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Review Article

Oral health status and treatment needs of children with sensory deficits: a narrative review

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ABSTRACT

Oral health is an inescapable component of overall health. Oral health care and maintenance is an essential component of overall growth and development of children. Inculcating and following good oral hygiene practices with appropriate diet modification is a prerequisite to achieving sound oral health. Oral health is an important aspect of health for all children, and is more important for children with special health needs. Children with sensory deficits deserve the same opportunities for oral health and hygiene as those who are healthy. Unfortunately, oral health care is one of the greatest underserved health needs of disabled people. Inadequate dental care or poor dental public health measurements may have negative influence on their oral health status. Hence this review discusses the types, epidemiology, classification, etiology, clinical features, oral health status, treatment needs and dental management of children with sensory deficits.

Keywords: Child, Oral health, Sensory deficits, Treatment needs

INTRODUCTION

Oral health is an integral part of overall health in which oral cavity plays a vital role in the life of human beings, through functions like mastication, aesthetics, phonetics, communication, and emotional expressions. It is linked to happiness and good general health. There is evidence that aesthetically acceptable and functionally adequate dentitions affect self-esteem, confidence and socialization.[1] It is of paramount importance to safeguard oral health of all children from childhood, else poor oral health can lead to various dental diseases.[2]

Sensory impairments encompass multiple impairments of the sensory system. It may include visual impairment that affect sight, hearing impairment that affect sound perception, speech impairment that hinder communication, olfactory impairment that alter their sense of smell, sensory processing disorders that disrupt the integration of sensory information, and multi-sensory impairment (MSI) that combine multiple sensory challenges.[3]

Children with sensory deficits pose a special challenge to dental professionals, primarily because of issues with proper communication and they are at an increased risk of developing oral diseases because of poor access to dental care facilities.[4] This review outlines the epidemiology, classification, etiology, clinical features, oral health status, treatment needs and dental management of children with sensory deficit which signifies an unmet back log of treatment needs among this population.

TYPES

Sensory deficits include children with visual impairment, hearing impairment, speech impairment, and mental disabilities.[4]

VISUAL IMPAIRMENT

Vision is generally considered to play a primary role in how we interact with the world around us. The sensory deficit in visually impaired children is not able to use vision as the primary sense.[5]

Epidemiology

Globally, at least 2.2 billion people have a near or distance vision impairment.[6]

In India the prevalence of childhood blindness varied between 0.6 per thousand to 1.06 per thousand and prevalence of visual impairment varied between 2.05 per thousand to 13.6 per thousand.[7]

Classification

The ICD-11 classification of visual impairment (World Health Organization, 2019) is given in Table 1.[8]

Table 1: ICD-11 classification of visual impairment.

Category	Presenting distance visual acuity	
	Worse than	**Equal to or better than**
0 mild or no visual impairment	-	6/18 3/10 (0.3) 20/70
1 moderate visual impairment	6/18 3/10 (0.3) 20/70	6/60 1/10 (0.1) 20/200
2 severe visual impairment	6/60 1/10 (0.1) 20/200	3/60 1/20 (0.05) 20/400
3 blindness	3/60 1/20 (0.05) 20/400	1/60* 1/50 (0.02) 5/300 (20/1200)
4 blindness	1/60* 1/50 (0.02) 5/300 (20/1200)	Light perception
5 blindness	No light perception	
9	Undetermined or unspecified	

* Or counts fingers (CF) at 1 metre

Etiology

The World Health Organization (WHO) classifies the causes of childhood blindness according to the anatomical site most affected and the underlying etiology. Visual loss in infants can be either prenatal or postnatal.

Prenatal

It includes congenital anomalies – anophthalmos, microphthalmos, and coloboma; congenital cataract; retinal dystrophies such as Leber's congenital amaurosis; infantile glaucoma, and **c**ongenital cloudy cornea.

Perinatal

It includes cortical impairment from birth asphyxia, ophthalmia neonatorum, and retinopathy of prematurity.

Postnatal

It includes trauma, hypertension, premature birth, diabetes mellitus, glaucoma, leukemia, and haemorragic disorders.

