Management of Early Childhood Caries – a comparison of different approaches

Bathsheba J Turton[1]
Callum S Durward[2]

[1]Lecturer Department of Dentistry University of Puthisastra
[2]Dean Faculty of Health Sciences University of Puthisastra

Abstract

Early childhood caries (ECC) is a major problem in the South East Asian (SEA) region. The management of ECC in preschool children is multi-faceted and can be challenging for the child, the dental team, and the family. There is only limited evidence for the use of specific techniques in the management of ECC. The objective of this paper is to review different treatment approaches in the management of ECC. Method: a critical review of the literature was conducted in order to examine evidence for the best techniques to manage ECC. Results: three treatment approaches were examined (1) the 'no treatment' approach, (2) the 'minimally invasive dentistry' (MID) approach, and (3) the 'conventional' approach. Treatment of carious lesions in the primary dentition is well-justified and results in improvements in Quality-of-Life. Recommendations for conventional treatment techniques vary widely and often require general anaesthetic to be predictable for preschool children who may have difficulty accepting treatment. The minimally invasive approach appears to be promising and centres around the use of Atraumatic Restorative Technique (ART), Arrest of Caries Treatment (ACT) with silver diamine fluoride, and the Hall crown technique. Early intervention to treat early lesions and prevent caries is very important. It can be concluded that the Minimally Invasive Dentistry (MID) approach to managing ECC appears to be the most appropriate public health approach for managing ECC in the SEA region. It would be beneficial to build more evidence around this approach in order to inform the practice of caries management in preschool children.

Keywords

Early childhood caries, ECC, Primary dentition, Management of Early Childhood Caries, Review of Early Childhood Caries

Introduction

Early Childhood Caries (ECC) is highly prevalent in many South East Asian countries. Just as the presentation and socio-behavioural aspects of ECC differ somewhat from caries found in older children, the management of ECC can also differ. This is partly related to the child's stage of cognitive, physical, psychosocial and dental development.[1] When treating young children, their stage of development, the context of their families, and the social environment are of utmost importance.[1-3] Behaviour management can be a considerable challenge.[1] In addition, the restorative and endodontic techniques used in the adult dentition may not always be appropriate in primary teeth, which are anatomically different and in the mouth for a limited period of time. Primary teeth are smaller, have thinner enamel and dentine, have a more bulbous crown shape, and often have complicated root canal systems.[4]

These factors may have contributed to some ambiguity in terms of defining the ideal dental treatment in preschool children.[5] In addition to this, there is some ambiguity in defining the management of dental caries which may be broadly categorised into primary prevention which addresses the control of risk factors, secondary prevention which addresses the non-cavitated lesions by preventing their progression to cavitation, and tertiary prevention which addresses cavitated lesions thereby preventing pulp problems and risk of need for extraction. Primary prevention is dealt with in another paper within this supplement and so this paper is mainly focused on secondary and tertiary prevention.[6] Around the latter two phases of caries management, there is a lack of robust research about the best techniques to use for preschool children, and some hesitation about how dentists should manage preschool children in the dental clinic.[7] The aim of this article is to describe three different approaches to the management of ECC: the 'No Treatment' approach, the 'Minimally Invasive Dentistry' (MID) approach, and the 'Conventional' approach.

Method

Literature to inform this review of aspects of Early Childhood Caries was obtained in several ways. First, an electronic internet search was made through PubMed and ScienceDirect databases. The primary search term was 'early childhood caries'. Other keywords included tooth decay in young children, dental caries in young children, nursing caries. Other associated terms used in the search included: diagnosis, criteria, epidemiology, prevalence, aetiology, risk factor, prevention, treatment and oral health related quality of life. Eligible studies were included when they met the following criteria: (1) articles in English providing relevant information within the time period 1990 to 2015; (2) presenting evidence relevant to ECC according to the defined themes: epidemiology, aetiology, prevention and treatment; (3) considers dental caries or sequelae in early childhood. Concerning the exclusion criteria, studies were excluded from the review if they focused on either: (1) concerned with other age-groups or other diseases, (2) studies published in languages other than English. A total of 417 articles were identified through database searching; duplicates and references irrelevant to ECC were removed, reducing this list by about one third. Two conference books relevant to the situation in Asian countries were also included.

