

Clinician's Choices of Restorative Materials for Children: A Questionnaire Based Study

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ABSTRACT

Background: Wide range of restorative material available for restoration of primary as well as young permanent tooth in children. The dentist's choice varies according to the tooth restored.

Aims: To come across the more desirable material of dentist for the restoration of primary as well as permanent dentition in children and also to find out the management of deep carious lesion.

Materials and method: A self-administered questionnaire was given to 80 general practitioners in various dental clinics in Kannur District. Out of these 50 questionnaires were considered. The collected data were tabulated and analysed.

Results: Out of 50 questionnaires GIC was selected by 72% dentist for primary class 1 lesion and 42% for primary class 2 lesions. Prime important was given for silver amalgam in permanent Class 1 (46%) as well as Class 2 (60%) lesion. 48% practitioner selected composite for primary anteriors and 88% for permanent anteriors. 54% chosen ZnE for management of deep carious lesion without pulp exposure and Ca(OH)₂+ZnE for pulp exposure in primary teeth. Only 22% dentists were using pit and fissure sealant in their daily practice.

Conclusion: GICs are the clinician's first choice to restore occlusal as well as proximal carious lesion in primary posterior teeth. Amalgam is still a choice of restoration of occlusal as well proximal carious lesion in permanent posterior teeth.

Keywords: Pedodontics, restorative materials, children.

INTRODUCTION

Restoration of carious primary tooth is important for maintaining normal architecture of tooth as it helps in physiologic development of permanent dentition & also for the normal psychological development of child.^{1, 2} Now a days, a plethora of restorative materials including amalgam and stainless steel crowns, improved conventional glass ionomer cements and composite resins, resin-modified glass ionomer cements and

polyacrylic acid modified composites (compomers) have easily available.

Throughout the world amalgam was the restorative material of choice for primary as well as permanent posterior teeth. But because of various research regarding the toxicity of mercury, environmental hazard and also its poor esthetic nature there is a decline in the use of amalgam for restoration of carious tooth in children.^{2, 3} But still

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some are using amalgam for class II restoration of permanent tooth.

Conventional glass ionomer cement is a commonly used restorative material in children. It is biocompatible, adhesive, esthetic and has anticarious property with favourable thermal expansion and contraction.^{4, 5} Composite resin is the most esthetic material with good adhesive and wear properties and also command set. In paediatric dentistry, a highly-filled composite resin is recommended for preventive resin restorations, Class I and II restorations not extending beyond the line angles, and anterior restorations.⁵ Compomers are recommended for paediatric dentistry as they exhibit properties similar to composite resin and release fluoride (but less than released by glass Ionomer Cement). Its use is advised only in patients with low-to-moderate caries risk, and should be monitored for secondary caries and wear. Favourable clinical performance and low failure rate have been reported over two to three years for one compomer, suggesting it is an 'amalgam alternative' in Class II restorations in primary teeth.⁶

The aim of the present study was to find out the more desirable material of dentist for the restoration primary as well as permanent dentition in children and also to find out the management of deep carious lesion.

MATERIALS AND METHOD

A self-administered questionnaire was given to 80 general practitioners in various dental clinics in Kannur District. A fourteen item questionnaires were chosen to find out the choice of materials of dentist to restore tooth in children in different clinical scenario. The questionnaire was distributed to these dentists manually and also by email. The collected datas were analysed and tabulated in Microsoft excel software. When obtaining the numerical representation by percentage, the total no of answers for each query was taken into account.

RESULTS

Out of 80 practitioners, 58 questionnaires were returned, 8 returned questionnaires were not taken into account because of the incomplete lack of

data. Therefore 50 questionnaires were considered for this study. 36(72%) selected glass ionomer cement as the most commonly used restorative material for primary class 1 carious teeth followed by miracle mix 12(24%) and silver amalgam 2(4%) (fig 1) whereas for class 2 lesion 21(42%) dentist selected GIC, followed by miracle mix 16(32%) stainless steel crown 6(12%), silver amalgam 4(8%), composite 3(6%) (fig 2). For class 1 lesion of permanent teeth 23(46%) selected silver amalgam followed by composite 15(30%), GIC 8(16%) and miracle mix 4(8%) (fig 1) and for class 2 lesion silver amalgam was chosen by 30(60%) followed by composite 14(28%), GIC 2(4%), miracle mix 2(4%) and stainless steel crown 1(2%) (fig 2).