Clinical features

They cannot see far away and cannot read a book of less than 12 point in size of letters. They rely more on memory and hearing power. Delayed development of locomotor behaviour is seen. Their motor skills are also found poor due to poor mobility power. In most of the cases concepts are developed through visual means, so they may have poor cognitive power.[9]

Oral health status

Children with visual impairment often face various challenges in their day-to-day skills.[10] They generally have a state of compromised oral health, with a high prevalence of caries and/or periodontal problems, and often have limited knowledge about oral health.[11] Oral hygiene maintenance is one of the most difficult tasks for them because they are not able to detect and recognize oral disease early and could not be able to act promptly, if not adequately informed.[12]

Prolonged immature swallowing pattern due to a reluctance to consume solid foods, poor oral hygiene related to learning disabilities, as well as hypoplastic teeth have been identified as possible oral manifestations. Trauma to the anterior teeth also occurs with a higher frequency than in the normal population. Increased gingival inflammation due to the inability to visualize and remove the plaque.[11]

Treatment needs

Timing and frequency are of two important variables for oral hygiene procedures in visually impaired children. The timing of the procedure should be resolute by the life-style of the visually impaired person and their family and the care-taker. Child who can perform brushing independently frequent brushing is encouraged to prevent plaque growth.

Topical fluoride application and pit and fissure sealants are recommended to prevent dental caries and valuable adjuncts for these children. Fluoride dentifrices and rinses should be prescribed to be used daily and depends on individual patients. Fluoride varnish is ideal for children who do not expectorate. It is shown to reduce occlusal caries effectively and should be used whenever indicated. Preventing oral disease is the most desirable way of ensuring good dental health for these children.[11]

Dental management

Direct light should be avoided as these patients may be sensitive to light, provide them with safety or tinted glasses.

If patients already wearing glasses, ask them if they want to remove and keep them.

Explain every procedure before starting and smell of the material before placing it in oral cavity as they have an alternative heightened response to smell and touch.

Make them feel the touch on their hand before it goes to the oral cavity as sudden application of dental instruments should be avoided.

Differentiate between the sounds of instruments such as mouth mirror, explorer, or probe as they are frequently used in oral cavity.

Motivate them and teach them correct brushing technique and discourage self-inflicting habits as they are very traumatic.

Do modification as per their convenience in brushing and flossing.

Record the instruction for them so that they can access it as per their convenience.

Ask them for regular follow ups and checkups.[2]

HEARING IMPAIRMENT

As hearing is a prerequisite for the development of normal speech and language. The sensory deficit present in children with hearing impairment is unable to hear sounds adequately.[2]

Epidemiology

CDC data have shown that approximately 1 to 3 per 1,000 children have hearing loss.[13] In India the prevalence of hearing loss was 6.6% to 16.47% in children. Rural areas children (32.8%) showed a higher prevalence of hearing impairment as compared to urban areas children (6.8%).[14]

Classification- according to the severity of condition (WHO)

No impairment

It includes 25 dB or better (better ear), no or very slight hearing problems, and able to hear whispers.

Slight impairment

It includes 26–40 dB (better ear), and able to hear and repeat words spoken in normal voice at 1 meter.

Moderate impairment

It includes 41–60 dB (better ear), and able to hear and repeat words spoken in raised voice at 1 meter.

Severe impairment

It includes 61–80 dB (better ear), and able to hear some words when shouted into better ear.

Profound impairment including deafness

It includes 81 dB or greater (better ear), and unable to hear and understand even a shouted voice.[2]

Etiology

Individuals are most susceptible to their effects during critical periods in life.

Prenatal period

It includes genetic factors, including hereditary and non-hereditary hearing loss, and intrauterine infections – such as rubella and cytomegalovirus infection.

Perinatal period

It includes birth asphyxia, hyperbilirubinemia, and low-birth weight.

Childhood and adolescence

It includes chronic ear infections (chronic suppurative otitis media), collection of fluid in the ear (chronic non-suppurative otitis media), and meningitis.

