



Parental acceptability of coloured compomer as a restorative material in primary teeth of children - A randomized split mouth clinical trial

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ABSTRACT

Coloured compomer materials have been introduced in Pediatric Dentistry and gained popularity as it develops a positive behaviour in the child and makes further treatment stress-free. However, parental satisfaction regarding the appearance of coloured compomer is questionable. This study aimed to compare the parental acceptability of coloured compomer compared to conventional compomer for the restoration of primary teeth in children. A total of sixty sites, divided into two groups, with thirty subjects in each group using split-mouth design were chosen amongst patients aged between 5 to 10 years reporting to the Department of Pedodontics and Preventive Dentistry. In the control group, conventional compomer (Material A) were placed, similarly coloured compomers (Material B) were placed in the experimental group under the standard operating protocol. Parental preference was noted by asking them to tick or point to the appropriate box labelled Material A and Material B, and the results were evaluated by statistical analysis using SPSS version 21.0. A statistically significant difference was found in parents in preference of conventional tooth coloured compomer as the restorative material ($p < 0.05$). Thus, the preference of parents regarding the placement of coloured compomer in primary teeth is comparatively low. Though the coloured compomer material positively influences the behaviour and treatment outcome in children, the parental satisfaction is found to be comparatively low as parents feel that it lacks the aesthetic appeal when compared to the conventional tooth-coloured restorations.



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INTRODUCTION

Polyacid-modified resin composites, also known as called compomers, were developed as direct aesthetic restorative materials that combine both the desirable properties of light-curing composites as well as the fluoride-releasing property of glass-ionomer cement (Krämer and Frankenberger, 2007; Luo *et al.*, 2000). Since their introduction to the market in 1993, they have been indicated for the anterior and posterior restorations of primary teeth (Krejci *et al.*, 1994).

Coloured compomers have been available in the market since 2002 for use in the restoration of primary molars (Croll, 1995). In contrast to conventional polyacid-modified resin composites, a small

amount of glitter particles have been incorporated into it which produce a colour effect in shades of red, blue etc.. In contrast, the filler content is similar to that of the conventional compomers (Krämer and Frankenberger, 2007).

The two commercially available coloured compomers available in the market are MagicFil (Zenith, Englewood, N.J., USA) and Twinky Star (Voco, Cuxhaven, Germany). Twinky Star is a light-cured, coloured, radiopaque and fluoride-releasing compomer filling system which is made specifically to be used in primary teeth (Oba *et al.*, 2009). Twinky Star Flow is available in two colours: blue and pink. The flowable property of the material allows for improved wetting of the cavity floor and walls. It thereby guarantees the superior quality of the filling evenly in challenging clinical situations and to provide speedy restorations.

The positive behaviour outcome exhibited in children given the freedom of choice of the colour of the material to be placed to be convincing. However, the satisfaction of parents on appearance and outcome of the coloured compomer restoration is yet to be evaluated. There have been no previous studies done to compare conventional compomers and coloured compomers concerning parental satisfaction and acceptability. Thus this study was done comparing the parental satisfaction and acceptability between traditional compomer and coloured compomer material.

MATERIALS AND METHODS

This randomised controlled trial was conducted in the Department of Pedodontics and Preventive Dentistry from July to December 2018. The Institutional Review Board approved the trial design. The complete procedure was clearly explained, and informed consent was obtained from the parents of the children who participated in the study. The sample size was determined as 30 per group with an estimated sample size of 60 based on a previous *in vivo* study conducted with 95% probability (Hugar *et al.*, 2017).

Children between 5 to 10 years of age with bilateral occlusal caries involving enamel or dentin in mandibular primary first or second molars were included in the study. Patients with a high risk of caries (having more than four carious lesions), proximal caries in the considered teeth, patients undergoing orthodontic treatment, presence of any systemic disease and with special health care needs were excluded from the study.

