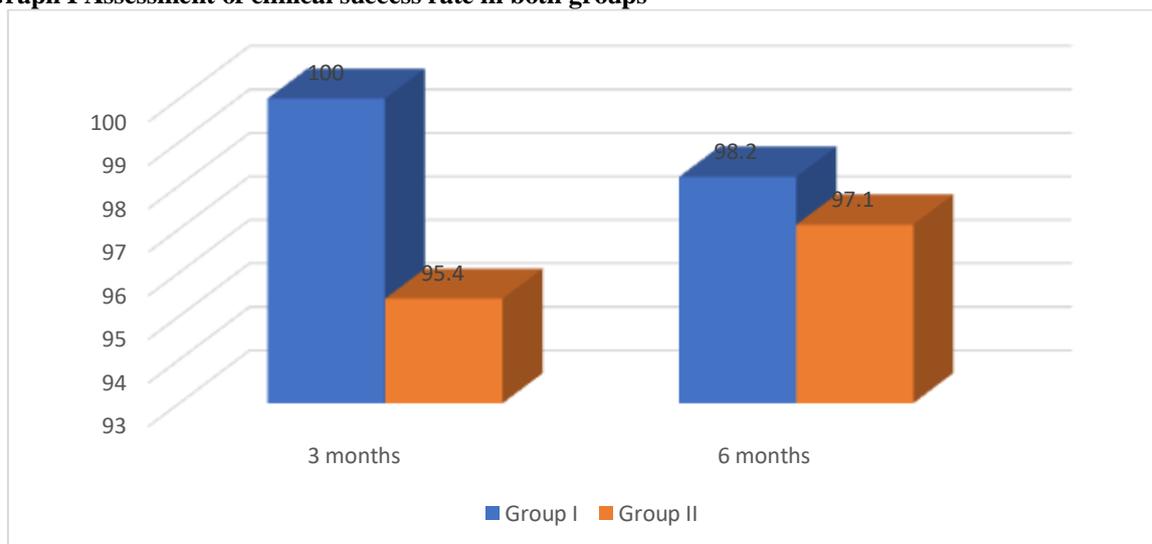
Table I shows that in group I teeth, pulpotomy medicament Buckley's FC was used and in group II teeth, Aloe vera gel was used. Each group had 48 teeth.

**Table II Assessment of clinical success rate in both groups**

Duration	Group I	Group II	P value
3 months	100	95.4	0.16
6 months	98.2	97.1	0.91

Table II, graph I shows that clinical success rate at 3 months in group I was 100% and in group II was 95.4%. At 6 months it was 98.2% in group I and 97.1% in group II. The difference was non-significant (P> 0.05).