Factors across the life span

It includes cerumen impaction, trauma to the ear or head, loud noise/loud sounds, ototoxic medicines, work related ototoxic chemicals, nutritional deficiencies, viral infections and other ear conditions, and delayed onset or progressive genetic hearing loss.[15]

Clinical features

It includes delayed language skills, abnormal speech, learning difficulties, not paying attention to conversations, not responding when someone calls their name, and trouble hearing over background noise.[16]

Oral health status

Children with hearing impairment are at increased risk of developing dental problems because of their inability to be educated and communicated from the dental professionals. Lack of sign language and awareness among health professionals coupled by shortage or absence of aids in communication could be a major reason for the barrier in delivering oral health care.[4] These communication barriers, often lead to mental distress, emotional or physical abuse, practical problems, and poor social relationships, thereby leading to limited activity. As a

result, they become recipients of inappropriate oral health.[17]

These children typically depend on parents, siblings, or caregivers for their oral hygiene. Many caregivers are not educated or have no knowledge of oral hygiene as well as adequate nutrition for them. They may indulge in unhealthy eating habits and that may thus lead to poor oral hygiene, demonstrating the higher prevalence for dental caries and increased risk of periodontal infection.[2,18]

Treatment needs

Children with hearing impairment have high prevalence of dental caries, periodontal problems and unmet dental treatment needs with low attendance to dental services.[19] There is a need for preventive care, restorations, extractions, crowns and pulp care. Mehta et al reported most of them required prompt, preventive and routine treatment.[20]

Dental management

Obtain the preferred way of communication either on the day of the visit or if possible, before that. Keep the parents within the child vision as the child feel safe in their presence and make an attempt to establish communication.

Use the nonverbal form of communication effectively with the help of body language, facial expression at all the time. Institute tell-show-do technique and modelling technique depending upon age and severity of impairment.

In case the child is using hearing aid, reduce background noise and rotary noise and avoid long appointments. Posters, drawings, and photographs can be used as an alternate way of explaining dental procedures.

If child uses sign language as a mode of communication, then his/her parents can be helpful in explaining procedures to the child. Preventive dentistry should be practiced by maintaining a swift dentist-patient relationship.[2]

SPEECH IMPAIRMENT

Speech is important as it enables people to express their wants and needs, thoughts and ideas, argue a point of view, develop their use of language in writing and engage in successful interactions with others. The sensory deficit in children with speech impairment is impaired ability to produce speech sounds.[21]

Epidemiology

As per the Census of India 2011, the National Survey Sample Organization (NSSO) has reported a total of 2.21% of disabled population in India and among these, 7.45% were reported to have speech impairments.[22]

Classification

According to the area of phonatory system involved: disorders of voice (dysphonia) are impairments, often occurring due to physical reasons such as involvement of the larynx, speech sound disorders involve difficulty in producing specific sounds such as s, and r, phonetic disorders (articulation disorders) involve difficulty in producing sounds physically, phonemic disorders involve difficulty in learning to distinguish the sound, dysarthria is caused by damage of nerves leading to paralysis of speech, and disorders of frequency. Apraxia of speech can result from stoke or can be developmental in origin. It can be recognized by inconsistent production of speech and reorganizing of sounds in a word. Stuttering, cluttering, dysprosody is a neurological disorder, delayed speech, and muteness is the complete inability of a person to express verbally.[2]

Etiology

The cause of speech and language delays and/or disorders is unknown. Sometimes, however, there can be specific causes. They may include the following.

Hearing loss

Chronic ear infections may result in decreased speech and language skills. When a child has a hard time hearing, he is unable to hear words to repeat them correctly.

Neurological disorder

A child with a neurological disorder may have difficulty coordinating the muscles used for speech or controlling spasms in the tongue area.

Autism

A child with a disorder on the autism spectrum may display developmental problems, including speech and language difficulties.

Intellectual disability

This occurs because of limited cognitive abilities, there may often be delays in speech and/or language skills.

Physical impairment

This may include a cleft lip, cleft palate, or short frenulum (the fold beneath the tongue). These affect the structure of a child's mouth and can limit tongue, lip, and jaw movement for speech production.

Vocal abuse or misuse

This can come from yelling, screaming, excessive throat-clearing, and overuse of the voice.