Factors considered to be most important for selection of restoration primary posterior teeth are recurrent caries prevention 24(48%), shape and size of cavity 9(18%), site of caries 5(10%) and moisture control by 3(6%) dentist. And for permanent posterior teeth in children 18(36%) selected durability, retention, resistance, 17(34%) choose shape and size of cavity 10(20%) were behind recurrent caries prevention, 4(8%) site of caries and 1(2%) were selected material colour (fig 3).

The material of choice for restoration of primary anterior teeth in children was composite for 24(48%) of respondents GIC was chosen by 17(34%) crown 6(12%) and compomer 3(6%). For permanent anterior teeth composite was chosen by 44(88%) followed by crown 5(10%) and compomer 1(2%) (fig 4).

Patient cooperation was the factor for selection primary anterior restorative material by 30(60%) respondents followed by esthetics 12(24%), retention, strength and durability 5(10%) and ease of manipulation 1(2%). Whereas for permanent anterior teeth esthetic was considered to be most important factor by 45(90%) dentist followed by retention, strength, durability 5(10%) (fig 5).

Zinc oxide eugenol (ZOE) was the material of choice for primary tooth with deep caries without pulp exposure in children for 27(54%) dentist. ZOE with Ca(OH) was chosen by 21(42%) and GIC was preferred by 2(4%). (fig 6)

Fig 1: Restorative material for primary and permanent class 1 lesion.

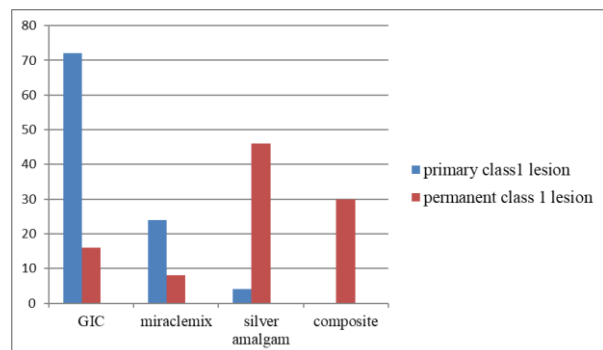


Fig 2: Restorative material for primary and permanent class 2 lesion.

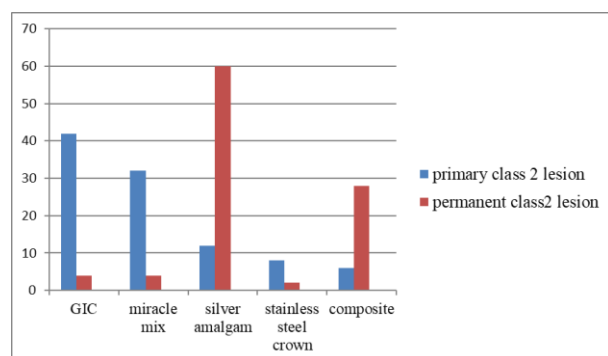
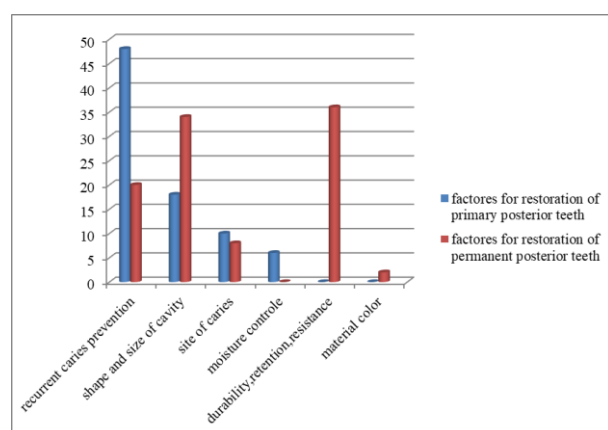


Fig 3: Factors for restoration of primary and permanent posterior teeth.