Second, nine journals were searched by hand: International Journal of Paediatric Dentistry, European Journal of Paediatric Dentistry, Pediatric Dentistry, Journal of Dentistry for Children, Journal Clinical Pediatric Dentistry, Community Dentistry Oral Epidemiology, Community Dental Health, Caries Research, Journal of Public Health Dentistry. How far back the hand-searches were made, depended on the journal: for most journals it covered 2000 to 2015,

while for International Journal of Paediatric Dentistry, the search extended back to 1990.

Third, some back-tracking from the reference lists attached to publications so far discovered was carried out to identify any remaining key articles. This resulted in a database of 380 references on all aspects of ECC, covering the years 1993 to 2016. Out of this database, 89 publications were relevant to this review of the management of ECC.

The 'No Treatment' approach

Some researchers have argued that most young children do not actually experience much pain from decayed primary teeth and that "less intervention is better".[7] These authors argue that carious primary teeth often exfoliate without pain, and that there is a lack of robust research justifying conventional treatment modalities.[8] From the perspective of reducing exposure of children to upsetting dental interventions, and saving resources, the idea of not having to treat primary teeth is an attractive one. In resource-poor communities and in developing countries, this approach to dental caries in the primary teeth has considerable appeal, as it would eliminate the burden of treatment costs borne by the parents or the public health system. Even in wealthier countries, the high cost of treating many of these young children (especially those who are treated under general anaesthesia) is a growing concern.[9-11]

The argument for "no treatment of primary teeth" assumes (i) that pain is the only measured outcome validating treatment of deciduous teeth, and (ii) that pain is expressed the same way in young children as it is in adults. However, studies have shown that pain frequently is present in children with ECC.[11,13] For a young child with a severe burden of dental caries, pain can be a daily experience and accepted as "normal"; their experience of pain may not be articulated in words but rather by changes in behaviour, including changes in eating patterns.[14] For many children, the diagnosis of ECC is only made when they articulate their experience of pain, at which stage extraction or pulp treatment may be required.[15] The carious teeth most likely to cause symptoms are the primary molars with pulpal symptoms by the age of 3 years.[16]

The suggestion that primary teeth do not need treatment also fails to take into account several studies suggesting that Severe Early Childhood Caries (sECC) of primary teeth may be associated with dietary changes leading to a lower weight gain.[12, 17-19] In addition, approximal lesions and the premature loss of decayed primary teeth due to extraction, may result in space loss and subsequent crowding in the permanent dentition.[19-20] There may also be social consequences for the child who has an aesthetically-poor appearance due to dental caries.[17, 19, 21] Other researchers have pointed to the importance of primary teeth for speech development, oral function (eating), and normal growth and development.[14] Based on this rationale, active management of carious lesions in preschool children is warranted. The justifications for active management of carious lesions are presented in Table 1.

Minimally invasive approaches

Mejàre et al.[8] suggested that standard treatment guidelines for this unique group (preschoolers) need to be modified to give dentists more confidence when treating young children and to achieve better management of the caries process. Recent research has begun to build evidence for such an approach in preschool children.[22]The concept of Minimally Invasive Dentistry (MID) has been promoted for both adults and children in recent decades. Whereas treatment of dental caries has traditionally focused on the management of cavitated lesions, the MID approach seeks to manage cavitated lesions but, in addition, promotes the management of early lesions, which present in preschool children as white spots.

Table 1 – Justifications for the management of ECC

Prevention and management of pain and infection
Improved growth and development
Aesthetics and social well-being
Avoidance of space loss
Oral function and speech development
Reducing negative impacts on children, families, dental providers and the public health system

The focus of MID is to manage the caries process, rather than just the lesion. When considering the caries process, it is important to place treatment in the context of the 'caries balance' between protective and pathological factors. Protective factors include sufficient saliva, fluoride, sealants, antibacterials, a healthy diet, and good oral hygiene. The pathological factors include high sugar diets, cariogenic bacteria and absence of saliva.[22,24] Clinicians must recognize and manage early non-cavitated lesions, and tip the balance towards the protective factors, while reducing exposure to the pathological factors.

The MID approach for non-cavitated lesions

The management of non-cavitated lesions is considered to be non-invasive treatment which aims to constrain the disease process by arresting demineralisation and facilitating remineralisation. It involves enhancing exposure to protective factors on the one hand and minimising exposure to risk factors on the other. If the competing exposures can be modified to favour protective factors then existing lesions will not progress, net remineralisation will occur, and no new lesions will develop. This management entails a combination of 'clinic-based' interventions, and 'home-based' interventions to be conducted by the patient or in the present context, the caregivers. MID management of the caries process is presented in Table 2.