**Graph I Assessment of clinical success rate in both groups**

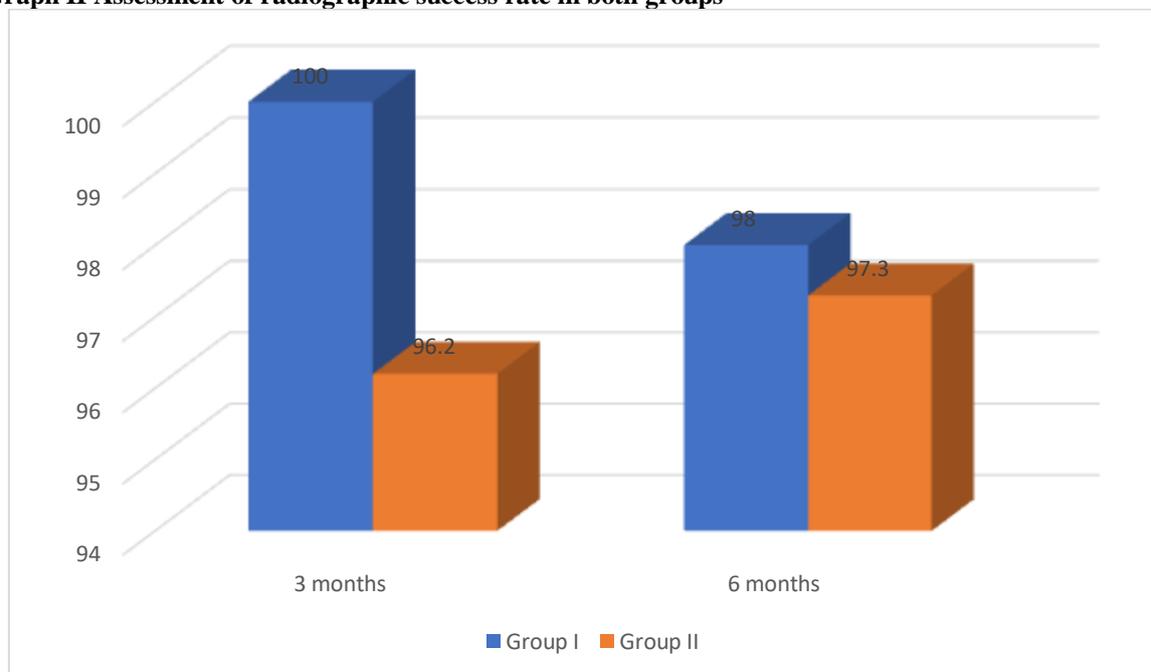


**Table III Assessment of radiographic success rate in both groups**

Duration	Group I	Group II	P value
3 months	100	96.2	0.11
6 months	98.0	97.3	0.97

Table III, graph II shows that radiographic success rate at 3 months in group I was 100% and in group II was 96.2%. At 6 months it was 98% in group I and 97.3% in group II. The difference was non-significant ( $P > 0.05$ ).

**Graph II Assessment of radiographic success rate in both groups**



**DISCUSSION**

Pulpotomy is one of the most widely accepted clinical procedures for treating cariously exposed pulp in primary teeth. The rationale of this technique is based on the healing ability of the radicular pulp tissue following surgical amputation of the affected or infected coronal pulp.<sup>6</sup> Pulpotomy can be performed using different techniques including; non-pharmacotherapeutic treatments or using pharmacotherapeutic approaches by dressing the pulp tissue with different medicaments or biological materials.<sup>7</sup> Formocresol (FC) has been the most widely used medicament universally taught and preferred for pulpotomized primary teeth; due to its ease in use, bacteriostatic and fixative properties and high clinical success rates up to 97%. Aloe vera is one of herbal natural material; it has anti-inflammatory, antibacterial, antifungal, antiviral, moisturizing and pain-relieving properties.<sup>8</sup> Acemannan is a major polysaccharide of Aloe vera gel, it has been recognized for its cytocompatibility and wound healing inducer. It promotes new dentine formation by stimulating primary human dental pulp cell proliferation, differentiation, extracellular matrix formation and mineralization.<sup>9</sup> The present study was conducted to compare aloe vera versus formocresol as pulpotomy agent.

In present study, in group I teeth, pulpotomy medicament Buckley's FC was used and in group II teeth, Aloe vera gel was used. Each group had 48 teeth. Kalra et al<sup>10</sup> in their study pulpotomy procedure was performed in sixty primary molar teeth which were randomly allocated to two groups, i.e., Aloe vera pulpotomy (Group A) and MTA pulpotomy (Group B). All the pulpotomized teeth were evaluated clinically and radiographically at 1, 3, 6, 9, and 12 months of time interval using predetermined criteria. The success rates between Groups A and B at the end of the 1<sup>st</sup> month were 24.1% and 96.4%, at the end of 3<sup>rd</sup> month were 57.1% and 100%, at the end of 6<sup>th</sup> month were 75% and 100%, at the end of 9<sup>th</sup> month were 66.6% and 100%, and at the end of 12 months were 100% and 100% respectively. The overall success rates at the end of 12-month follow-up period were 6.9% and 71.4%, respectively, after taking dropout patients into consideration, and the difference was statistically significant ( $P < 0.001$ ). We found that clinical success rate at 3 months in group I was 100% and in group II was 95.4%. At 6 months it was 98.2% in group I and 97.1% in group II. The radiographic success rate at 3 months in group I was 100% and in group II was 96.2%. At 6 months it was 98% in group I and 97.3% in group II. Subramanyam et al<sup>11</sup> in their study a total of 72

asymptomatic or symptomatic vital primary molars were selected and were assigned to two groups: group II: Buckley's FC, group II: Aloe vera gel. At three and 6 months follow-up, the clinical success rate of Aloe vera and FC was equally effective. Aloe vera showed a higher radiographic success rate compared to FC ( $p > 0.05$ ). At 6 months follow-up, FC showed a higher radiographic success rate compared to Aloe vera ( $p > 0.05$ ).

