Pediatric Dentistry

5th Year

Lec. 4 (A.M.)
Management of Children with Systemic Diseases

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Management of Children with Systemic Diseases

Systemic disease in children cover a wide range of conditions, which include diseases involving one or more organs or systems of the body, thereby affecting the general health of the child.

A number of systemic conditions affect the oral tissues and require modifications during routine dental treatment. The systemic disease may have a profound effect on the health of the oral tissue and vice versa. For examples:

- Oral manifestation of systemic disease(glossitis seen in anemia)
- Systemic condition might increase the risk of oral disease (dental erosion seen in a child with anorexia nervosa).
- Medication used for the treatment of the systemic disease might increase the risk of oral disease (gingival hyperplasia on administration of Dilantin).
- Oral disease may pose a greater risk for the child to develop systemic disease (bacteremia from odontogenic infection in bacterial endocarditis).

ENDOCRINOPATHIES

Hyperthyroidism

Patients with Hyperthyroidism are of a great concern to the dental surgeon. In children with untreated or poorly treated thyrotoxicosis, dental treatment, infections or trauma can precipitate an acute emergency called thyroid crisis or thyroid storm.

Causes of thyrotoxicosis

Ectopic thyroid tissues
Graves' disease (Appears to be due to an autoimmune disorder in which a substance is produced that abnormally stimulates the thyroid gland)
Multinodular goiter
Thyroid adenoma
Pituitary gland disease

Note: Thyroid hormones are important for metabolic functions that are involved with utilization.

Thyrotoxicosis means increased amount of thyroid hormones, thyroxine and triiodothronine in blood.

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Oral manifestations in children

Premature loss of primary teeth and early eruption of permanent teeth.
Early development of the jaw bones.
Increased periodontal disease.

Management in the dental clinic

- Consultation with child's physician.
- Avoid elective dental treatment until thyrotoxicosis is under control.
- Acute infections must be dealt with antibiotic therapy to prevent thyroid crisis.
- Avoid use of adrenaline and other vasoconstrictors.
- Thyroid storm may be precipitated due to trauma, surgery, stress, or infections. Early recognition and management is important. It includes ice applied on skin, intravenous administration of hydrocortisone, glucose, etc. and cardiopulmonary resuscitation, if required.
- Patients under good medical control can be managed as normal.

Hypothyroidism

It does not manifested as sever, life-threating condition and in children it is called **cretinism**.

Oral manifestations

Delayed eruption of teeth
Malocclusion
Enlarged tongue

Hyperparathyroidism

A lower level of calcium level stimulates release of parathyroid hormone which:
Increase bone resorption.
Retains calcium by reabsorption in the kidneys.
Favors absorption of calcium in the intestine.

The net effect is increased serum calcium level which inhibits further parathyroid hormone secretion.

Oral manifestations

- Drifting and loosening of teeth
- Malocclusion
- Pathological fracture of jaw bones
- Radioluscencies representing bone cysts (osteitis fibrosa cystica), loss of lamina dura
- A generalized ground glass or moth eaten appearance of bone may be seen.

Management in the dental clinic

- Consultation with child's physician.
- Determine serum calcium, phosphate and alkaline phosphatase level.

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- Avoid routine dental treatment in patients with severe renal failure. Emergency dental treatment must be provided with proper medical advice.
- Dental treatment of malocclusion, missing teeth... etc. should be done after the treatment of the cause of hyperparathyroidism.

Hypoparathyroidism

Commonly seen following surgical procedures involving thyroid gland and inadvertent excision of parathyroid gland (damage to the gland during surgery). Severe cases of hypoparathyroidism may lead to tetany.

Oral manifestations

Hypoplasia of teeth

Blunting of molar roots

A sharp tap over the facial nerve in front of the ear causes twitching of facial muscles around the mouth (Chvostek sign).

Management in the dental clinic

- Consultation with child's physician.
- Avoid elective treatment in case of severe hypocalcemia with serious cardiac problems.