In the selected 30 patients, sixty restorations were

placed, thirty teeth coloured flowable compomer restorations (Dyract Flow, Dentsply Inc.) [Figure 2] as a control group (Material/Group A) and thirty coloured flowable compomer restorations (Twinky star Flow, Voco. Cuxhaven, Germany) [Figure 1] as the experimental group (Material/Group B) in the selected patients using Computer Randomisation Software method.

Clinical procedure

The children were made to sit comfortably on the dental chair, and the procedure was entirely explained to the parents and the children.

Children were then asked to choose their preferred colour among the available colour shades (blue/pink) of the flowable coloured compomer to be placed on the allotted tooth. After rubber dam isolation of the selected teeth, fluoride-free pumice prophylaxis was done on the concerned teeth. The tooth preparation was done using high speed round diamond points according to the principle of minimally invasive dentistry to receive the restorations under the standard operating protocol. Bonding agent was placed, and light-curing was done according to the manufacturer's instructions in both the groups. Restorations were placed in horizontal layers not exceeding a thickness of 2 mm per layer to allow proper polymerisation of the material; each layer was polymerised for 40 seconds in both the groups. Occlusion was checked using articulating paper, and the restorations were polished using diamond finishing burs and discs (3M ESPE, St. Paul, Minn., USA).

After placement of both the tooth coloured and coloured compomer restorations in the respective teeth bilaterally in the oral cavity, both the parents and the children were asked separately to select one between the tooth coloured compomer and the coloured compomer placed in the two respective teeth bilaterally to indicate their restorative material of choice and tick or point on the appropriate box accordingly labelled as Material A (white) and Material B (coloured).

The data was entered into a standardised format and analysed statistically using SPSS software version 23.0. A probability value of less than 0.05 was considered significant.

RESULTS AND DISCUSSION

According to the results obtained, statistical significance was found among parents in preference of Conventional tooth coloured compomer as the restorative material ($P < 0.05$) [Table 1, Figure 3].

Thus, in the present study, it was found that the

Table 1: Distribution of preference of both children and parents regarding the preference of material placed

	Parents' preference	Children/subject's preference	p-value
Tooth coloured compomer (Material A)	20(67%)	6(20%)	<0.05*
Colored compomer (Material B)	10(33%)	24(80%)	

*p<0.05, statistically significant

Table 2: Distribution of the subject's colour/shade preference (Material B)

Colour	Girls(n=15)	Boys(n=15)	Total
Blue	4 (26.66%)	9 (60%)	13(43.33%)
Pink	11 (73.33%)	6 (40%)	17 (56.66%)

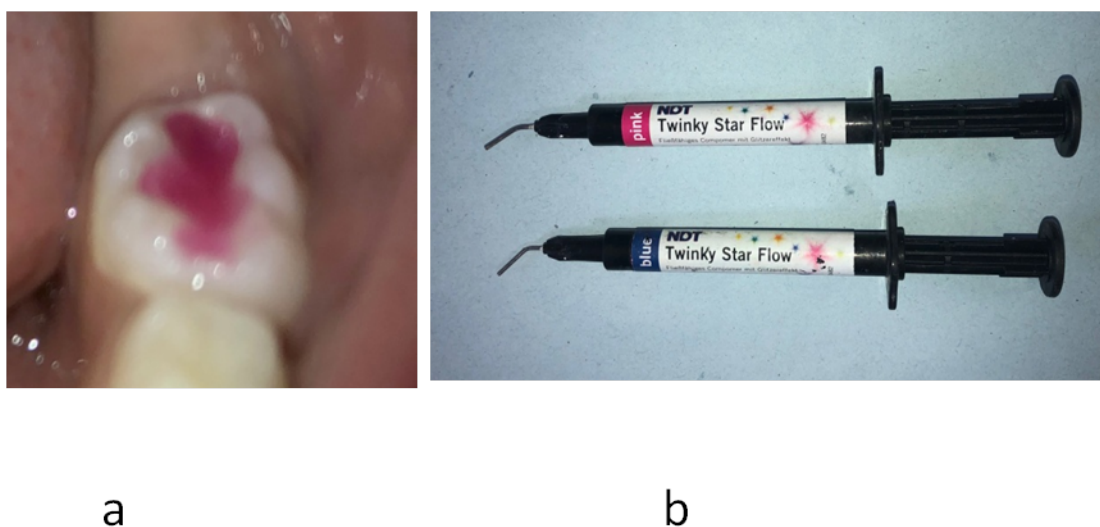


Figure 1: Coloured compomer restoration placed in the respective tooth according to the subject's preference of shade. Twinky star Flow- flowable coloured compomer restorative material used in the study

