

Knowledge and awareness about formocresol used in pulpotomy among dental students

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ABSTRACT

Aim: This study aims to enquire about the use of formocresol in pulpotomy and awareness about it among dental students. **Materials and Methods:** The questionnaire to know the use of formocresol in pulpotomy was e-mailed to 120 dental students out of whom only 107 responded. Data management and statistical analysis were performed using statistical software. **Results:** The results showed that 77.57% use formocresol in pulpotomy of primary teeth. Of which 63.9% used diluted concentration. Most of the dental students used 1:5 dilutions and preferred calcium hydroxide (29.9%), mineral trioxide aggregate (27.1%), and formocresol in pulpotomy (22.4%). **Conclusion:** Formocresol being cost-effective was used by many students of Saveetha Dental College. Although diluted formulations were used, the effective dose and concentration causing minimal harm are yet to be determined.

KEY WORDS: Calcium hydroxide, Formocresol, Mineral trioxide aggregate, Pulpotomy, Survey

INTRODUCTION

Pulpotomy is one of the most common treatment procedures done in pediatric dentistry. This procedure involves removal of caries from coronal pulp and restoring it with pulp-capping agent. The idea of this technique is to preserve the radicular pulp of the treated tooth until its exfoliation.^[1] Various pulp therapy agents are formaldehyde-based materials, glutaraldehyde, mineral trioxide aggregate (MTA), hemostatic medicaments, zinc oxide eugenol, bone morphogenetic proteins, collagen, and calcium hydroxide.^[2] Formocresol was first introduced by Sweet in 1930 for pulpotomy procedures.^[3] There has always been a controversy on usage of formocresol as a pulp-capping agent. It has been shown to be distributed systemically and having cytotoxic and mutagenic effects.^[4] Formocresol was also used to treat non-vital permanent teeth.^[5] Formocresol is composed of 19% formaldehyde, 35% tricresol, 15% glycerin, and 31% water base. This was found by

Buckley and hence called as Buckley's formocresol.^[6] Formaldehyde in formocresol forms bonds with amino groups of both bacterial proteins and remaining pulpal tissue and converts them into inert compounds, thereby preventing enzymatic breakdown.^[7] The study conducted by Morowa *et al.*, in 1975, was the usage of 1:5 formocresol dilutions in pulpotomy technique. This technique was gradually accepted as a gold standard technique.^[8] 1:5 dilutions are prepared by adding 30 ml of Buckley's formocresol, 90 ml of glycerol, and 30 ml of water.^[9] Formocresol pulpotomy has a long history of clinical success and this procedure has been carried out for >100 years.^[10] Diluted formocresol is the most widely recommended pulpotomy medicament and it is not available commercially.^[11] Since there were lot of controversies and limitations, formocresol was replaced by various pulp-capping agents in pulpotomy procedure.^[12] Therefore, this study was surveyed among dental students in Saveetha Dental College about formocresol and its use in pulpotomy.

MATERIALS AND METHODS

A questionnaire survey containing 10 questions enquiring about formocresol used in pulpotomy was mailed to 120 dental students of Saveetha Dental College. Survey

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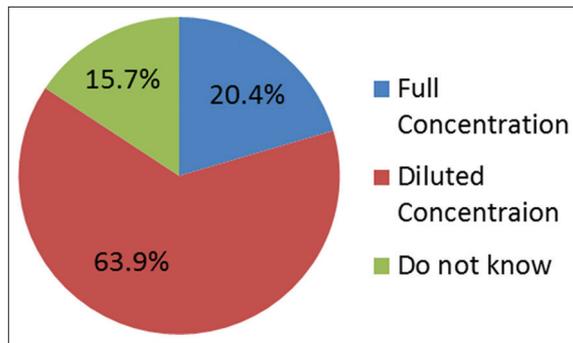