Home-based management of non-cavitated lesions

A key part of the management of non-cavitated lesions involves behaviours over which the clinician has little control; these behaviours primarily involve sugar consumption and oral hygiene behaviours. Providing diet counselling (especially related to sugar consumption) and oral hygiene instruction (especially related to the optimal use of fluoride toothpaste) can have positive results.[25] Evidence is growing that motivational interviewing techniques and other social-behavioural techniques can be successful in achieving behaviour change. Reductions in ECC after such interventions have been reported.[26]

Clinic-based management of non-cavitated lesions

Fluoride-based therapies remain the gold standard for the management of non-cavitated lesions and this was reflected in the US Surgeon General's report on reducing caries risk. That report called for supervised tooth-brushing with a fluoride toothpaste, systemic fluoride supplementation, and the use of fluoride varnishes and gels.[27, 28] The most common chairside intervention for the management of non-cavitated lesions in children is the use of 5% sodium fluoride varnish, applied ideally three times per year[29] although some other caries management frameworks recommend 3-monthly follow-ups for high risk children[6]. Two other interventions growing in popularity are the use of agents to enhance remineralisation and the use of 'fissure protection'

(using GIC) for primary molars. There are some studies showing favourable retention of GIC sealants in primary molars[30-32] but further research is needed to examine the applicability of these results.[33,34] There is some limited evidence promoting the use of bio-available calcium and phosphate substrates such as CPP-ACP for managing the caries process in preschool children.[35,36] Unfortunately, most of the literature on CPP-ACP is based on *in vitro* studies[37] or on permanent dentitions of adolescents post-orthodontic treatment.[38,39] The key tools for management of non-cavitated lesions are included in Table 2.

Table 2 – MID (minimally invasive dentistry) approach to the management of non-cavited and cavitated lesions in preschool children

Clinic based care	Home based care
Sodium fluoride varnish CCP-ACP	Regular oral hygiene with a fluoride toothpaste
Pit and fissure sealants on primary molars	Dietary sugar reduction
Atraumatic Restorative Treatment (ART) Arrest of Caries (ACT) with Silver Diamine Fluoride 'Hall'stainless steel crowns	Oral health education – including dietary counselling, oral hygiene instruction, and motivational interviewing techniques

The MID approach to the management of cavitated lesions

Along with promoting home-based management of caries, the MID approach to the treatment of cavities at tooth level is focused on remineralisation and biofilm management. That is to say, treatment involves either creating an environment which is hostile to a cariogenic biofilm (e.g. by using silver diamine fluoride), or by sealing the underlying lesion from access to the surface biofilm through Atraumatic Restorative Treatment (ART), or Hall crowns. These techniques will successfully retain the primary tooth and preserve tooth structure, while at the same time minimize the possibility of upsetting the child.[22,40-42] When this treatment approach is applied to preschool children, it can also help to reduce the need for management under a General Anaesthetic (GA).[22, 41] ACT, ART and Hall crowns are further discussed below.

Arrest of Caries Treatment (ACT)

Arrest of a carious lesion through the application of silver diamine fluoride (SDF) is thought to occur by a combination of the antibacterial effect of silver in combination with the well-known anti-cariogenic effects of fluoride.[43] A single application of SDF has been shown to arrest half of previously active lesions and bi-annual applications can arrest three quarters of such lesions.[43-45] There is also some evidence that a combination of silver nitrate with fluoride varnish can also achieve arrest of caries active lesions,[46] whereas fluoride varnish alone does not appear to be effective at arresting open, cavitated lesions.[43]

ACT has been shown to be effective in pre-school children; however, the arrest rates tend to be less favourable than in older children, perhaps due to the higher chance of saliva contamination during placement in a smaller mouth. The lower rate of arrest in preschool children can be compensated for by additional applications.[47] Chu et al.[48] compared the ability of SDF solution and NaF varnish to arrest caries in preschool children, and found the SDF was far more successful. The other advantage of ACT is that it does not rule out the possibility of conventional restoration in the future. It has been shown that glass ionomer cement (GIC) restorations and composite restorations can be placed after SDF treatment without compromising bonding.[49, 50]