Diabetes Mellitus

It is a disease complex of disordered metabolism characterized by hyperglycemia, altered protein and lipid metabolism as a result of absolute or relative deficiency of insulin. Clinically it can be classified as:

Insulin dependent mellitus

Non-Insulin dependent mellitus

Symptoms of Diabetes Mellitus:

Excessive thirst	Fatigue and tiredness	Others general symptoms
• patients may drink huge volumes of fluid • cause more urine will be produced and making the person thirstier as a result.	• Because of imbalance of sugar level in blood.	• urinating a lot • losing weight • having blurried vision

Other symptoms include:

Recurrent bed wetting, Repeated skin infections, Marked irritability, Headache, Drowsiness, Malaise, Dry mouth

Oral manifestation:

1) Gingivitis, increased severity of periodontitis, bone loss, periodontal abscess, etc.
2) Xerostomia
3) Delayed wound healing
4) Pulpitis in non-carious tooth

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5) Burning sensation in tongue
6) Acetone smell in breath
7) Oral ulcers
8) Oral candidiasis
9) Increase the susceptibility to dental caries (due to xerostomia and increase saliva glucose)
10) Miscellaneous conditions such as:
Neuropathies: may affect cranial nerves (facial).
Drug side-effects: lichenoid reaction may be associated with sulphonylureas (chlopropamide)
Ulcers

Management in the dental clinic

To minimize the risk of an operative emergency, clinicians need to consider some issues before initiating dental treatment:

- ✓ **Medical history**: Take history and assess glycemic control at initial appointment, by:
- ✓ Glucose levels
- ✓ Frequency of hypoglycemic episodes
- ✓ Medication, dosage and times.
- ✓ Consultation

1. Scheduling of visits:
   Morning appointment
   Do not coincide with peak activity.
3. **Diet:**
   Ensure that the patient has eaten normally and taken medications as usual
4. **Blood glucose monitoring:** Measured before beginning. (<70 mg/dL)
5. **Prophylactic antibiotics:** To get rid of the establishment of infection.
6. **During treatment:** The most common complication of DM occur is: Hypoglycemic episode.
   Hyperglycemia
7. **After treatment:** Dietary intake
   Medications: salicylates increase insulin secretion and sensitivity ➔ avoid aspirin

MANAGEMENT OF SYNCOPE:

Treat the underlying cause
Immediate symptomatic therapy includes:
Recognition of unconsciousness
"Shake & shout"
Check for protective reflexes

Management

Position victim-supination
Assess & open airway-head tilt, chin lift
Airway patency, breathing, circulation-look, listen & feel
Artificial ventilation & cardiac massage-cardiopulmonary resuscitation

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Cystic fibrosis

It is an autosomal-recessive disorder occurring in 1 of every 2000 births. It is the most common lethal genetic disorder affecting whites. The genetically altered protein affects exocrine gland function. The defective exocrine gland function leads to microobstruction of the pancreas, which results in cystic degeneration of the pancreas and, ultimately, a digestive enzyme deficiency producing malabsorption of nutrients.

The defective gene products cause abnormal water and electrolyte transport across epithelial cells, which results in a chronic disease of the respiratory and gastrointestinal system, elevated levels of electrolytes in sweat, and impaired reproductive function. In the lungs, retention of mucus occurs, which causes obstructive lung disease and increased frequency of infections.

Children with cystic fibrosis have a high incidence of tooth discoloration when systemic tetracyclines are taken during tooth formation. With the advent of alternative antibiotics, the incidence of tooth discoloration is decreasing.

The incidence of dental caries in children with cystic fibrosis is low secondary to long-term antibiotic therapy, buffering capacity of excess calcium in the saliva, and pancreatic enzyme replacement therapy.

There is a high incidence of mouth breathing and open-bite malocclusion associated with chronic nasal and sinus obstruction.

Patients with cystic fibrosis may prefer to be treated in a more upright position to allow them to clear secretions more easily.

The use of sedative agents that interfere with pulmonary function should be avoided, and the patient's physician should be contacted before nitrous oxide–oxygen sedation is used in a patient exhibiting evidence of severe emphysema.

Dental management of cystic fibrosis

- Those children suffer from delayed dental development, more commonly have enamel opacities and are more prone to calculus
- They need to have higher caloric intake and may have frequent refined carbohydrate snacks –
- May also have cirrhosis of liver -> clotting defects -> haemorrhaging following surgical procedures
- May be prescribed tetracycline to prevent chest infections -> intrinsic dental staining
- General anaesthesia should be avoided

Renal disease

In renal disorders there is increased susceptibility to:

Infection and immunosuppression, bleeding tendency, decreased ability to excrete drugs, existence of A-V shunt, cross infection.