Extreme environment

A child at risk for developing speech and language problems may come from poverty, have been exposed to drugs or alcohol, have poor nutrition, or experienced neglect and/or abuse, or have experienced one or more of these negative environmental scenarios.

Prematurity

A child born prematurely may have delays in several areas, including speech and language.

Life events

Difficult or traumatic life experiences can 'trigger' stuttering or dysfluent speech in a young child.

Genetics

There are specific genes that are responsible for communication.[23]

Clinical features

It includes repeating or prolonging sounds, distorting sounds, adding sounds or syllables to words, rearranging syllables, having difficulty pronouncing words correctly, struggling to say the correct word or sound, speaking with a hoarse or raspy voice, and speaking very softly.[24]

Oral health status

Children with speech impairment are of great concern as they hamper growth and development. Communication barriers result in mental suffering, abuse related to emotional and physical factors, practical difficulties, and poor social relationships. They cannot maintain their oral hygiene as effectively as can be managed by normal children.[2] So, they show low level of oral health and the common dental diseases found in them are dental caries and gingivitis.[17]

Treatment needs

Increased incidences of caries, poor oral hygiene and periodontal problems are seen in these children. Other dental problems such as spacing, molecules, crossbite and open bite. There is a need for preventive care, restorations, extractions, crowns and pulp care.[20]

Dental management

Generally, children with impaired speech also have impaired hear loss; this should be kept in mind while treating such patients.

Evaluation should be made regarding their speech disorder and assessment the level of impairment.

Make use of nonverbal communication. The dentist must ensure that communication is established at all time during the treatment.

Make sure that child's vision is not hampered and nonobstructive at all time. Any spoken instructions should always be supplied with written instructions so that it is handy for the child. Be sensitive toward the patient and do not make him feel impaired.

If you suspect a speech disorder, make the family aware about it and offer speech therapy by a speech therapist/pathologist.[2]

MENTAL DISABILITIES

Impairments can be seen in motor and sensory functions such as visual loss, hearing impairments, behavioural, attentional, and psychiatric problems are frequent among them.

Classification

Mental disability is a broad concept, PubMed search reveals that most of the studies in this area of interest are done among autism, mental retardation, and Down syndrome.

AUTISM/AUTISM SPECTRUM DISORDER (ASD)

The sensory deficit in children with autism is unable to grade the responses to incoming sensory stimuli appropriately.[25]

Epidemiology

It is estimated that worldwide about 1 in 100 children have autism.[26] It is nearly 4 times more common among boys than among girls.[27] The global estimate for ASD prevalence is 1%, while rates in India are estimated to be 1.5%.[28] In India, boys are more commonly affected by autism than girls, with male to female ratio of approximately 3:1.[29]

Classification

ASD consists of five subtypes: Asperger's syndrome, autistic disorder, Rett's disorder, pervasive development disorder, and childhood disintegrated disorder.

Etiology

Genetic

It includes inherited disorder; X-linked disorder, genes located on chromosomes 2, 7, 15, 16, 19; syndrome such as fragile X, Rett's syndrome, and Down syndrome have been associated with autism; family history of behavioural disorder, communicative deficits impulsiveness, irritability, anxiety disorder, anorexia nervosa; and may be

predisposing factors either of autism in either of the parents.

Prenatal

It includes intrauterine infections such as cytomegalovirus, rubella virus; abnormal brain development during prenatal life, fetal alcohol syndrome; and inborn error of metabolism—phenylketonuria.

Postnatal

It includes unstimulating environment at home; infections such as infantile spasm, herpes, encephalitis; medical conditions such as tuberculosis sclerosis; and lead poisoning.

Environmental

It includes paternal age of more than 40 years is likely to have autism due to age-related alterations in the sperm-producing cells; and pathological parent-child relationship.[2]

Clinical features

It includes social deficits such as absent social smile, poor facial expression, reduced interaction; failure to respond to name, less recognition of faces, lack of pointing fingers; abnormal muscle tone or posture, inactive and disorganized; lack of eye contact; minimal response to his/her name; delayed speech; impaired reciprocation; and preference of isolation even in the presence of other children.[2]

Oral health status

Oral findings reported in them included traumatic ulcerated lesions, auto extraction, as consequence of self-injurious behaviours (SIB). Unusual oral habits include, tongue thrusting, non-nutritive chewing on objects such as gravel or pens and repeated regurgitation.

