

Recent advances in dental management of children with special health care needs

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Abstract

Dental care is reported to be the most common unmet health care need in children with special health care needs. Barriers to provision of necessary dental care range from physical barriers in practices, economics to inadequate education. The attitudes of parents of physically or mentally impaired children present a substantial barrier to dental treatment. Parents attitude towards dentistry and dental care will be reflected either directly to the disabled child or indirectly to the provider. Dental home serves as not only a home for dental care but also a place for a growing relationship. Suggestions for home care and preventive procedures should be offered along with the opportunity for the impaired person to modify the suggestion to his or her level. Children with special health

care needs have a significantly higher prevalence of oral diseases because of the lack of oral health knowledge, access to care, and preventive measures such as fluoride supplements and dental sealants. Oral health of children with special health care needs has been found poor when compared to otherwise healthy children. Due to the complications of disability and cumulative nature of disease, regular training about oral healthcare is more important for children with Special Health Care Needs than for healthy children.

Keywords: Dental care, Barriers, Dental home, Special health care needs.

Introduction

As per World Health Organization, disabilities are term, covering impairments, activity limitations, and

participation restrictions.¹ As per World Health Organization report, total disability in world is about 10%. As per Census in India, 2011, out of total population of 121 crore, about 2.68 Cr persons are 'Disabled' (2.21% of the total population). Majority (69%) of disabled population lived in rural areas. The disabled population 56% (1.5 Cr) are males and 44% (1.18 Cr) are females. Large number of disabilities are preventable, which includes arising from medical issues during birth, maternal conditions, malnutrition, accidents and injuries. But, health sector in rural India failed to react proactively to disability. Further there are lack of affordable access to proper health care, aids and appliances. Another concern is Healthcare facilities and poorly trained health-workers in rehabilitation centres.

Though the words impairment, disability, and handicap have been used inter - changeably all the three terms vary in their meaning and definition. Phrases like 'disabled,' 'handicapped' and 'impaired' have been replaced by the term 'specially-abled.' This proves the warm welcome to the concept of 'normalization' wherein the 'tag of disability' disappears from mindsets of the specially-abled, their families, their dears and nears and the society.²

Dental care is reported to be the most common unmet health care need in children with special health care needs/specially-abled. Oral health of these people may be neglected because of their focus on disabling condition, other major diseases, or limited access to oral health care. Numerous studies have been reported on the prevalence of dental disease in persons with handicapping conditions. This article discusses the recent advances in dental management of children with special health care needs.

Barriers in treatment

Barriers to provision of necessary care range from physical barriers in practices, economics to inadequate education.

According to study done by Amith Adyanthaya,

- Inaccessibility to dental clinic (not being placed on ground floor, absence of ramp/lift facilities for wheelchair, etc.) was reportable to be the most physical barrier to access dental care.
- Level of coaching of practitioner and inadequately intended caretakers were found to be the greatest barriers and challenges to a practitioner's willingness to treat disabled children.
- Patient's behaviour and inability to establish correct communication with the patient were mentioned to be the greatest barriers.

Parental Attitudes

Parents attitude towards dentistry and dental care will be mirrored either directly to the disabled kid or indirectly to the provider. Parents might hold what is described as fatalistic or futile attitudes toward unhealthiness, including dental disease. An attitude of futility act further as a barrier to dental care if parents feel that their own teeth or those of their kids are so bad as to be considered hopeless. If a parent believes in maintaining good oral care, he/she will tend to believe it is good for the disabled kid or not.

Preventive Strategies

Preventive health programs need to be strengthened and all children should be screened at young age.

Kerala has already started an early prevention programme. Comprehensive Newborn Screening (CNS) programme seeks early identification of deficits in infants and reduce the state's burden of disability.

Awareness

People with disabilities need to be better integrated into society by overcoming stigma.

There should be awareness campaigns to coach, educate and aware people about different kinds of disability.

Success stories of people with disabilities may be showcased to infuse positive attitude among people.

American Academy of Pediatric Dentistry Recommendations on Prevention of Early Childhood Caries

- Infants shouldn't be put to sleep with a bottle. Ad libitum nocturnal nursing (breast feeding) should be avoided after the first primary tooth begins to erupt.
- Parents should be encouraged to have infants drink from a cup as they approach their 1st birthday; infants ought to be weaned from the bottle at 12 to 14 months of age.
- Consumption of juice from a bottle should be avoided; once juice is offered, a cup should be used.
- Oral hygiene measures should be provided by the time the first primary tooth erupts.
- An oral health consultation visit within six months of the eruption of the first tooth is recommended as an opportunity to educate parents and provide anticipatory guidance for the prevention of oral disease.