The use of SDF is generally accepted as safe for young children, and there are no reports in the literature of serious side-effects. The most common minor side-effect occurs as a result of the solution coming into contact with the gingival soft tissues. In this situation, a minor chemical burn and a localized whitening of the gingiva may occur. This is not associated with discomfort and it will disappear within a few days without intervention. The other common side effect is the delayed dark staining of the carious lesion after SDF application and, for that reason, caregivers should be informed of this discolouration prior to application. A temporary dark stain can also occur on the facial soft tissues (including the lips), fingers or skin if the application is not well controlled.[43] One author explored the theoretical chance of fluorosis due ingestion of the fluoride; however, this logic has not been validated and the consensus is that the risk is extremely low.[51] The fluoride concentration in a 38% SDF solution is 49,000 ppm; this equates to 1ml (more than 10 drops) of solution before potential fluorosis could occur. In contrast, it is estimated that one drop (0.05 – 0.1ml) of SDF can treat up to 6 teeth, so the amount used is safe.[52]

Differences in arrest rates appear to be related primarily to the concentration of the solution, the frequency of application of SDF, and the need to clean and dry prior to application.[45] Most protocols recommend a bi-annual application with 38% SDF, and all recommend cleaning and drying the lesion first.[44, 52] Among the tertiary prevention techniques for preschool children in the MID approach, SDF is perhaps the least costly, least invasive, and easiest to implement.[53]

Atraumatic Restorative Technique (ART)

The key goal of placing an ART restoration is the minimal removal of sound tooth tissue and the sealing of a lesion from the oral environment. Most of the literature around ART involves occlusal surfaces of the permanent dentition; however, there are some studies that examine the success in the primary dentition.[54,55] Another variation on ART is the Simplified-Modified Atraumatic Restorative Technique (SMART) which uses partial caries removal and capsulated Glass Ionomer Cements and this technique is growing in popularity across South East Asia.[56, 57] This present discussion will focus more on ART after taking into account the literature available in English language at the time of submission. One of the key advantages of the ART technique is that it does not require the use of local anaesthesia and dental 'drills' which can be difficult for a young child to cope with. It is now well accepted in the literature that leaving a small amount of carious dentine directly over the pulp (sometimes referred to as indirect pulp therapy or indirect pulp capping) is now the standard management of the deep carious lesion because the GIC restoration seals infected dentine from plaque and dietary sugar.[58]

In addition to conserving tooth structure, ART has also been associated with decreased levels of anxiety in children[59] and has been associated with a reduction in general anaesthesia waiting lists.[22] ART has been used by dentists and other dental providers in both conventional and community settings for

over 25 years, primarily for single and two-surface surface restorations. Success rates appear to be lower for two-surface ART restorations; single surface ART restorations in primary teeth have been shown to have comparable long-term success with conventional restorative techniques.[60-63] Part of the success of ART restorations may be related to fluoride release from GIC restorations,[64] and there is some evidence that GIC might also have preventive effects on adjacent teeth.[65] Additional studies are needed to confirm these findings and to examine success within very young children.

The Hall crown technique

The most successful restorative option for the management of large carious lesions in the primary dentition is the stainless steel crown; however, the traditional technique requires 'cutting down' the teeth and the use of local anaesthesia. In contrast, the Hall technique involves placing stainless steel crowns directly over decayed primary molars, which have not had prior tooth preparation. By sealing the lesion under the crown, the caries process arrests and usually no further treatment is required. To facilitate the placement of the crowns, a separating elastic module can be placed between the primary molars a few days prior to crown cementation. The procedure can be carried out without local anaesthesia. The technique is gaining international acceptance, as studies show success rates comparable to crowns placed following conventional tooth preparation.[42,66,67] Patients, caregivers, clinicians have been reported to have a clear preference for the Hall technique over conventional preparation techniques.[68]

The Conventional Treatment Approach for managing ECC

Conventional management of dental caries in the primary dentition includes the use of local anaesthesia, cavity preparation with rotary handpieces, restoration with a variety of filling materials, crowns, pulp treatments (pulpectomy and pulpotomy), and extractions - procedures which can be challenging for the young child, the family, and the dental team. It is important to note, however, that such treatment only eradicates individual lesions, it does not address the disease itself which requires management through primary prevention.[6] Conventional restorative materials including amalgam, composite, compomer, GIC, resin-modified GIC (RMGIC) and stainless steel crowns are used by dentists.[69] There appears to be wide variation among dentists and dental schools concerning recommendations about the best materials to use for primary teeth.[70-72]