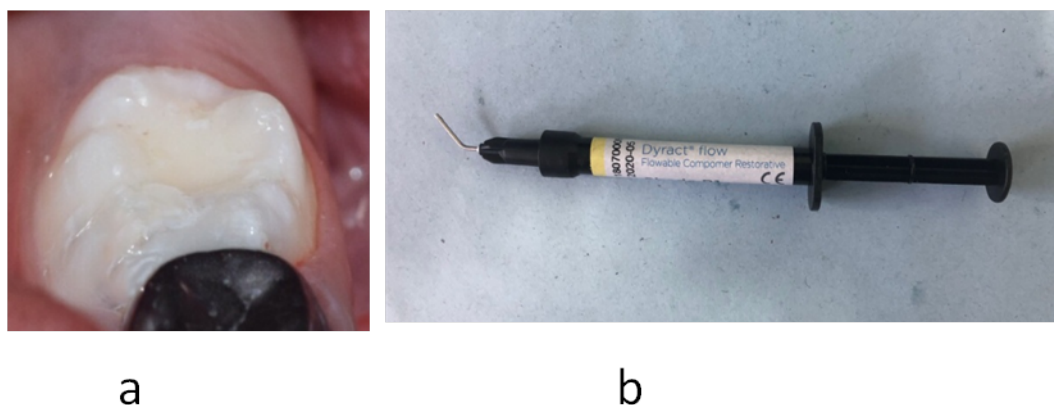


Figure 2: Tooth-coloured compomer restoration placed in the respective tooth. Dyract Flow - flowable conventional compomer restorative material used in the study.