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Dental management of renal disorders:

- Prevent dental diseases- OHI and education
- Strict cross-infection control
- Consult patient's physician before performing dental treatment
- Monitor BP pre-op and post-op
- Treat all infections aggressively and consider prophylaxis
- Use additional hemostatic measures
- Be careful with prescribing drugs
- Never subject those patients to out-patient general anaesthesia
- Remember veins are precious
- Poor bone density -> frequent denture adjustments
- Try to perform dental treatment just after dialysis if possible

Oral Manifestations of Renal Disease and Dialysis:

Enlarged (asymptomatic) salivary glands i.e. Parotitis
Decreased salivary flow, Xerostomia
Dry mouth
Odor of urea on breathe, ammonia like taste and smell
Metallic taste
Increased calculus formation
Low caries rate
Enamel hypoplasia
Extrinsic (secondary to liquid ferrous sulfate therapy), dark brown stains on crowns
Intrinsic (secondary to tetracycline staining)

Note: Chronic renal failure is the irreversible deterioration in renal function which results from a diminished mass of the excretory, metabolic and endocrine functions of the kidney which leads to the development of the clinical syndrome of uremia, so:

UNDER CONSERVATIVE CARE

- Consultation with patient's physician
- Check lab values, blood urea nitrogen
- Avoid dental treatment if the disease is unstable.
- Monitor blood pressure closely
- Pay meticulous attention to good surgical technique
- Avoid nephrotoxic drugs
- Adjust doses of drugs metabolized by the kidney
- If medical parameters permit:
  - Try to eliminate all foci of infection
  - Keep only the easily maintainable teeth
  - Insist on keeping a good oral hygiene

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- If patient is in advance stages, dental care may best be provided after physician's consultation and in a hospital like setting
- Because of the potential bleeding problems:

1. Pretreatment screening for bleeding time and platelet count PTT, PT, platelet count.
2. A hematocrit level and hemoglobin count should be obtained to assess the status of anemia.
   - If an orofacial infection exists, aggressive management is necessary using culture and sensitive tests and appropriate antibiotics. Consider corticosteroid supplementation as indicated.

NEPHROTOXIC DRUGS:

Tetracyclines, Streptomycin, Vancomycin, Gentamycin, Acyclovir, Acetaminophen Phenacetine, NSAIDs, Asprin, Antihistamines, Phenobarbitones

Therefore, you should give:

Cloxacillin, erythromycin, minocycline, codiene, diazepam, lidocaine.

PATIENT RECEIVING DIALYSIS

Those patients at high incidence of serum hepatitis, high incidence of anemia, significant incidence of secondary hyperparathyroidism, uremic stomatitis may exist, may undergo heparinization during hemodialysis, and may have arteriovenous shunt or fistula. So keep in mind:

- The work will be the same as conservative care conditions
- Beware of concerns of arteriovenous shunt
- Consult with the physician about risk for infective endocarditis
- Avoid blood pressure cuff and IV medications in arm with shunt
- Avoid dental care on day of treatment; best to treat on day after
- Consider antimicrobial prophylaxis
- Consider corticosteroid supplementation as indicated
- Assess status of liver function and presence of opportunistic infection in those patients because of increased risk for carrier state of hepatitis B and C viruses and human immunodeficiency virus.

Dental management

1-Screen for HBsAg and HBsAb
2-Antibiotic prophylaxis to prevent endarteritis of arteriovenous fistula
3-Prevent hypoxia
4-Provide treatment on the day after hemodialysis
5-Be careful to protect the fistula or shunt when patient on dental chair
6-Refer the patient to physician if uremic stomatitis is noted to develop

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Renal transplant patient

Infection in such patients is life –threatening. Before transplantation only maintained teeth should be determined by dental team approach, however, teeth with furcation involvement, periodontal abscesses, or extensive surgical requirements should be extracted.

Dental management

1- Emergency treatment only for 1st 6 months
2- HBs Ag screening
3-Prophylactic antibiotics according to AHA recommendations
4- Erythromycin is contraindicated in patients on cyclosporins
5- Immunosuppressed patients requires supplemental corticosteroids.

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