Gonna et al<sup>12</sup> compared effects of acemannan and formocresol as pulp-dressing agents clinically and radiographically in primary teeth. Thirty healthy children aged from four to eight years were selected. Pulpotomy was done in both groups; where group I treated by AHM, acemannan, as a dressing agent while formocresol used as a dressing agent in group II. The study cases were recalled after three, six, nine and twelve months for clinical and radiographic evaluation. The overall clinical success rate of acemannan group was 96.5%, while formocresol group was 89.6%. The two groups were clinically successful with no statistically significant difference between them ( $p = 0.148$ ). The radiographic success rate of acemannan group was 93.1%, while for formocresol group was 86.2%. There was no statistically significant difference between the two groups ( $p = 0.385$ ).

The limitation of the study is small sample size. Only two medicaments were compared.

## CONCLUSION

Authors found that the clinical and radiographic success of both groups were equally effective at the end of 6 months follow-up.

## REFERENCES

1. Hunter M and Hunter B. Vital pulpotomy in the primary dentition: attitudes and practices of Specialists in Paediatric Dentistry practising in the United Kingdom. *International Journal of Paediatric Dentistry*, 2003; 13(4): 246-50.
2. Purohit RN, Bhatt M, Purohit K, Acharya J, Kumar R and Garg R. Clinical and Radiological Evaluation of

- Turmeric Powder as a Pulpotomy Medicament in Primary Teeth: An in vivo Study. *Int J Clin Pediatr Dent*, 2017; 10(1): 37-40.
3. Khairwa A, Bhat M, Sharma R, Satish V, Maganur P and Goyal A K. Clinical and radiographic evaluation of zinc oxide with aloe vera as an obturating material in pulpectomy: an in vivo study. *J Indian Soc Pedod Prev Dent*, 2014; 32(1): 33-8.
4. Jittapiromsak N, Sahawat D, Banlunara W, Sangvanich P and Thunyakitpisa P. Acemannan, an extracted product from Aloe vera, stimulates dental pulp cell proliferation, differentiation, mineralization, and dentin formation. *Tissue Eng Part A*, 2010; 16(6): 1997-2006.
5. Mohammad SG, Raheel SA, and Baroudi K. Histological Evaluation of Allium sativum Oil as a New Medicament for Pulp Treatment of Permanent Teeth. *The journal of contemporary dental practice*, 2015; 16(2): 85-90.
6. Fuks AB and Eidelman E. Pulp therapy in the primary dentition. *Curr Opin Dent*, 1991; 1(5): 556-63.
7. Holan G, Fuks AB, Ketzl N. Success rate of formocresol pulpotomy in primary molars restored with stainless steel crown vs amalgam. *Pediatr Dent*. 2002;24(3):212-216.
8. Goyal P, Pandit IK, Gugnani N, et al. Clinical and radiographic comparison of various medicaments used for pulpotomy in primary molars: a randomized clinical trial. *Eur J Dent*. 2016;10(3):315-320.
9. Parisay I, Ghoddusi J, Forghani M. A review on vital pulp therapy in primary teeth. *Iran Endod J*. 2015;10(1):6-15.
10. Kalra M, Garg N, Rallan M, Pathivada L, Yeluri R. Comparative evaluation of fresh Aloe barbadensis plant extract and mineral trioxide aggregate as pulpotomy agents in primary molars: A 12-month follow-up study. *Contemp Clin Dent* 2017;8:106-11.
11. Subramanyam D, Somasundaram S. Clinical and Radiographic Evaluation of Aloe vera vs Formocresol as a Pulpotomy Medicament in Primary Molars: A Double Blinded Randomized Controlled Trial. *International Journal of Clinical Pediatric Dentistry*. 2020 Mar;13(2):138.
12. Gonna S, Ghoname N, Kabbash A, Yagi A. Efficacy of Aloe Vera as A Pulpotomy Agent in Children Primary Teeth: Clinical and Radiographic Studies. *Journal of Gastroenterology and Hepatology Research* 2019; 8(5): 2946-2951.