



# Diabetes type 1

## Clinical Management (1) -Standards of care & Challenges-

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# Diabetes type I- Introduction



- T1D is a multi-system disorder with immune mediated destruction of beta cells in pancreatic islets.
- The peak of onset is puberty after the presentation of weight loss, polyuria and thirst.
  - In adults mainly weight loss and lethargy.

# Diabetes type I- Introduction



- May also present as acute medical emergency (DKA).
  - