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Management of dental caries in primary Anterior teeth: A dentist's perspective in purba medinipur district west Bangal

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Introduction:

Pediatric dentistry is a branch of dentistry that deals with the dentition of children and adolescents. Pediatric dentists (PDs) promote the dental health of children in such a manner which helps to build a positive dental attitude in children as well as to build awareness and educational purposes among parents. Children and toddlers often develop dental caries in anterior teeth due to poor maintenance of oral hygiene which leads to pulpal involvement and pulpitis [1]. Though there are modern technologies to prevent dental caries and increased awareness among parents to maintain the primary teeth but still there are loss of teeth prematurely among children. The main goal of primary teeth preservation is to maintain a proper arch length and form till the permanent successor erupts, thereby preventing malocclusion [2]. The most common condition of decayed primary anterior teeth are present as nursing bottle caries seen in children [3]. The treatment modalities available for management of dental caries in primary anterior teeth are placement of resin (strip) crowns, prefabricated veneered steel crowns, steel crowns, open faced steel crowns and zirconia crowns [4].Now, esthetic rehabilitation of cariously decayed primary anterior teeth is a challenging task as the clinician has to deal with the child's non-cooperation and temperament. It is very hard to presume that the child will be most cooperative at the dental clinic as they are in their very young age and still developing cognitive skills. For this reason, many practitioner and clinicians usually prefer extraction of primary teeth [5]. Knowing the importance of primary teeth in maintaining the proper arch length and as it is the best natural space maintainer, clinicians have to keep primary teeth free from any kind of infection if infected [6].Many studies and surveys are been investigated to assess the attitude and clinicians perspective in countries such as United kingdom, USA,

European countries and also Gulf countries such as Saudi Arabia [7-9]. Although, there are very few Indian studies on the same [10]. But all these studies were done on management of dental caries in primary posterior teeth whereas studies on management of dental caries in primary anterior teeth are very less [11].In the present scenario, there is no growing consensus among the GDs, PDs and dentists in other specialities on the optimal treatment of cariously involved primary anterior teeth, the present study was undertaken to aid GDs, PDs and dentists in other specialities in successfully deciding to extract or to maintain the primary anterior teeth. Hence, the aim of the present study was to assess the knowledge and attitudes towards the management of dental caries in primary anterior teeth among all dentists in Purba Medinipur district, west Bengal, India.

Methods

A cross-sectional, questionnaire survey was conducted among GDs, PDs and dentists in other specialities in Purba Medinipur district for a period of 2 months. Ethical clearance was obtained from the institutional ethical committee of Haldia Institute of Dental Sciences and Research under West Bengal University of Health Sciences, Kolkata, India. A closed-ended, structured 10-item multiple-choice questionnaire was formulated in English for evaluating the knowledge and attitudes towards management of dental caries in primary anterior teeth was constructed after prior validation. Then the questionnaires were mailed to PDs, GDs, and dentists of other specialties. They were asked to select the most suitable treatment plan from the available choices which they perform in their clinics. The identity of the participating dentists was kept strictly confidential, and participation was voluntary. The responses were collected and analysed statistically.

Results

A total of 55 survey questionnaires were distributed. Among them 48 questionnaires were filled and returned with the response rate of 87.27%. Of the total survey respondents, 24 (50%) were graduate dentists (BDS) or general dentists, 5 (10.41%) were GDs with training in any short course related to pediatric dentistry, 6 (12.5%) were PDs and 13 (27.08%) were dentists from other specialties as well as their work profile was also recorded (table 1A and 1B). 15 (31.25%) clinicians responded that very often the parents ask for esthetic rehabilitation of cariously involved primary teeth whereas 7 (14.58%) clinicians responded that parents never ask for esthetic rehabilitation (table 1C). The choice of restorative materials commonly preferred by the clinicians to restore cariously involved vital anterior primary teeth are glass ionomer cement (29.16%), pediatric strip crown (16.66%) and some clinicians also extract the tooth (18.75%) (table 2A). For cariously involved non- vital primary anterior teeth most clinicians follow wait and watch and 10.41% of clinicians refer patients to pediatric dentist (table 2B).After pulp therapy most of the clinicians (43.75%) prefer GIC restorations whereas very less clinicians (4.16%) follow zirconia crowns (table 3A). Other treatment modalities preferred by clinicians are strip crowns (22.91%), custom post and core (12.5%), preveneered crowns (10.41%) and sometimes any other restorations like silver amalgam (6.25%). Many of the clinicians (70.83%) do not support the use of zirconia crowns in pediatric dentistry because of its cost (67.64%) (table 3B and 3C). Nearly 52.08% clinicians follow fluoride therapy after placement of crowns or restoration whereas 37.5% clinicians did not follow the protocol of fluoride application (table 4A). When the clinicians were asked about the interval they followed for fluoride application most of them (68%) only prescribe a fluoride