Infants (birth to 1 year of age)

Counsel parents to clean the infant's gums daily before eruption of the first primary tooth to establish a healthy oral flora, using the following procedure:

- Cradle the baby with one arm.
- Wrap a moistened gauze square or washcloth around the index finger of the hand of the opposite arm and gently massage the teeth and gingival tissues.

- Introduce a soft-bristled toothbrush during this age only if parents feel comfortable using the toothbrush.
- Do not use dentifrice containing fluoride, because fluoride ingestion is possible.

Toddlers (1 to 3 years of age)

- Introduce a toothbrush into the plaque-removal procedure (if not done earlier).
- Use dentifrice beginning around the age of 2 years; use solely pea-sized quantity of dentifrice (apply across the narrow width of the toothbrush, rather than along its length, to decrease the chance of applying an excessive amount).
- Encourage the kid to begin rudimentary brushing; however, parents should remain the primary caregiver in oral hygiene procedures.

Preschool-age children (3 to 6 years of age)

- Remind parents to continue their responsibility as primary providers or supervisors of oral hygiene procedures. Continue to use only a pea-sized quantity of toothpaste on the child's toothbrush.
- Use daily flossing if any interproximal area has tooth-to-tooth contact.

Dental Home

A “dental home”, is not solely a home for dental care but also a place for family centre care and growing relationship. Thus, Casamassimo suggests that parents of children with disabilities begin early in finding a dentist and to come prepared and Casamassimo explains that dentists learn a lot from their patients and suggests, “a dentist’s lack of familiarity shouldn’t be a turn-off.”

Hygiene at Home

Because dental access is limited for those with special needs, it is essential to start out good oral hygiene habits at home. Like everyone else, for a healthy mouth, those with disabilities need to brush daily, floss daily, and visit the

dentist regularly. It is suggested that the “2-2-2 rule” be followed as a guide. A toothbrush should be used for 2 minutes, 2 times a day, while waiting 2 hours between brushing and eating or drinking.

Dental Health Education

Dental health education and preventive procedures will probably require certain modifications. Suggestions for home care and preventive procedures should be offered along with the opportunity for the impaired person to change the suggestion to his or her level.

Preventive Procedures

Patients with Special Health Care Needs may benefit from sealants. Sealants reduce the risk of dental caries in susceptible pits and fissures of primary and permanent teeth.³ Topical fluorides could be indicated when caries risk is increased.⁴ Interim therapeutic restoration (ITR),⁵ using materials such as glass ionomers that release fluoride, may be useful as both preventive and therapeutic approaches in patients with Special Health Care Needs.



Figure 1: Pit and fissure sealants



Figure 2: Glass ionomers

Anticipatory Guidance

The American Academy of Pediatric Dentistry recommends that infants be scheduled for an initial oral evaluation within six months of the eruption of the first primary tooth but by no later than 12 months of age. Specific recommendations include elimination of bottles in bed, early use of soft-bristled toothbrushes (with parental supervision) and limitation of high-carbohydrate food intake after teeth have been brushed.

Ideally, infant oral health begins with prenatal oral health counselling for parents; a postnatal initial oral evaluation should be performed within six months of the eruption of the first primary tooth in an infant but no later than 12 months of age.

At the infant oral evaluation visit, the dentist should do the following

- Obtain a thorough medical and dental history, covering the prenatal, perinatal and postnatal periods. Perform a thorough oral examination.
- Assess the infant's risk of developing oral and dental disease, and determine the appropriate interval for periodic reevaluation based on the assessment.
- Provide anticipatory guidance for the parent or other caregiver regarding dental and oral development,

fluoride status, non-nutritive oral habits, injury prevention, oral hygiene and effects of diet on dentition.

- The dentist who performs these services for an infant should be prepared to provide therapy when indicated or should refer the infant to an appropriately trained person for necessary treatment.

Management of children with special health care needs

Oral Manifestations of Intellectual Disability: These children have early childhood caries. Salivary flow is altered due to the multiple medications, increased plaque and calculus formation which give rise to poor oral hygiene further leads to halitosis.

Congenitally missing permanent teeth and enamel hypoplasia, broken anterior teeth and soft tissue complications are more commonly seen. Lip biting is most commonly seen. Abnormal jaw growth, Loss of space in the permanent dentition leads to malocclusion. Speech impairment because of the early loss of teeth are also seen.

