Sheet no: 8

Oral health and management of children with systemic diseases

**Down syndrome**

Prevalence 1:600 birth \*it’s the most frequently occurring chromosomal disorder.

General manifestation :

1. Mental retardation from mild to sever
2. Chronic infection are common specially the respiratory tract infection
3. Dry skin
4. Cardiac disease 50 %
5. Leukemia is very common
6. Compromised immune system
7. Visual and auditory problems

Craniofacial characteristic :

1. Brachycephaly (Flat skull posteriorly ) . 2- under developed face and retruded .

3- upward slanting eyes . 4- small ears

Oral manifestation :

1- maxilla is small \*class3 malocclusion is common \*

2- tongue is large, protruded, fissured with poor tone\* all the oral muscle has poor tone\*

Teeth :

Delay eruption and exfoliation , eruption doesn’t follow the normal sequence

Congenital missing teeth is common – enamel hypoplasia

\* hypodontia microdontia enamel hypoplasia

High risk of periodontal disease also the periodontal disease is rapidly progressing sever periodontal break down horizontal bone loss

***Consideration for dental treatment:***

1. Difficult **access for dental services**. Limited physical access ( down syn children have auditory and visual problem)
2. Limited practitioner willingness to provide care
3. Lack of practitioner knowledge and confidence to treat patients with down syndrome
4. the financial burden.

The second problem is **communication**, most of patients with down syndrome have mental retardation ranging from mild to severe, they may have hearing or visual disability or speech problems, so we use **\*\* non verbal communication \*\* simple language \*\* provide one concept at the time** , sometimes these children can be managed at the dental clinic but most of the time we go for general anesthesia or sedation to manage these patients specially if there dental needs are multiple .

For the **behavioral management**, you use **the tell show do technique** but be careful if these children cannot see, so use the tell feel and do. We have to keep the appointment as short as possible. General anesthesia and sedation are options if other behavioral management approaches didn’t work , however the general anesthesia is very dangerous because patients with down syndrome are prone to respiratory tract infections, and its difficult to do intubation because there neck is short and there tongue is large, there nasal passages are usually obstructed, and they also have something called Atlanto axial instability (read about it) its something special and unique to patients with down syndrome and it makes general anesthesia a real risk.

And for the **cardiac status**, 50% of down syndrome patients have cardiac problems, so there is always a risk of infective endocarditis, there is always a need for prophylactic antibiotic, and this indicates the importance of excellent oral hygiene so not to endanger the patient.

And now for the **periodontal diseases**, Why patients with down syndrome are more prone to periodontal diseases?

1) The periodontal pathogens can colonize in the early childhood in patients with down syndrome, so if we took a normal patient and a patient with down syndrome, you can clearly see that these pathogens colonize more in patients with down syndrome.

2) Also because of their compromised immune system. They have reduced chemotaxis of the WBC’s, they have diminished phagocytic ability, deficient T cell function and abnormal bacteriocidal activity. And as you know these form the first line of defense against any infection. So when all of them are defective this means that the child is going to be more prone to the disease. The bacteria is present and the immune system is not effective .

3)poor oral hygiene, the manual dexterity is also poor, in addition to that the plaque is accumulating and the bacteria is increasing and the open mouth posture and mouth breathing, because as we said before, the muscles of the facial expression and the masticatory muscles have poor tone so usually we have open mouth posture, this means breathing through the mouth this will lead to xerostomia which will reduce the cleansing capacity of the saliva. So these factors are the reason why patients with down syndrome are more prone to periodontal diseases.

For the **dental caries**, patients with down syndrome have LOW levels of caries **(low caries prevalence**) , because they have higher salivary pH, and higher salivary bicarbonate levels, low streptococcus mutans counts, (microdontia- hypodontia- spaced dentition)that lead to decrease the accumulation of plaque, delayed eruption, shallow fissures in premolar and molar . So all these factors will reduce the prevalence of caries, however several dietary habits can lead to rapid progression, and we never consider patients with down syndrome a low caries risk, **they are always a HIGH risk of caries** even though they have these factors , they are still considered as high caries risk, why? Because they are given a nursing bottle to take to bed, they are weaned off the bottle at an older age, they are given less parental health with oral hygiene, usually the parents are overwhelmed with other conditions that the child has, they are given syrup medications for repeated respiratory tract infections. All of these factors means that these children will develop caries sooner or later. So intense oral hygiene instructions and the high caries risk protocol should be followed up with patients with down syndrome.