toothpaste and they did not follow any professionally applied fluoride therapy (table 4B).

Table 1: work profile of clinicians

VARIABLE	Frequency (n= 48)	%
1A. Work profile of clinicians		
Graduates	24	50
Graduate with training with any short course related to pediatric dentistry	5	10.41
Post- graduate in pediatric dentistry	6	12.5
Post- graduate in other speciality	13	27.08
1B.Number of child patient visited every week		
Less than 5	22	45.83
5-10 patients	15	31.25
10-20 patients	6	12.5
More than 20 patients	5	10.41
1C.How often the parents ask for esthetic rehabilitation of their children's primary teeth?		
Very often	15	31.25
sometimes	16	33.33
Very few	10	20.83
never	7	14.58

Table 2: Choice of therapy preferred by clinicians for cariously involved primary anterior teeth

Options	Frequency (n= 48)	%
2A. Treatment modality clinicians usually prefers for restoring cariously involved vital primary anterior teeth		
GIC	14	29.16
Composite resin	6	12.5
Preventive treatment like fluoride	4	8.33
Pediatric strip crown	8	16.66
Extraction	9	18.75
Any other	7	14.58
2B. Treatment modality clinicians usually prefers for restoring cariously involved non- vital primary anterior teeth		
Medications	7	14.58
Wait and watch	10	20.83
Extraction	9	18.75
Pulp therapy with crown restoration	8	16.66
Refer to pediatric dentist	5	10.41
Refer to other specialist	9	18.75

Table 3: Choice of crowns preferred by clinicians after pulp therapy

Options	Frequency (n= 48)	%
3A. Treatment choice of clinicians for restoring primary anterior teeth after pulp therapy		
GIC restoration	21	43.75
Strip crown	11	22.91
Custom post and core	6	12.5
Preveneered crown	5	10.41
Zirconia	2	4.16
Any other crown	0	0
Any other restoration	3	6.25
3B.If the clinicians support the use of zirconia crowns in pediatric dentistry		
Yes	14	29.16
No	34	70.83
3C. If no, what is the reason? (n= 34)		
Expensive	23	67.64
It causes trauma to gingiva	2	5.88
It requires more tooth reduction	5	14.70
No long term studies and data available of success rate	4	11.76

Table 4: Post- restorative fluoride therapy

Options	Frequency (n= 48)	%
4A.If the clinicians follow fluoride therapy following placement of crown or restoration		
Yes	25	52.08
No	18	37.5
Sometimes	5	10.41
4B.If yes, what is the interval do clinicians follow? (n= 25)		
Once in a year	3	12

