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Opinion Article

Oral health in children with cerebral palsy: A pediatric neurologist's perspective

Aman Preet Singh Sohal

Department of Pediatric Neurology, Neuropedia Children's Neuroscience Center, Dubai, United Arab Emirates.

***Corresponding author:**
Aman Preet Singh Sohal, Department of Pediatric Neurology, Neuropedia Children's Neuroscience Center, Dubai, United Arab Emirates.

aman.sohal@neuropedia.ae

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ABSTRACT

Cerebral palsy, one of the most common causes of physical disability in children, is a group of complex neurological disorders caused by non-progressive injury to the developing brain which leads to abnormalities of movement and posture. Dental surgeons must be aware of common practical neurological problems encountered by these children on a day-to-day basis. Awareness of the various factors and strategies mentioned in the article will not only have a major impact on the child's oral health but also on the quality of life of these children and their families.

Keywords: Cerebral palsy, Children, Oral health

Cerebral palsy (CP), one of the most common cause of physical disability in children, is a group of complex neurological disorders caused by non-progressive injury to the developing brain which leads to abnormalities of movement and posture.[1] It can be a daunting task for a dental surgeon when dealing with children with CP, especially when the child has the severe form complicated by other neurological associations such as uncontrolled body movements, seizures and epilepsy, balance-related abnormalities, sensory dysfunction, and intellectual disability. The prevalence of CP is approximately 2.1–4 per 1000 live births and is commonly seen in extreme premature babies.[2,3] The general dental practitioner must have basic understanding of various types of CP to be able to deal with any challenges that may arise on the operating chair. Briefly, one of the common classifications of CP is on the basis of the type of body movement and posture into spastic (pyramidal), nonspastic (extrapyramidal), and mixed type. Spastic CP is the most common type which presents with increase dynamic tone in the muscles of one or more limbs of the body and is usually seen in extreme premature babies, wherein spastic diplegic CP affecting both lower limbs is by far the most common type. Depending on the severity, children with spastic CP may also have intellectual disability, seizures, and difficulty speaking and swallowing. Non-spastic CP, which is the other group, includes dyskinetic (dystonic-athetoid) CP and ataxic CP. The former is associated with variable muscle tone that may fluctuate and children can become very rigid, back arch and have dystonic crises in the severe form or can have dyskinetic and writhing athetoid movements. Ataxic CP is less common and is marked by problems with balance and depth perception, as well as an unsteady, wide-based gait. "Mixed CP" comprises a combination of the above forms.[4]

Children with CP are at higher risk of dental problems due to distinct physical and intellectual challenges which have major implications on their oral care. Studies have shown a higher risk

of dental disease in children with CP who have a higher burden of neurological insult.[5] These children have a higher risk of dental disease partly due to difficulties in maintaining effective oral hygiene and partly because health-care professionals and parents are "focusing" on other pressing demands such as seizures, muscle tone, and physical disability. Children with CP have similar oral health issues as other school-going children, but these can be compounded due to common occurrence of the underlying neurodisability. Some of the common oral health problems encountered include periodontal disease, dental caries, malocclusion, bruxism, and excessive drooling.[6] Dental caries is by far the most common oral health issue seen in pediatric neurology clinic which needs urgent referral to a pediatric or general dental practitioner.

It is a well-known fact that if left untreated, poor oral health in children with CP can have negative impact on their physical health.[7] A comparative study between oral health status in children with CP to normal children in India revealed that only 30% of the CP children had good oral hygiene as opposed to 56% in control group. Interestingly, only 22% of children had ever visited a dental practice since birth.[8] However, the impact of dental disease on the oral health-related quality of life (OHRQoL) of children and adolescents with CP is not well researched, particularly in a low-resource setting country. A recent study in children with CP with poor oral health in a low-resource setting revealed a significant negative impact on OHRQoL, especially for participants who had tooth/mouth pain, bad breath, disrupted sleep, and avoided smiling due to dental caries. The parents of many of these children reported of being frequently guilty and upset. Apart from this, the study also reported painful teeth/mouth, food caught between teeth and having trouble in drinking, eating, or chewing firm foods between 5 and 7 times higher as opposed to children and adolescents with good dental hygiene.[9] Although there is no clear guidance on the number of visits per year to a dental practitioner, in author's opinion, it is imperative that children with CP visit the clinic at least once every 6 months for a routine dental checkup to avoid complications. The basic principles as per the American Dental Association should be followed which include receiving oral health care before the teeth erupt by wiping their gums down with a warm cloth.[10] Pediatricians and general practitioners should encourage early home dental care and hygiene and parents should learn to start gently daily cleansing of the incisors with a soft cloth or an infant soft toothbrush.[6]