For the malocclusion, children with down syndrome has posterior and anterior crossbites, anterior open bite and incisal class 3, and the feasibility of the orthodontic treatment depends on the severity of the malocclusion, ability to cooperate with treatment, ability to cope with appliance, and the effect of oral musculature on possible relapse after treatment. So all these factors should be considered before starting orthodontic treatment.

***Dental management:***

* Early contact with the dental team as early as 6 months but no later than 18 months of age.
* Regular dental visits are very important
* Developing a preventive program including regular periodontal treatment and monitoring.
* Oral hygiene instructions to the patient and the parent
* Advice regarding the use of antimicrobial agents.
* Appropriate dietary management.
* Use of sugar free medications as possible so we can reduce the risk of caries.

\*\*\*\* usually we can treat down syndrome patient in the dental chair

***Autistic spectrum disorder (ASD):***

This is a relatively new condition, it was first described in 1943, it is characterized by abnormal emotional and social behavior and linguistic development. It occurs in 2-15 : 10000 live births with males more commonly affected, and it is usually diagnosed before 3 years of age, and usually the parents are the first to recognize this condition.

For the ***diagnostic criteria*** ( 3 main things that has to be present in the child to confirm the diagnosis):

1. Restricted stereotypical behavior (repetition) (repeats movements that is obvious)
2. Qualitative impairments in social interaction (the child doesn’t interact with surrounding people)
3. Qualitative impairments in communication (language) (child doesn’t develop language – late in speech- )

ASD has no distinctive facial features you can’t know unless the patient starts to interact, no eye contact for example.

For the ***etiology***, the exact etiology of autistic spectrum disorder is yet not known. However, they believe that there is an interaction between **genetic vulnerability and prenatal insults /trauma** . This is the proposed etiology but its not definitive.

For the ***inheritance***, its not a must that one of the parents has ASD so the child will be affected, it may be related to low IQ of the father or mother, or delayed speech in the mother or father , or anything in the history of the parents that indicates they have something abnormal in brain function can lead to autism in their children.

***Oral health status and dental needs of children with autism:***

More authors find caries susceptibility and prevalence of periodontal disease is not different from non autistic individuals and maybe even lower. But several factors might increase caries risk:

1. Soft and sweet food preference (as we said they tend to repeat, not only for movements, but also if they liked something they stick to it, and if they like something they like it to the most, so if they like sweet food they will stick to it) so the eating habit determine the caries risk
2. Poorer masticatory abilities

Food pouching (they keep food for long time in their mouth )

All these factors increase the risk of dental caries.

***Challenges to the dental team:***

* Reduced ability to communicate
* Uneven intellectual development
* Repetitive body movements
* Hyperactivity and limited attention span
* Tactile and auditory hypersensitivity and may have exaggerated reactions to light and odors
* Self injurious behavior (they have high threshold to pain so they can injure their selves without feeling)

***Clinical management considerations :***

* AD is a heterogeneous disorder (ranges from mild to severe)
* Communicative behavior management doesn’t always work
* Desensitization
* Gradual and slow exposure to the dental environment
* Appointment structure ( our appointment depend on the patient routine **we don’t break their routine** we should know when the patient wake and sleep make the the appointment in the time that good for the patient )

It is very important that the patient with autism to see the same faces every time the same dentist , hygienist, the same nurse because they like repetition. So in mild cases they can be treated in the dental clinic, but in more severe cases we tend to go for general anesthesia.

***Attention Deficit Hyperactivity Disorder (ADHD):***

The prevalence increase , the etiology is unknown

It is a neurodevelopmental disorder characterized by a definite behavioral pattern that might impair the affected individual’s performance in the social, educational, or work environments.

***The characteristics of this condition:***

1. Inappropriate levels of inattention.
2. Hyperactivity and impulsivity.
3. Inability to pay attention to details.
4. Difficulty organizing tasks.
5. Restlessness or inability to remain sitting in appropriate situations.

Regarding the ***etiology*** of ADHD , it is also a combination of genetic and environmental factors that alter the developing brain, resulting in structural and functional abnormalities.

Neuroimaging studies indicate that ADHD is a result of abnormal anatomical functioning and connectivity in certain parts of the brain, which means the patient, has genetic vulnerability in addition to environmental insults which leads to actual damage in the brain. For the environmental insults it could be due to maternal mental disorders, violence, stress, smoking, and drinking alcohol in the prenatal period, premature birth also might be an environmental insult in ADHD.