The most frequently reported dental implications of bruxism in children with autism spectrum disorder include joint pain in the temporomandibular area; excessive wear of the dental enamel; and tooth avulsion. Conditions such as over jets, spacing, Class II molar inclinations and open bites were also highly reported.[30]

Treatment needs

These children rarely communicate and also have a high tolerance to pain; therefore, it becomes mandatory for these children to get biannual evaluations done. Evaluate the dentition for signs of self-injuries such as bruxism, erosion, trauma, and picking of gingiva.[2]

Many factors contributing to poor oral health cannot be controlled but other factors can be controlled such as assisting them in maintaining their oral hygiene, replacing toothbrushes when needed, limiting the intake of snacks between meals, getting the dental check-ups and treatment done on a routine basis.[31] Visual pedagogy will be a useful tool to improve their oral hygiene and they need a lot of restorative dental care.[32]

Dental management

Before the first appointment, it is always advisable to do the groundwork about the child's likes dislikes, trigger zone, expected behaviour, and the detailed history of drugs and comorbidities.

Dentists can desensitize the child by educating them and also letting them know about the procedure in the simplest way.

Make use of behaviour management techniques such as tell-show-do, or modeling.

At all points keep the child aware of what is going to happen next as they hate surprises.

Once the child is seated begin examination just by counting the teeth; discourage the use of instruments and light at the first appointment. Make use of dental mouth prop in order to keep their mouth open.

Use the immobilization technique only when it is necessary and in the interest of the patient, also obtain desired consent before doing that from the parent/caretaker.

MENTAL RETARDATION (MR)

Mental retardation is the most common neuro impairment in children. They show poor sensory integration, which can be because of sensory deprivation or damage to the connecting pathways.

Epidemiology

According to the World Health Organization, globally overall prevalence of mentally retarded children is 1-3%. Mental retardation is considered to be 50 times more prevalent than deafness; 28 times more prevalent than neural tube disorders and 25 times more prevalent than blindness. Prevalence appears to increase with age and more males are identified as compared to females.[2]

Classification

According to degrees of mental retardation, classification is as follows.

Mild (IQ 55-70)

This is also known as the "educable" category. The child appears to be normal, with a pleasant smile, follows

instructions, and complies with it. This is the highest functioning level and the largest category and accounts for approximately 85% of individuals in this category. The children are likely to develop communication and social skills during the preschool years in minimal impairment in the sensorimotor area.

Moderate (IQ 40-55)

This is also known as the "trainable" category. The child again is cooperative pleasant to interact, and tries to follow the command but needs repeated instructions. This is the second-highest functioning level and accounts for approximately 10% of individuals in this category. This group cannot read for information, unskilled and semiskilled work is possible in sheltered environments.

Severe (IQ 25-40)

The children in this category have poor understanding. They are dependent on their caretaker for their basic needs with lower functioning levels. Accounts for approximately 3–4% of individuals in this category. Speaking ability may develop with minimal self-care skills. Skills are limited to simple tasks and sight recognition of "survival" words. Performance of tasks is usually under supervision.

Profound (IQ below 20)

Children cannot understand anything, mainly violent and difficult to control grown-up children. Mental age is below 2 years. This is the lowest functioning level and accounts for approximately 1–2% of individuals in this category.

Underlying neurological deficit usually becomes the reason for a child to come under this category. Training is limited. Continual supervision is necessary.[2]

Etiology

Chromosomal abnormalities

It includes Down's syndrome, Fragile X syndrome, Klinefelter's syndrome (47 XXY), Turner's syndrome, Cat-cry syndrome, Prader-Willi syndrome and de Lange's syndrome.

Prenatal problems

It includes cytomegalovirus infection, toxoplasmosis, herpes, syphilis, Rubella, human immunodeficiency virus, prolonged maternal fever in the first trimester, exposure to anticonvulsants or alcohol, and untreated maternal phenylketonuria.