For mechanical exposure of pulp Ca(OH)+ZOE was the material of choice for 27(54%) ,ZOE for 17(34%) and 6(12%) used pulpotomy procedure(fig 6)

Material of choice for non-cavitated incipient carious lesion in primary teeth was pit and fissure sealant by 6(12%), fluoride application was chosen by 14(28%),no treatment advised by

Fig 4: Restorative material for primary and permanent anteriors.

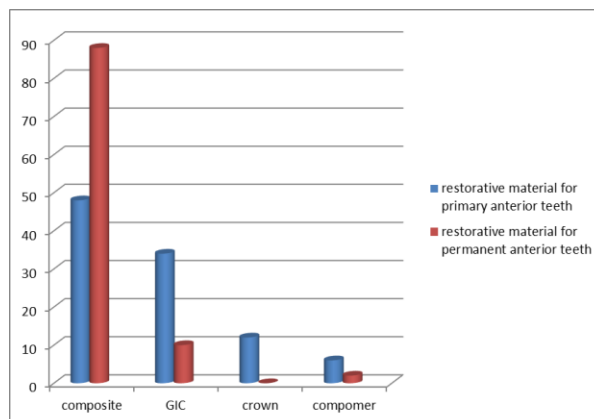


Fig 5: Factors for selection of primary and permanent anteriors.

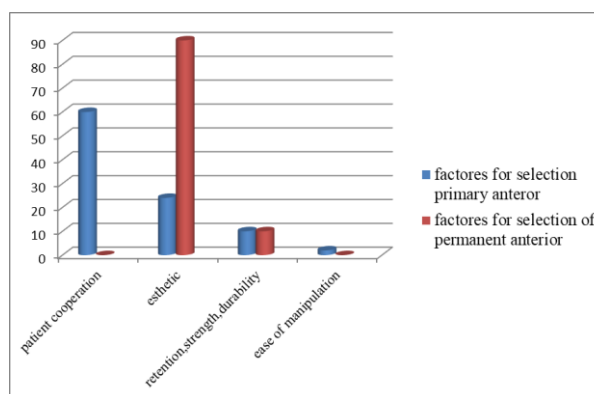
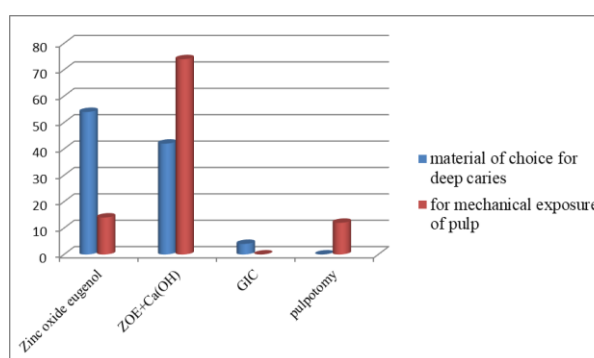


Fig 6: Material for deep carious teeth and teeth with mechanical exposure of pulp.



23(48%),tooth mousse by 4(8%) and two dentist (4%)were using GIC (fig7)

11(22%) were using pit and fissure sealant application in their daily practices, while 39(78%) dentist not using routinely (fig 8).

Fig 7: Material for non cavitated incipient lesion.