For the ***diagnosis***, there is no biological marker or a test that tells you that this child has ADHD, it is based on the child’s clinical history and the effect of the behavioral symptoms on their network of relationships so the diagnosis is complemented by the neuropsychological assessment or neuroimaging of the brain or MRI or CT scan of the brain that will indicate the actual damage in the brain of children with ADHD.

***ADHD challenges:***

ADHD was to be related with a higher frequency of non-cavitated caries lesions at the age of 10 years, a study was done on ADHD children and the result was high levels of caries, but was it related to ADHD or to the factors that lead to ADHD such as violence, stress, smoking, … so the association is not clear, we don’t know if it’s related directly to the ADHD or to the factors that caused ADHD. ADHD might be associated with higher levels of MIH.

***ADHD dental management considerations:***

* Usually these children are difficult to treat in the dental clinic because of their continued movement.
* Behavioral management techniques might be effective but in general they are very difficult to handle.
* Nitrous oxide sedation might be beneficial and sometimes general anesthesia is the last resort to treat these children especially if their dental needs are extensive.

***Congenital Heart Disease (CHD):***

It is very common, and we define it as a defect in the structure of the heart and great vessels that is present at birth, the kid is born with this problem. **Children with CHD are at increased risk of developing oral disease, and are at increased risk from the systemic effects of oral disease**, it’s a very important information and it doesn’t only apply to CHD, it applies to all medical conditions in children. They are more prone to develop caries , their medical condition will increase their risk to caries, and the caries will be dangerous.

***Challenges for the dental team:***

* Lack of awareness of the importance of oral health by their families.
* Family is usually overwhelmed with the cardiac condition so they don’t pay attention to dental caries.
* The need to gain weight prior to cardiac surgery.
* They take sugar based medications.
* Dental anxiety due to previous hospitalization (white coat syndrome).
* Sometimes it could be associated with other syndromes that make these children difficult to treat in the dental clinic for example mental retardation.
* Dental defects of developing dentition.
* There is always a risk of developing infective endocarditis.

Remember \*\*\* the condition that need prophylactic antibiotic : prosthetic cardiac valve and congenital heart disease and previous infective endocarditis

\*\*\*\* all the dental procedure that involve manipulation of gingival tissue and oral mucosa need antibiotic prophylactics other than that like routine anesthetic injection, take dental radiograph, placement of removable prosthodontic/ orthodontic we don’t give prophylactic antibiotic .

***CHD dental management:***

Consult family medical practitioner or cardiology team. Ideally, We should have a very good level of awareness, and to see the child as soon as possible in the first 6 months, we may have no teeth but it is very important to talk to parents about what to expect and to give them the needed advice and to make them aware of the importance of oral health**. Prevention** is number one , definitive treatment is preferable to temporary or short-medium term solution ( we remove the source of infection )extraction is preferable more than pulpotomy . Poor prognosis of first permanent molars (FPM’s) we extract them immediately we don’t need to keep those teeth, the life of the child is more important than restoring and maintaining a poor prognosis FPM.

non pharmacological behavioral management vs. sedation or general anesthesia. We can use both \* we don’t have any risk from GA to the children with CHD \*\*

***Asthma*** :

Is a chronic inflammatory disorder, manifesting with episodes of chest tightness, coughing, shortness of breath and wheezing. Medications includes bronchodilators and anti-inflammatory agents some pt take cortisone .

***Oral and dental health of children with asthma:***

* They have reduced salivary flow related to the medications they take.
* Increased caries risk associated with the reduced salivary flow.
* Gingivitis
* Erosion.
* Candida.
* orofacial abnormalities including increased facial height, higher palatal vaults, greater overjet and higher prevalence of crossbites (( this due to mouth breathing ---tongue become in lower position – over eruption of posterior teeth ---inward movement if the lower jaw )).

***Management of asthma:***

Management is easy and straight forward, the most important thing that they have the inhaler with them, if It is with them then its safe. However you should ask the parents what trigger the asthma such as anxiety or stress, so you have to know all the factors that trigger the attack and avoid it, in addition to the presence of bronchodilator or corticosteroid to be in the safe side.

Slide 8 part 2 the doctor was just reading the slide ☺

Extra note :

Scoliosis : abnormal curvature of the spine

\*\*\*\*\*\* Its better to treat cerebral palsy pt in the dental clinic \*\*\*\*\*\*\*

**Good luck**