Direct restorative materials

Many studies have shown that stainless steel crowns perform best, followed by amalgam.[69,73,74] The AAPD guidelines[89] also support the use of composites, compomers, and RMGICs for 1- and 2-surface primary tooth restorations; however, they do not endorse the use of GICs for Class II restorations. Chadwick and Evans (2007) concluded from their review of restorations in the primary teeth, that GIC restorations could not be recommended for Class II cavities. Despite this, GIC materials are the most popular material used by dentists in some countries.[71] Composites perform well, in terms of aesthetics and wear resistance; however, the occurrence of new lesions alongside composite restorations can be a significant problem. GIC and RMGIC restorations have the advantage of fluoride release into the surrounding tooth tissues, minimizing the chance of the development of new lesion initiation alongside restoration margins and rendering the tooth more resistant to decay should the restoration be lost.[75, 76]

Amalgam restorations have been shown in many studies to have greater longevity in primary teeth than tooth-coloured restorations (particularly GIC). However, some countries no longer recommend or permit the use of amalgam in young children (primarily for environmental reasons), and

there is a growing trend to reduce its use.[77, 78] Reliable up-to-date evidence about the clinical performance of the different tooth-coloured materials for primary teeth is lacking, especially for preschool children.[79-81] Yengopal[79] and Uribe[81] state that there is insufficient evidence to make any recommendations about which dental material should be used in the primary dentition.

Preformed restorations

Conventional stainless steel crowns are the most predictable way to restore primary molar teeth which have had pulp treatment or have extensive caries of the crown. They are also recommended for young high caries-risk children, because tooth-coloured or amalgam restorations may fail and the teeth may continue to decay.[69] However, crowns are a more costly form of treatment, and some parents object to their appearance.[42, 82, 83] In recent years, tooth-coloured crowns have become more popular for use on primary molar and incisor teeth; however, studies on their success are few, and their cost is much higher than a conventional stainless steel crown.[84,85]

Pulp treatment for primary teeth

Throughout this paper, the focus has been on restoring teeth that have cavitated lesions which are not pulpally involved. Unfortunately, this is not always the case and primary teeth may require some form of pulp treatment or extraction when the pulp becomes inflamed or loses vitality. In this situation, the clinician will need to consider a number of factors when choosing the appropriate treatment modality. These factors include the correct diagnosis of the pulpal condition, an overall assessment of the value of the tooth in relation to the child's overall development, the restorability of the tooth, alternatives to pulp therapy, the medical history, the age and cooperation of the child.[86]

Accurate diagnosis of the pulpal condition is one of the most important aspects of choosing an appropriate pulp treatment. If the pulp is irreversibly inflamed or necrosed then the options become limited to root canal therapy or extraction. In the case that a vital pulp is free from symptoms or reversibly inflamed, then therapies such as indirect pulp therapy (IPT), direct pulp capping or pulpotomy could be considered. IPT can be applied where the carious lesion is in close proximity to the pulp but the pulp is not inflamed, or where there are symptoms of reversible pulpitis. This involves removal of all the peripheral soft carious dentine except for a layer immediately over the pulp, so as to avoid exposing the pulp. A lining (e.g. with calcium hydroxide or GIC) arrests the lesion and a permanent restoration (preferably a crown) is then placed. Studies show this approach is very successful if the pulpal condition was accurately diagnosed.[87-89]

Direct pulp capping is generally recommended for traumatic pulp exposures rather than carious pulp exposures. The exposure is covered with a hard-setting calcium hydroxide or mineral trioxide aggregate (MTA). Unfortunately, the long-term success of pulp capping has been shown to be low, especially if used when there is a carious pulp exposure.[89]

Pulpotomies are indicated for carious pulp exposures where the pulp in the root(s) is still healthy. Formocresol was once the gold standard pulpotomy medicament; however, in recent years there have been growing concerns over its toxicity. Ferric sulphate and MTA have largely replaced formocresol, with similar success rates.[88,90-93] More recently, sodium hypochlorite has also been showing good success in some studies.[94, 95]

For primary teeth with pulp necrosis or an abscess, extraction is often recommended. If this occurs within a year of the normal eruption time of the successor tooth, there is usually no long-term problem for space maintenance.[89] However, if it is going to be a long time before the successor tooth erupts, space loss may occur, especially if the extracted tooth is a first or second primary molar. These considerations might indicate that root canal treatment and retention of the tooth is more desirable. For primary teeth requiring root canal treatment, a variety of resorbable root filling materials have been used with variable success. Plain zinc oxide eugenol is one of the oldest and is still widely used; however, medicaments such as Vitapex (a calcium hydroxide iodoform paste) or Kri paste (iodoform-based) have become popular in recent decades.[89, 96-98] For all types of pulp treatment, a restoration with a good biological seal to prevent microleakage is important for success.[89, 99]

Although pulp treatment of primary teeth can be very successful, it is also reliant on an effective restorative seal and stainless steel crowns are recommended for long-term survival.[8 9] It should also be noted that carrying out pulp and complex restorative treatments on a preschool child can be very challenging or not possible, and the outcome may be less than ideal[1]. Sometimes sedation or general anaesthesia may be required.

Behaviour management for conventional dental treatment

The success of any restoration or pulp treatment will depend on the cooperation of the child – and this can be unpredictable, especially in the preschool child. Factors affecting the cooperation of the child in the dental setting may include: the stage of cognitive development (influencing their ability to understand and communicate verbally); their close attachment to the parent; a fear of 'strangers'; their resistance to certain dental procedures in the mouth; anxiety related to the dental clinic environment, dental procedures and dental personnel; small mouths; and a limited attention span.[1, 100, 101] For these reasons, a number of strategies for behaviour management have been employed by dentists, ranging from simple behavioural techniques such as 'tell-show-do', to sedation and general anaesthesia.[1] A summary of techniques for behaviour guidance is presented in Table 3 including reference to a number of simple behavioural techniques. Sedation and general anaesthetics for dental treatment are discussed below.

Table 3 – Techniques for Behaviour Guidance[a]

Communication and communicative guidance	Positive reinforcement and descriptive praise
Positive pre-visit imagery	Distraction
Direct observation	Memory restructuring
Tell-Show-Do	Parental presence / absence
Ask-Tell-Ask	Protective stabilization
Voice control	Sedation
Non-verbal communication	General anaesthesia

[a]Adapted from the American Association of Pediatric Dentistry Guideline on guideline on behaviour guidance for the paediatric dental patient[86]

Sedation

Some dentists employ sedation to help manage young children who may be anxious or uncooperative. The most popular agents are nitrous oxide sedation and oral sedation (e.g. with midazolam).[34-69] Although helpful, sedation does not always improve child cooperation, and local anaesthesia is still required to carry out invasive treatment. Sometimes sedation is given along with the use of restraint/stabilization devices (such as the papoose board); however, parents in many countries are becoming more resistant to the use of restraint during dental treatment.[102, 103] The cost of sedation is also a barrier for some families. In addition, not all dentists can administer sedation which requires special training in order to perform it safely.[104-106] Given these challenges, often the preference is to provide treatment under GA.

General anaesthesia

In some countries general anaesthesia is commonly used to provide dental treatment to anxious, uncooperative, and special needs preschool children. In recent decades, use of general anaesthesia in many countries has increased despite the fact that general anaesthesia is very costly, has certain risks, and that there is a relatively high rate of re-treatment under GA, as many children develop new lesions within a year.[9, 107]

The advantages of dental treatment under GA include the fact that all treatment can be completed in one visit, the child is usually not traumatized by the procedure, and that high-quality treatment can be provided in a well-controlled environment.[9] The success of restorations placed under GA may be higher than those placed in a dental surgery.[108] Further to this, there are reports that treatment of children with ECC under general anaesthesia results in 'catch-up' growth[14] and improvements in Oral-Health-Related Quality-of-Life. These improvements in quality of life are not only observed by the individuals but also by their family members who are no-longer woken at night due to pain or burdened by dealing with challenging behaviour when they take the child to the dental clinic.[109-113]

Summary

The management of ECC in preschool children is multi-faceted, challenging and there are large gaps in the literature regarding which techniques and materials to use in the context of preschool children. This paper has reviewed three different approaches to treatment. The 'no treatment' approach may appear attractive; however, it is not accepted by the authors as the best option for most children. The conventional restorative approach is labour intensive, expensive, invasive, and often difficult for preschool children to accept without sedation or GA. Management of ECC under GA has many advantages, but is disproportionately expensive in contrast to the minimally invasive (MID) approach. The MID approach, including ART, ACT (SDF), Hall crowns, and management of early (non-cavitated) lesions, maybe the most appropriate approach for the majority of children in the South East Asian region, since access to GA is very limited. MID techniques are 'child-friendly' and can manage the disease in most children, without the need for costly general anaesthesia. MID techniques can be employed both for individual children visiting a dental clinic, and for large groups of children in a public health setting. It is recommended that further research be conducted on the MID approach for managing ECC in the SEA region. This would help to confirm the best approach for clinicians as well as public dental service providers as they endeavour to manage ECC in preschool children.

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