Figure 1: Concentration of formocresol used

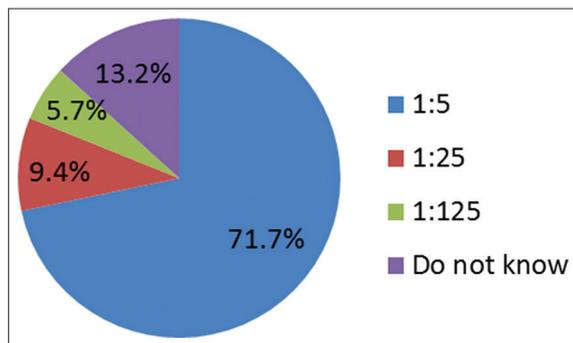


Figure 2: Formulation of diluted formocresol

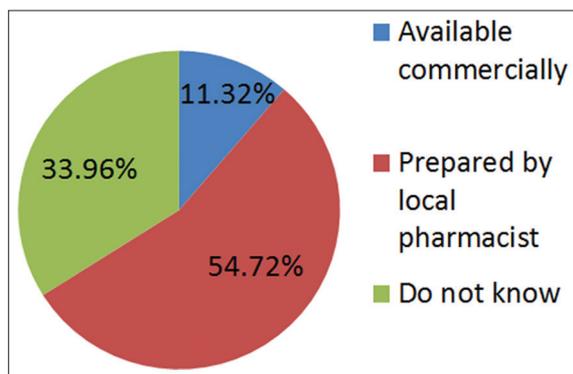


Figure 3: Availability of formocresol

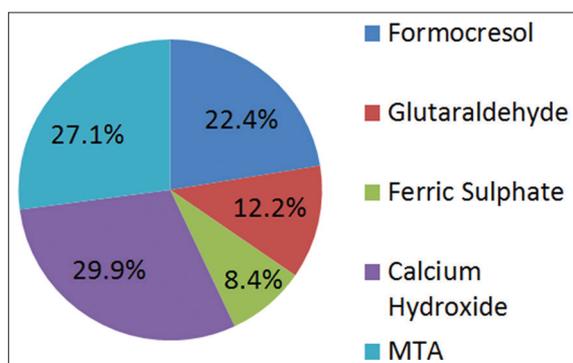


Figure 4: Preference of medicament in pulpotomy

questions were based on the use, concentration, and availability of formocresol. Responses were tabulated and statistical analysis was made.

Table 1: Year-wise representation of participants

Year of study	Frequency (%)
3 rd year	17 (15.89)
Final year	27 (25.23)
Interns	63 (58.88)

Table 2: Awareness about formocresol in pulpotomy

Questions	Response	Percentage
Are you using formocresol for routine pulp therapy in primary teeth	Yes	77.57
	No	22.43
Do you use formocresol as an intracanal medicament	Yes	47.7
	No	52.3
Do you use formocresol for pulpotomy in permanent teeth	Yes	0
	No	100
Do you know formocresol is mutagenic	Yes	84.11
	No	15.89
Do you know about the diluted formulations of formocresol	Yes	47.7
	No	52.3
Have you done any clinical trials on the use and effect of diluted formocresol	Yes	0
	No	100

RESULTS

A total of 107 questionnaires were answered. All yes or no type of questions is tabulated and multiple choice types are shown as pie charts [Tables 1 and 2].

DISCUSSION

Teeth with deep carious lesions approximating pulp are treated by pulpotomy.^[13] In this study, the responses for the questionnaires were tabulated and analyzed statistically.

In various studies, there were higher clinical success rates on using formocresol for pulpotomy. The studies conducted by Markovic *et al.* showed 82% clinical success rate and Huth *et al.* showed 87% clinical success rate,^[14,15] whereas Sonmez *et al.* reported a 67% clinical success [Table 2].^[16]

In the present study, most of the dental students were using formocresol in routine pulpotomy procedure (77.57%) and knew it was mutagenic (84.11). Only 47.7% of dental students knew about diluted formulations and none of them conducted clinical trials on use and effect of its diluted formulations, whereas the study conducted by Swati *et al.* showed that 3.3% of pediatric dentists have done clinical trials. About 63.9% used diluted formulations [Figure 1] and in those around 71.7% of them were using 1:5 formocresol dilutions [Figure 2]. The responses were similar to that of study conducted by Swati *et al.* when asked about availability of formocresol [Figure 3] and dilutions of formocresol. On comparison, the study conducted by Swati *et al.*

showed majorly formocresol 60.8% as a preferred medicament and our study showed equal preferences [Figure 4] for medicaments calcium hydroxide (29.9%), MTA (27.1%), formocresol (22.4%), glutaraldehyde (12.2%), and ferric sulfate (8.4%).

The responses to this survey indicate that there is much confusion among the dental students about the availability of the formocresol, and it is interesting that many knew about diluted formulations and its mutagenicity.

CONCLUSION

Formocresol being cost-effective is used by many of the dental students of Saveetha Dental College as medicament in pulpotomy procedure. Full-strength formocresol formulation should be avoided since it is more cytotoxic and mutagenic with greater systemic distribution of formaldehyde. Although the dental students are aware of diluted formulations, the effective dose and concentration causing minimal harm should be determined.

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