Dental management:The preferred material for the carious teeth is glass ionomer cement due to the fluoride release; multi surface carious teeth stainless steel crowns are beneficial. Single visit endodontic treatment is considered, as working length radiographs would be difficult to obtain, an apex locator would be helpful.

Fixed prosthodontics is more appropriate than removable partial dentures. Less time is needed for tooth preparation in resin bonded bridges which are more helpful. Removable partial dentures and complete dentures are contraindicated for kids whose seizures are poorly controlled.

Mouth wash or rinse should be used in an appropriate technique as gargle would not work with all the patients especially with impaired swallowing reflex. If patient is on medication like sodium valproate or dilantin regular

professional prophylaxis is required. If the child is having drug induced gingival over growth and interferes the occlusion gingivectomy is the treatment of choice but periodontal packs may not be well tolerated and to overcome this electro surgery or laser surgery is preferred.

Oral Manifestations of Down Syndrome: They have a small drooping mouth and open mouth posture, protrusive, fissured tongue, macroglossia. Thick, dry and fissured lips, high arched palate with bifid uvula, cleft lip and palate. Eruption of Teeth could also be retarded/early shedding of deciduous teeth is noted. Severe, early onset of periodontal disease⁶, hypodontia of teeth and low incidence of dental caries are also seen.

Occlusion

Anterior open bite and crossbite, class 3 tendency and small maxilla.

Dental Management: Avoid sugar in foods, snacks, and treats. Frequent rinsing & twice daily home oral care, consider topical fluoride, fluoride varnish and sealants, frequent cleanings, consider Chlorhexidine, ensure home oral care is properly done.

Use panoramic X-rays to look for missing teeth, maintain primary teeth as long as possible and consider using spacers where teeth are missing.

Oral Manifestations of Epilepsy

Injuries caused by the fits: (i.e) Soft tissue lacerations of tongue or buccal mucosa, facial fractures, trauma to teeth-avulsion, luxation, fractures, subluxation of the temporomandibular joint.⁶



Figure 3: Lip Biting



Figure 4: Tongue bite

Injuries Due to Drug Therapy: Gingival Hyperplasia, recurrent aphthous like ulceration, anomalous dental development like small teeth, delayed eruption.⁶



Figure 5: Gingival Hyperplasia

Dental Treatment: Appointments should be kept short.⁶ Clinical rehearsals to be done. Importance of toothbrushing procedures and regular dental review should be stressed.⁶ Local anesthesia should be preferred to general anesthesia as far as possible during the treatment of epileptic patients.

Restorative Treatment: Treatment should be determined according to the type and intensity of patients' seizures. Metal temporary crowns or implant-supported-bridges are more practical than amalgam or porcelain restorations because of the risk of damage during seizures. A rubber dam should be used in light of the risk of seizure during restorative treatment.

Orthodontic Treatment: Orthodontic treatment can be conducted easily in epileptic patients. A fixed appliance should be preferred over a removable appliance. Otherwise, a removable appliance should have maximum retention. An occlusal splint must also be retentive when used to treat epileptic patients who have temporomandibular disorders.

Oral Manifestation of Cerebral Palsy

Prevalence rate of malocclusion with increased over-jet and overbite, unilateral cross-bite and open bite related to abnormal oral habits is twice more common.⁷ This can be due to the following reasons:

- a. Uncoordinated movement of jaws lips and tongue.
- b. Mouth open posture with postural tongue thrust and mouth breathing.

Highest prevalence of traumatic dental injuries is seen in cerebral palsy patients with hemiplegia (40.6%). A high prevalence of bruxism who have Cerebral Palsy has been reported in several studies. The prevalence of periodontal disease is higher.

This is due to poor manual dexterity of the child to perform good oral hygiene measures, anti-convulsant

drug induced gingival enlargement. Dental erosion is common in Cerebral Palsy patients. X. Lin et al.⁸ found that a high prevalence of developmental enamel defects was found among the children with Cerebral Palsy.

Dental Management of Cerebral palsy

Postural compliance in the dental chair: The manifestation of increased muscular rigidity, hyper contractility, uncoordinated movements and ataxic gait might compromise the compliance of child to lie down on a dental chair.