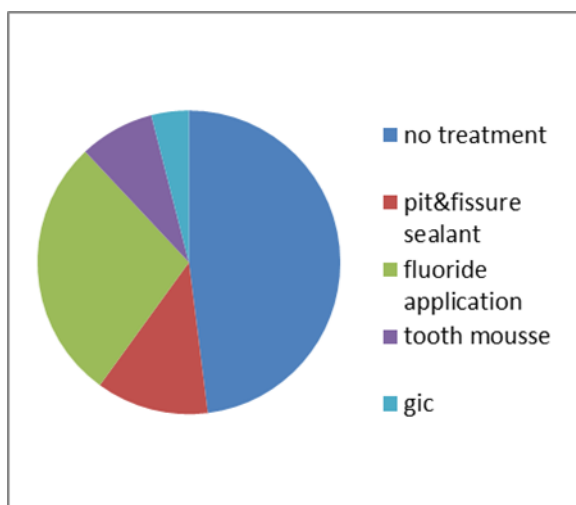
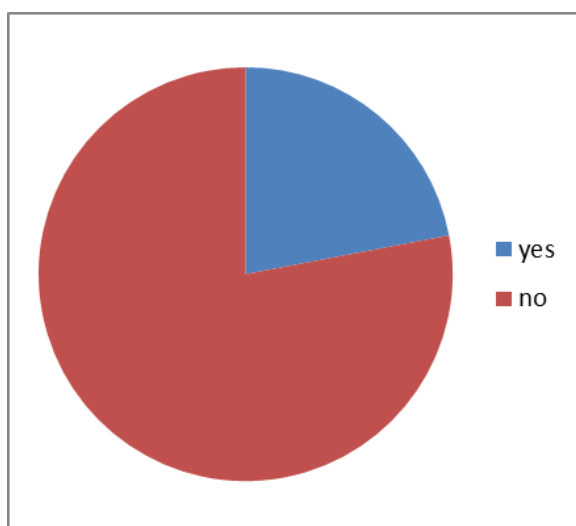


Fig 8: Pit & fissure sealant application.



DISCUSSION

The result of this study shows that GIC was the most commonly used restorative material for the restoration of primary posterior teeth in children. Silver amalgam is the most widely used restorative material for permanent posterior teeth. More than half of respondents using GIC as the material of choice for primary posterior teeth. This is similar to study by Togoo AR and WidstormFH.^{2,7} GICs have several properties that makes them favourable for use in children include chemical bonding to both enamel and dentin, thermal expansion similar to that of tooth structure, biocompatibility, uptake and release of fluoride and decrease moisture sensitivity compared to resin.⁸

Majority of respondent selected recurrent caries prevention as the factor for selection of material for restoration of primary posterior teeth. This may be because of ample fluoride release and longevity reported with GIC.⁹ It is concluded that durability, retention, resistance and shape and size of the cavity were the most commonly used factors for selection of permanent posterior teeth.

For restoration of primary as well as permanent anteriors composite was the first choice of restorative material. This selection indicates that the changing trends towards the esthetic material especially for primary tooth. But esthetic restoration of primary anterior teeth can be challenging due to small size of the teeth, close proximity of pulp, thin enamel, lack of surface area for bonding and issue related to child behaviour.¹⁰

The results found that about half of the dentist preferred amalgam as the restorative material of choice for proximal carious lesion in permanent teeth as it is durable and has high compressive strength, while GIC was most commonly used material for proximal lesion of primary posteriors and this finding is same as that with Zakirulla Meer and Rafi.A.Togoo.²

This study shows that half of respondents using ZOE as indirect pulp capping material in primary teeth while nearly half are using calcium hydroxide with ZOE. Majority of respondents uses calcium hydroxide as direct pulp capping agent if there any mechanical exposure occur in primary teeth. DPC use in primary tooth is a controversial treatment and it is not recommended by American Academy of Paediatric Dentist.¹⁰ Study by Fuks et al reported that undifferentiated mesenchymal cells in the pulp of primary teeth differentiated into odontoclast leading to internal resorption.¹¹

CONCLUSION

GICs are the clinician's first choice to restore occlusal as well as proximal carious lesion in primary posterior teeth. Amalgam is still a choice of restoration of occlusal as well proximal carious lesion in permanent posterior teeth. The study is a questionnaire based survey with less number of samples, need longitudinal studies to follow actual clinical outcome of the material.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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