Perinatal problems

It includes late pregnancy complications, diseases in the mother such as heart and kidney disease and diabetes and placental dysfunction, during delivery (labour) severe prematurity, very low birth weight, birth asphyxia, difficult and/or complicated delivery, and birth trauma, neonatal (first 4 weeks of life) septicemia, severe jaundice, hypoglycemia.

Postnatal problems (in infancy and childhood)

It includes brain infections such as tuberculosis, Japanese encephalitis, and bacterial meningitis. As well as head injury, chronic lead exposure, severe and prolonged malnutrition, and gross under stimulation.

Metabolic disorders

It includes phenylketonuria, hypothyroidism, mucopolysaccharidosis, and sphingolipidoses.

Exposure to certain types of disease or toxins

Exposure to poisons like lead or mercury.

Others include: iodine deficiency (cretinism), and malnutrition.[33]

Clinical characteristics

Children with mental retardation usually look like any other children, but some may have distinct features like - small or large head; small stature; protruding tongue; blunt features; drooling; cannot walk with good coordination.

Behavioural characteristics

Brain damage results in skill deficit, which in turn causes challenges in acquiring age, appropriate behaviours, sometimes even manifesting maladaptive behaviours - slow in response; unable to make decisions; difficulty in completing a task uninterrupted even for a short duration; susceptible to aggressive reaction when demands are not met immediately; difficulty in remembering; difficulty in attending to their self-care needs; difficulty in complying with group game rules or social norms.

Educational characteristics

Delay in development is a characteristic feature such as slow reaction, slow in understanding and learning, poor attention lack of concentration, short-tempered, poor memory, lack of coordination poor motor development, and slow in speech development.[2]

Oral health status

Individuals with MR have poorer overall oral health and oral hygiene compared with the general population. The oral health and hygiene of individuals with MR are associated with the severity and etiology of MR, residential arrangements, and age of the individual. The majority of authors have found that individuals with MR have similar prevalence estimates of dental caries to those

of the general population. Some researchers, however, have found lower prevalence estimates of dental caries among individuals with MR, and others report higher prevalence estimates of untreated caries in this population. Another common oral health problem among children and adults with MR is gingivitis, with prevalence estimates of 1.2 to 1.9 times the estimates of the general population. Some studies on the oral health of individuals with MR, reported prevalence estimates of gingivitis in the range of 60% to 97% among individuals with MR. They found that 33% had bruxism and 20% lacked mastication.[34]

Treatment needs

Gingivectomy may be considered for the patient with drug-induced gingival overgrowth if the tissues interfere with occlusion or oral hygiene. Due to poor oral hygiene, frequent recall examinations and prophylaxis are often indicated as often as every 2 or 3 months. Glass ionomer restorations may be more appropriate for patients with a high caries rate due to fluoride release. Stainless steel crowns may be more appropriate for restoring severely damaged teeth. Endodontic treatment should be considered when a tooth is restorable and the patient can cooperate. Single-appointment procedures are advisable.[2]

Dental management

The dental treatment plan should be formulated according to accepted dental practice and take into consideration the following factors: understanding and communication level, psychological needs, physical limitations, accessibility issues, behaviour management, medical conditions, and antibiotic prophylaxis. A thorough medical history; the patient's mental status or degree of intellectual functioning should be assessed to allow proper communication; the patient's physician should be consulted regarding: timing and dental treatment, patient's physical status, use of restraints or mental abilities, general anesthesia or sedation, potential drug interactions, antibiotic prophylaxis, and existing allergic conditions.[2]

DOWN SYNDROME (DS)

People with Down syndrome tend to have low muscle tone, which can affect how they interpret sensory input coming in through their muscles and joints and they may also experience sensory-related hearing problems.[35]

Epidemiology

Worldwide, the incidence of Down syndrome is estimated to be about one in every 1000 births.[36] It affects approximately 23,000-29,000 children born in India every year with a rate of 1 out of every 830 children being born with Down Syndrome.[37]

Classification

There are three types of Down syndrome.[2]

Trisomy 21

This is the most common type of Down syndrome, with 95% of people with DS having trisomy 21. Here, all your body's cells have three copies of chromosome 21 instead of two.