Preventive care: Includes good oral hygiene practices, training and awareness of oral hygiene practices to the caretaker, fluoride and sealant application and periodic review are emphasised.⁹

Oral Manifestations of Autism Spectrum Disorder

Children with Autism Spectrum Disorder have poor muscle tone, poor coordination, drooling, a hyperactive knee jerk, and strabismus. Because of poor tongue coordination, children with autism spectrum disorder tend to pouch food instead of swallowing. This habit leads to increased susceptibility to caries.⁶

Dental Management

Operatory Design: To minimize anxious and uncooperative behaviours, a relaxing light, rhythmic music provided with or without headphones, and white noise should be considered to adapt the dental environment to an autistic patient's hypersensitivities.¹⁰

Oral Hygiene Measures: There are several forms of visual pedagogy that can promote engagement in productive activities and reduce confusion and distress during toothbrushing. It consisted of a set of drawing pictures, one for each page, showing a step-by-step process of toothbrushing, with clear short descriptions and set up in the style of a table calendar. Most parents mentioned that toothbrushing pictures with clear

background attracted their child's attention and helped the child to readily participate in toothbrushing at home.

Communication: Some autistic patients require assistive communicative devices, such as a Smart/Scan 32 pro, an augmentative communication device or a Picture Exchange Communication System (PECS).



Figure 6: Visual pedagogy



Figure 7: Smart/Scan 32 pro

Considerations for Restorative Treatment: Typically used restorative materials in patients with autism include amalgam, resin-based composites and glass ionomers.¹⁰

Behavior modification: Behavior modification techniques like film Modelling, google Sketch up and smart phone app application can be done.

Behavior Therapy Techniques by Lovoos have proved to be effective in producing behavioral changes in autistic children.⁶

Oral Manifestations of Visual Impairment patients:

Visually impaired/blind patients have a state of compromised oral health, with high prevalence of caries and/or periodontal problems. Prolonged immature swallowing pattern due to reluctance to consume solid foods, poor oral hygiene related to learning disabilities and hypoplastic teeth have been identified as possible oral manifestations in visually impaired children. Trauma to anterior teeth and increased gingival inflammation due to inability to look and remove dental plaque are also found.

Dental management: Complete medical history should be taken along with the degree of visual impairment is ascertained prior to treatment.

Plaque removal techniques: Both Fone's method and Modified Bass method of tooth brushing were found to be very effective in improving the oral hygiene of visually impaired individuals by Joybell C et al. in 2015.¹¹ A 'touch sense do' technique can be used instead of 'tell, show, do' technique to demonstrate ongoing dental procedures to the patient.¹² Modifications of different handles of toothbrush, powered toothbrushes, modified toothbrush with music can be used for brushing.



Figure 8: Modifications of different handles of toothbrush

Audio Tactile Performance Technique: Audio tactile performance technique' (ATP), a multisensory health education method is a very specially designed effective communication tool to educate visually impaired children about oral hygiene maintenance.¹¹ Three components namely, audio, tactile, and performance are incorporated in ATP technique. Children have to be verbally informed first about the importance of teeth and methods of proper brushing (AUDIO component). Large sized model should be used so that the children can feel the teeth on it (TACTILE component). Assistance has to be provided so that the children can practice proper tooth brushing method in the model. Children should be asked to feel their teeth with the help of their tongue to identify the presence of any hard deposits or irregularities. Children should be asked to brush their own teeth in the prescribed manner under adequate supervision. (PERFORMANCE).¹¹

Dental health education: Self-modelling and teledentistry can be used efficiently to provide dental health instructions, but individual's level of impairment should be considered and modelling should be customized accordingly.¹² Models, audiotapes, magnifying aids, large print materials, raised label markers, braille scripts, bold scripts, etc. can be used as proper instructional aids.

Oral Manifestations of Hearing Loss patients: Study done by Jain et.al reported oral health status showed poor oral hygiene and low utilization of dental health services.¹³ Children with handicapping condition have more untreated cavity and had more extracted teeth compared to their normal persons. According to the study conducted by Kumar et al (2003) in Bel-gaum, Karnataka, it was observed that periodontal health was generally poor in every child. Results of this study showed 35% of the children had bleeding gums or calculus.

Dental Management: Champion J et al. Concluded that removing masks while talking, learning to use simple signs and reducing background noise may improve communication with hearing-impaired/hearing loss children. Positive reinforcement can help to serve as one of the best aids to continuously produce desirable behaviour. During explaining the procedure to the patient any sort of loud tone or shout should be avoided. Things that a dentist tells the patient should be spelt and talked about slowly and clearly so that the patient has enough time to understand and interpret by lip reading. Amplification of sounds maybe possible by tuning in hearing aids. Noise of airtor may be distressing to the child if amplified.¹⁴

Oral Hygiene Status of Poliomyelitis: The overall poor oral hygiene and periodontal status and a significant effect of limbs involved in disability on the oral hygiene and periodontal status of children who have Poliomyelitis. Highly alarming situation needs immediate attention as their dental health status is related to their social acceptability.