Once in every 6 months	5	20
By prescribing fluoride toothpaste	17	68

Discussion

Various factors are involved in decaying of primary and permanent teeth. Although treatment modalities varies for primary posterior and anterior teeth, a variety of esthetic restorative materials are available for restoring primary anterior teeth. Knowledge of the specific strengths, weakness, and properties of each individual material will enhance the clinician's ability to make the best choice of selection depending on the cariously involved tooth. Treatment of primary anterior teeth in 18-36 months old children is quite challenging for clinicians due to their uncooperative behaviour [3]. Although the clinicians are willing to perform restorations many parents are not willing as they are not aware of esthetic rehabilitation of their children's primary anterior teeth due to treatment cost and lower socioeconomic status [12]. There is very limited information on the potential psychological impact of anterior caries or any type of unesthetic restoration in cases of primary teeth. Optimal esthetics should clearly be the main treatment goal for a clinician whenever possible [13].According to various literature, generally available crowns are preveneered stainless steel crowns, zirconia crowns, strip crowns various others cemented and bonded crowns for restoring primary anterior teeth [14]. In our study, most clinicians preferred glass ionomer restorations (29.16%) over extractions (18.75%) (table 2A) and very few clinicians mostly pediatric dentists prefer strip crown which is the ideal treatment for cariously involved vital primary anterior teeth. In case of non- vital primary anterior teeth which can be restored the ideal treatment should be endodontic treatment followed by placement of crowns but most of the clinicians prefer medication (14.58%), wait and watch (20.83%), extraction of the tooth (18.75%) whereas very few clinicians especially prdiatric dentists go for pulp therapy (16.66%) and 10.41% of clinicians refer pediatric dental patients to pediatric dentists (table 2B). According to Cochrene review on dental fillings for the treatment of caries in the primary dentition there is no such study found which compared restorations versus extractions or no treatment as an intervention procedure in children with dental caries [15].An ideal anterior restorative material should be easy to place, durable, esthetically pleasing and inexpensive. There are several available options to provide full coverage restorations for anterior primary teeth, each having its own advantages, disadvantages and also associated technical, functional or esthetic limitations [16]. For decades, stainless steel crowns have been considered the most durable of all restorations in primary anterior teeth outperforming silver amalgam and direct composites as well as glass ionomer restorations which is not esthetically pleasing for anterior teeth [17].Zirconia crowns are also called 'ceramic steel' as it provides tooth like esthetics and strength close to metal crowns used in dentistry for restoring permanent teeth as well as primary teeth. These crowns can provide more strength in less volume are thermostable with low heat conductivity also it has low thermal expansion and stable chemical resistance thus making it extremely biocompatible material [18].In our study, most clinicians (43.75%) preferred glass ionomer restorations which is most unesthetic material and only 4.16% clinicians prefer zirconia crowns for primary anterior teeth restoration. When they were asked if they supported the use of zirconia crown in pediatric dentistry mostly (70.83%) gave negative response. The reason behind it is much expensive (67.64%) than any other materials available in market. The other reasons are

that it causes trauma to gingiva and sometimes it needs more tooth reduction than placing another type of crown [19]. Another reason might be that there is no long term clinical data available for the success rate of zirconia crowns for primary anterior teeth for which 11.76% clinicians don't prefer zirconia crowns. Relatively less use of various types of crowns for children may be lack of experience among the GDs. GIC may have been used for its easy manipulative properties and easy availability in market. There are not sufficient clinical data available which compares longevity of various restorative materials or esthetic crowns in pediatric dentistry.Fluoride has been a major factor in the prevention of dental caries. Professionally-applied topical fluoride treatments are effective in reducing prevalence of dental caries [20]. Although in our study, 12% clinicians follow fluoride therapy once a year, 20% clinicians follow fluoride therapy twice a year and majority of the clinicians (68%) followed fluoride therapy by prescribing fluoridated toothpaste only. According to Weyant RJ, Tracy SL, Anselmo T, et al [21] biannual application of professionally applied fluoride is most effective in prevention of dental caries in children.From this study we can see that pediatric dentists render treatment as well as preventive therapy like fluoride application of decayed primary teeth. Technological advancements such as zirconia crowns are taking place and the attitudes of dental clinicians toward such treatments is also changing. Although most of the general dentists and specialized dentists are keeping abreast with the latest developments as well as conventional treatments in pediatric dentistry, still those dentists should undergo some training in pediatric dental procedure for esthetic rehabilitation of primary anterior teeth.

Conclusion

From this study, it can be concluded that GD and dentists of other specialties are not genuinely aware about esthetics procedures for primary anterior teeth in pediatric dentistry and still most of them need to be educated about the importance of primary anterior teeth and the advantages in keeping the primary teeth in place till permanent teeth erupt.

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