Translocation Down syndrome

About 3% of people with Down syndrome have this type, where there's an extra part or whole chromosome 21, but it's attached to another chromosome instead of being a separate chromosome 21.

Mosaic Down syndrome

This type of Down syndrome, affects about 2% of the people with the condition, which happens when only some cells in the body have an extra chromosome 21.

Etiology

Down syndrome results when abnormal cell division involving chromosome 21 occurs. These cell division abnormalities result in an extra partial or full chromosome 21.

This extra genetic material is responsible for the characteristic features and developmental problems of Down syndrome.[38]

Clinical features

Though not all people with Down syndrome have the same features, some of the more common features include: flattened face, small head, short neck, protruding tongue, upward slanting eyelids (palpebral fissures), unusually shaped or small ears, poor muscle tone, broad short hands with a single crease in the palm, relatively short fingers and small hands and feet, excessive flexibility, tiny white spots on the colored part (iris) of the eye called Brushfield's spots, and short height.[38]

Oral health status

Oral opening

It includes angle of the mouth pulled down (result of hypotonic musculature), lower lip everted (result of hypotonic musculature), mouth breathing with drooling, chapped lower lip, and angular cheilitis.

Tongue

It includes scalloped, fissured, protrusion and tongue thrusting (result of hypotonic musculature), macroglossia (result of small oral cavity), and desiccated tongue (result of mouth breathing).

Palate

"Stair palate" with "v" shaped high vault soft palate insufficiency.

Dentition status

It includes microdontia, hypodontia, partial anodontia, supernumerary teeth, spacing, taurodontism, crown variants, agenesis, hypoplasia and hypocalcification, reduced risk of dental caries, and delayed eruption.

Periodontal status

It includes increased risk of periodontal disease.

Occlusion

It includes malalignment, frequent malocclusions, frequent temporomandibular joint dysfunction, platybasia, and bruxism.[39]

Treatment needs

Dental professionals should keep in mind that the basic treatment objectives for Down syndrome subjects should be the same as those for normal patients. The overall goal should be to provide as comprehensive treatment as possible, though treatment plans may need to be adapted as necessary due to each individual's condition. Areas of oral healthcare such as orthodontics, prosthodontics, cosmetic dentistry, and reconstructive oral surgery should not be ruled out simply because the patient has Down syndrome.[2]

Dental management

It is essential to obtain and review a patient's medical history before the dental appointment and it is quite essential to consult the pediatrician, physician, and caregivers.

They might need aggressive management of acute necrotizing ulcerative gingivitis and other oral infections.

The importance of using fluoride to prevent dental caries associated with xerostomia should be stressed.

Either the patient or the caregiver should be educated regarding the prevention of oral infections with regular check-ups and daily oral care.

Information about the frequency of seizures and the medications used to control them should be recorded before the appointment by consultation with the physician and the factors that trigger the Down syndrome patient's seizures should be identified and avoided.

If a seizure occurs during the dental procedure, dental instruments, if at all, are to be taken out from the oral cavity and the surrounding area around the dental chair should be quickly cleared. Rubber dam clamps and mouth props should be tied with dental floss before treatment begins. This will help to remove them quickly. Dental professionals should turn the patient to one side and monitor the airway to reduce the risk of aspiration.[2]

CONCLUSION

Children with sensory deficits pose a special challenge to dental professionals, primarily because of issues with proper communication and they are at an increased risk of developing oral diseases because of poor access to dental care facilities. These children are primarily dependent on parents/caregivers for the maintenance of oral hygiene and are not. Dental infection and early loss of teeth are more prevalent especially in this group of children because of a lack of adequate knowledge of oral health care and negligence in maintaining appropriate dental care. This signifies an unmet backlog of treatment needs among this population and necessary initiatives should be taken by dental healthcare professionals to deliver appropriate oral health care to these children. The intervention program is much needed for these groups of subjects involving voluntary health agencies. Efforts must be taken to encourage and promote the parents of these children to improve their oral health.

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