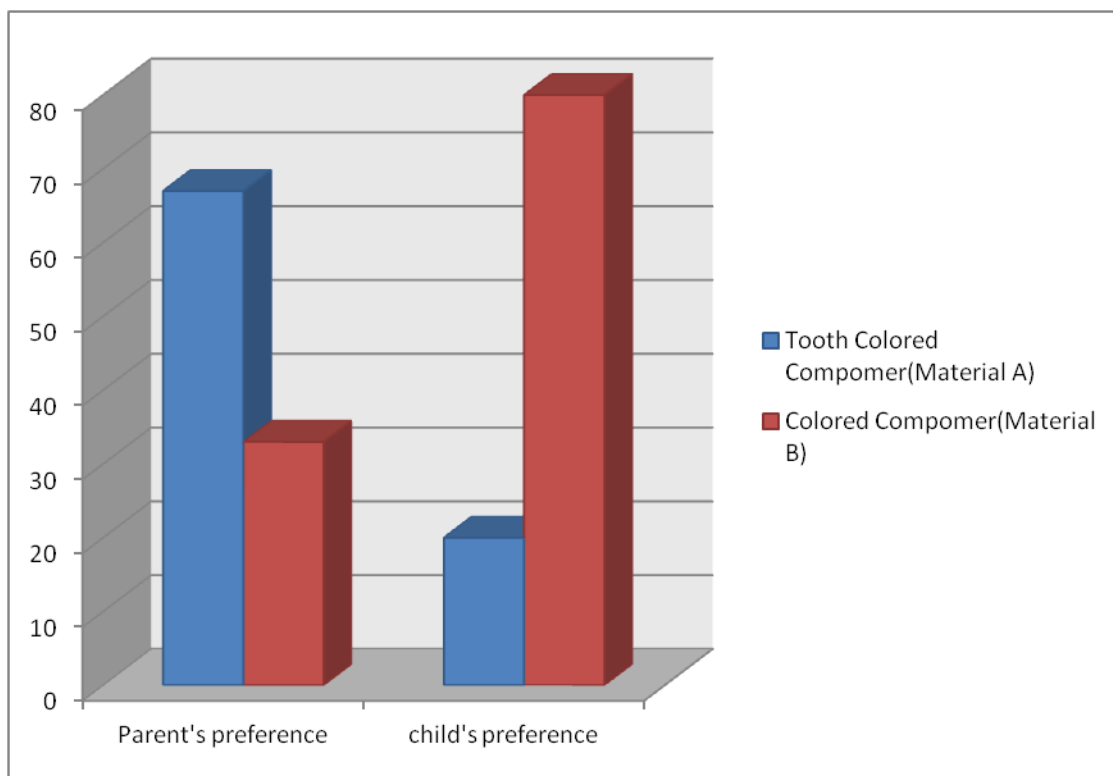


Figure 3: Percentage of preference of both children and parents regarding the preference of material placed

preference of parents regarding the placement of coloured compomer in primary teeth is comparatively low. Among the selection of the shade of the coloured compomer in children, 56.66% chose the pink shade, and 43.33% chose a blue shade as their preferred shade in Group/Material B [Table 2].

In the recent years, an inclination in the general preference was noted towards alternatives to amalgam mainly due to the increasing concern regarding its toxicity and preference for improved esthetics (García-Godoy, 2000; Hes *et al.*, 1999). Taking this into consideration, several tooth-coloured materials such as glass ionomer cement, resin-modified glass ionomer cement, polyacid-modified resin composites and resin composites have been introduced for the restoration of primary teeth (Berg, 1998; Fleming *et al.*, 2001; Duggal *et al.*, 2002).

Polyacid-modified resin composites have been introduced as conservative restorative materials for primary teeth based on the results of previous clinical trials (Krämer and Frankenberger, 2007; Luo *et al.*, 2000; Croll, 1995). They have certain credible features such as low relative thermal conductivity, preservation of dental structure in cavity preparation, continuous progress in their composition stability, durability, fluoride release, and has gained popularity because of the rising

demand from parents to provide better esthetic restorations for their children. Following this, in the year 2002, a new coloured compomer material was introduced to the market. This material is available in attractive colours which makes it an acceptable restorative material for children.

Several clinical studies have concluded that commercially available compomers are found to exhibit high clinical success rates which are comparable to that of amalgam, and thereby making them a suitable alternative to amalgam for the restoration of primary teeth in children (Kavvadia *et al.*, 2004; Duggal *et al.*, 2002). Since both boys and girls alike will be enthusiastic about choosing their favourite colour, these children would develop the feeling that they could actively influence the treatment procedure as they have the freedom of selecting the colour for themselves. This, in turn, lowers the fear and impatience and develops a positive attitude in the child, thus making further treatment procedures stress-free. Moreover, they will develop a lasting interest in taking care of their teeth so that the newly placed coloured fillings remain attractive as long as possible.

However, no study has been done evaluating the preference and the acceptability of parents regarding the placement of coloured restorative material in children. Thus, this study was done compar-

ing the preference of parents between conventional tooth coloured flowable compomer(Dyract Flow, Dentsply Inc.) and newly introduced coloured flowable compomer(Twinky Star Flow Voco. Cuxhaven, Germany). It showed a statistically significant difference among parents in favour of conventional compomer when compared to coloured compomer. Though the parents well appreciated a positive attitude of the children during the procedure, it lacks the aesthetic appeal among parents who tend to prefer a more natural and aesthetic outlook with regard to the restorations.

Limitations

The small sample size was taken into consideration for the study. Future studies with larger sample size can be undertaken in this aspect.

CONCLUSIONS

The coloured compomer material despite its credible mechanical properties and positive behaviour outcome, it fails to produce the aesthetic appeal regarding parental satisfaction, as parents tend to prefer the conventional tooth colour as it is more aesthetic and natural-looking compared to the coloured compomer material used in our study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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