There are numerous "hands-on" approaches in dealing with children with CP at a practical level which vary from clinician to clinician on the basis of his/her experience. However, one cannot argue that the degree of intellectual disability of the child with CP is one of the foremost characteristics which determine the approach taken by the clinician. Approximately 25% of children with CP have severe intellectual disability but the majority have normal or mild-to-moderate intellectual disability, therefore, it is important to have a conversation with the parent or carer to determine child's baseline functional capabilities. Some children with CP may be too shy to initiate talk, but they listen carefully and can have a pleasant sense of humor. One must set aside extra time to explain oral health issues and procedures using simple, direct instructions avoiding medical jargon and repeating them often to compensate for any short-term memory issues. It is also vital to maintain effective communication with child during the procedure by encouraging verbal or non-verbal gestures to ensure cooperation from the child and the carer.[11]

Visual and hearing impairments are also commonly seen in children with CP. They commonly have cortical visual impairment, visual-motor difficulties, strabismus and refractory errors, etc., which can affect their behavior when they are in the dental practitioner's room. The clinician must take time to gauge the level of assistance the child needs visually and use other senses, for example, touch, hearing to communicate with them. A gentle warm handshake with the child will always put them at ease, and if possible use large print font if the child is able to read. The clinician must keep the verbal communication channel open at all times if the child is not hearing impaired. If, on the other hand, they have hearing impediment, the dental surgeon should try to use simple visual cues to explain and comfort the child. It may be useful to adjust their hearing aids or even turn them off once the procedure starts as they may find the sound of "drill" uncomfortable. If the children are used to sign language, the clinician should take the carer in confidence before engaging with the child so that they can explain the dental "jargons" to the child in simple sign language before the child comes in the clinic room.[11]

Epilepsy and seizures are a major comorbidity in children with CP and various studies report the incidence between 15 and 41% worldwide.[12,13] It is important to take an elaborate history of seizure frequency, anti-epileptic medications, the use of rescue medication for prolonged seizures, and consulting the child's pediatric neurologist for any valuable information. The dental practitioner must make an concerted effort to contact the child's pediatric neurologist and discuss the dental plan preferably through written/email communication, particularly if it involves general anesthesia which has potential ramifications in children with severe CP, for example, increased risk of seizures post-anesthesia, airway compromise, etc.[14,15] The dental practitioner should also be aware of potential side effects of commonly used anti-epileptic medication which can have a knock on effect on child's oral health, for example, gingival hyperplasia (phenytoin),

excessive secretions and drooling (benzodiazepines), and xerostomia and hyponatremia (carbamazepine, oxcarbazepine).[16] The dental surgeon should be prepared to manage the child in case he/she has seizure on the dental chair all the while ensuring no obstruction to the patient's airway. They should be familiar with the use of rescue medication, for example, rectal diazepam, buccal or intranasal midazolam if the seizures are prolonged or lasting up to 5 min. Once the seizure terminates, turns the child in the left lateral recovery position, and advises the carers to visit the nearest pediatric emergency department, or calls the emergency services as soon as it is possible.

Movement disorders in children with CP can be a challenge for the dental surgeon which needs a certain degree of familiarity to deal with on a day-to-day basis. A large proportion of children has significant spasticity; therefore, allowance should be made for the wheelchair access and adjustments have to be made to the dental chair taking into consideration multiple joint contractures the children may have. Be aware of the fact that dystonic movements can get worse when the child is anxious or nervous, so try to help the child relax which can reduce the frequency or intensity of movements. Placing the hand gently on the limb which is dystonic may also help them relax and decrease the movements before the procedure is started. The clinician should also try and avoid sudden head-and-neck movements in the child which may induce asymmetric tonic neck reflex, a form of primitive reflex, wherein the arm and leg on the ipsilateral side stiffen and extend and the arm and leg on the opposite side flex. The other primitive reflexes which may occur on the dental chair include tonic labyrinthine reflex which may occur when the neck is suddenly extended while the child is lying on his/her back, and as a consequence, the legs and arms extend, and the back and neck arch. This is also a form of dystonic response, so the surgeon should gently try to flex the neck and the lower limbs at the hip while communicating with the patient. Finally, a startle reflex can occur due to sudden external stimuli, such as noises, lights, or cold instruments which can trigger uncontrolled, often forceful movements involving the whole body. Therefore, it is imperative that the child is pre-informed of any such movements or stimuli to minimize any dystonic crisis on the operating chair.

To summarize, an empathetic clinician will always go an extra mile to make the children with CP and their carers comfortable before starting the procedure. Meticulous planning of every procedure must be undertaken before the child arrives at the dental practice. Effective verbal and non-verbal communication is paramount during the procedure to minimize any dystonic crisis which may occur on the operating chair. It is vitally important for the dental practitioner to have clear written communication with the child's pediatric neurologist to avoid any complications during the procedure. Awareness of the various factors and strategies mentioned will not only have a major impact on the child's oral health but also on the quality of life of these children and their families.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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