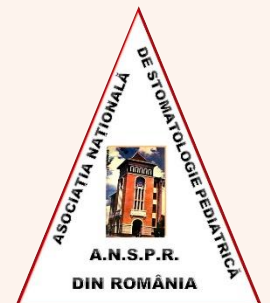




*the Child Dental Patient with*

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# *Diabetes mellitus*



# Diabetes Mellitus (DM)

- High blood levels of sugar (hyperglycemia) – fasting glycemia above 126 mg/dL (7.0 mmol/L)
- Usually diagnosed in childhood, but may occur at any age

- **Type 1 DM** (insulin-dependant)

- primarily found in children
- currently affects approx. 500000 children under 15 years of age worldwide

- **Type 2 DM** (insulin-insensitive)

- since the 1990s - increasing prevalence, associated with higher rates of obesity and overweight in children and adolescents



# Type 1 DM – most common DM type in children

**Incidence:** 0.1 to 37/ 100.000 per year and increasing

**Ethiology:** autoimmune destruction of the insulin-producing  $\beta$  cells of the pancreas

**Symptoms:** polyuria  
polydipsia  
weight loss despite appetite  
ketoacidosis

**Prone to:** infections; impaired wound healing  
autoimmune diseases (Grave's disease,  
Hashimoto's thyroiditis, Addison's disease)



# DM-related oral features in children (1)

- **Periodontal inflammation** – gingivitis, periodontitis, calculus; increase with age

Hyperglycaemia damages periodontal tissues through several mechanisms, primarily due to the damages of the mechanism of immune response, non-enzymatic glycosylation and increased oxidative stress

- ▶ DM is not the direct cause, but a **predisposing condition** for periodontal disease due to various pathogenic mechanisms:

- metabolic imbalance of tissues (lowers immune response and resistance to infection)
- micro vascular disease
- changes in the composition of the gingival crevicular fluid
- increased presence of periodontal pathogenic microorganisms
- genetic predisposition
- non-enzymatic glycosylation
- increased oxidative stress

# Relationship between periodontal status and DM

Higher risk

Children with DM and periodontitis

deterioration of glycaemic control over time

more severe form of periodontitis

children with type 1 DM and poor metabolic control

Higher risk

## DM-related oral features in children (2)

- **Dental development** can be modified - accelerated until the age of 10 y, then delayed, with longer edentulous intervals
- **Tooth eruption** - accompanied by high ratio of gingival inflammation.
- **Caries** - not consistently related to DM, but rather to poor medical and oral care

## DM-related oral features in children (3)

### ● Saliva

- reduced secretion (xerostomia)

  - increases likelihood of caries, BUT good metabolic control prevents the most dangerous salivary changes (high glucose, low pH)

- higher levels of Calcium → calculus

- lower pH and buffering capacity

- increased peroxidase activity, glyucose and Magnesium

# Oral care for the child with DM – **FOCUS** on:

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- Prevention: diet & oral hygiene control – control of biofilm → control of periodontal status
- **! EDUCATION:** - correct brushing  $\geq$  twice/day
  - floss
  - chlorhexidine digluconate 0.2% when needed
- Primary care – early management and control of gingival/periodontal status
- Immediate symptomatic relief of oral manifestations of the disease
- Interdisciplinarity – paediatric dentist & paediatric endocrinologist (Periodontitis treatment protocol **MUST** involve local periodontal mechanical treatment as well as local and systemic medication treatment)





# Important for the paediatric dentist (1)

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- Take thorough history of DM and previous dental experience
- Schedule appointments preferably in the morning, after breakfast
- Short appointments, stress-free, non-traumatic
- Conscious sedation if needed (rather than deep sedation)
- Insulin adjustment by diabetologist if needed (especially when fasting is recommended for dental procedures)



## Important for the paediatric dentist (2)

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- Avoid pulpotomies/pulp capping when possible (→ avoid potential complications of partial vital techniques)
- Infected non-vital teeth – to be extracted
- Avoid stressful extractions
- Have a glucose source readily available in office for potential hypoglycemic accidents



## Important for the paediatric dentist (3)

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- Use anaesthetics with vasoconstrictors BUT carefully – excess of ardenaline may cause increase of blood sugar levels
- Consider AB prophylaxis before surgical procedures
- Avoid salicylates, as they increase insulin secretion and enhance the effects of sulfonylureas → hypoglycemia



# Important for the orthodontist

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- Orthodontic treatment planning must take into consideration the periodontal status
- Interceptive treatment – early assesment
- Removable appliances when possible – easier to maintain proper periodontal hygiene



## DIABETES and ORAL HEALTH - Key points (\*)

- People with poorly controlled diabetes (both type 1 and type 2 diabetes mellitus, both adults and children) must be considered at risk for periodontitis, and people with diabetes should be informed of this risk.
- Early diagnosis and prevention are of fundamental importance to avoid the largely irreversible tissue loss that occurs in periodontitis, and early referral of adults and children with poorly controlled diabetes to dental clinicians is indicated for periodontal screening.
- Periodontal therapy in patients with diabetes is associated with improvements in glycaemic control (HbA1c reductions of approximately 0.4%) that may be clinically relevant in the management of diabetes.
- Oral health should be promoted in people with diabetes as an integral component of their overall diabetes management.
- Closer collaboration between medical and dental clinical teams is necessary for the joint management of people with diabetes and periodontitis, and contact with dentists is important after the diagnosis of diabetes.

(\*) From: Preshaw PM, Alba AL, Herrera D, Jepsen S, Konstantinidis A, Makrilakis K, Taylor R. Periodontitis and diabetes: a two-way relationship. *Diabetologia* (2012) 55:21–31 DOI 10.1007/s00125-011-2342-y