Even though efforts have been made in the western world to enhance the oral health of these less fortunate children, no attention has been directed by the health authorities in India. In our opinion, oral health care should be approached jointly with general health care in order to achieve more holistic view of the individual's physiological and psychological well-being.

Dental Management

- (a) Long appointments should be avoided.
- (b) Morning appointments are generally better than afternoon appointments.
- (c) It should be determined whether the patient has a partner, spouse, or therapist who will accompany him/her

to appointments and help set up appointments, consultations, etc.

(d) The practitioner should remember that because small children may be stressors for these patients, appointment schedules for other patients, especially energetic or noisy children, should be avoided.

(e) Patients should be encouraged to use elevators or ramps in the building and to avoid using steps.

Oral Findings of Scoliosis: It includes high arched palate, enamel hypoplasia, class I malocclusion with severe crowding, vertical open bite, deep palate, mouth breathing and poor oral hygiene.¹⁵

In dentistry, study of the relationship between occlusal problems and the spine are of increasing interest. This is the result of a greater incidence of pain in the muscles of the neck, trunk, the upper and lower limbs, and in the Temporomandibular joints (TMJ) of patients with occlusal dysfunction. There are several conditions that impede normal trunk alignment in the frontal plane, and it appear interesting to analyze whether such conditions also affect dental occlusion.

Dental Management

Since the patient was unable to sit down for a prolonged period in a semi – supine position on the dental chair, short appointments of 25-30 minutes period were maintained and cushions placed along the backrest to simulate a restraint '**beanbag dental chair restraint**'. The beanbag dental chair insert is used for persons who need more support and less immobilization in a dental environment.

- Preventive measures like diet counseling, placement of sealants and topical fluoride varnish applications can be used.
- Topical fluoride varnish on a semi-annual basis was placed for its dental caries effectiveness. By the use of

fluoride varnish, the fluoride ion remains in intimate contact with the enamel surface for an extended period of time compared to fluoride solutions, hence there is increased cariostatic action.

- Patient was educated and motivated to follow regular oral hygiene measures at home. He was advised to use fluoridated dentrifice, follow fones technique of tooth brushing, change his tooth-brush once in 3 months and floss regularly.¹⁵

Oral Manifestations of Fetal Alcohol Syndrome: Oral challenges in patients with Fetal Alcohol Syndrome can include, soft enamel; rampant caries; mouth breathing caused by facial deformities, which leads to dry mouth, poor tongue thrusting, temporomandibular joint disorders, cleft lip/palate, malocclusion and maxillary overjet.¹⁶

Dental Management of Fetal Alcohol Syndrome:

For the Dentist:

Be kind to the child-use humour and be happy.

- Make the operatory area feel safe.
- Prevent distractions, such as knocks on the door, etc.
- Let the child look at the equipment.
- Provide a play area.
- Learn regarding the child's interests and document them.
- Use full spectrum lighting
- Consider having a lava lamp in the operatory.¹⁶

Oral Manifestations of Fragile X Syndrome: Most frequent intraoral anomalies are an high arched palate, cleft palate, the presence of mesiodens, dental hypomineralization, and abrasion of the occlusal surfaces and incisal edges as well as an increase in the dimensions of the dental crowns in the mesiodistal, and cervico-occlusal orientation, which produces severe bone-dental discrepancies.¹⁷

Dental Treatment of Fragile X Syndrome: Mode of dental treatment depends on the level of developmental delay, cognitive ability, and degree of hyperactivity. Those with mild cases may be treated by scheduling short appointments and using immobilization and/or conscious sedation. Severely affected individuals should be treated within the operating room under general anesthesia.¹⁸

Conclusion

Children with special health care needs have a significantly higher prevalence of oral diseases because of the lack of oral health knowledge, access to care, and preventive measures such as fluoride supplements and dental sealants. Oral health of children with special health care needs has always been found poor when compared to otherwise healthy children in respect to the status of their dentition, periodontium their treatment needs and dentofacial anomalies. Due to the complications of disability and cumulative nature of disease, regular training about oral healthcare is more important for children with special health care needs than for healthy children.¹⁴

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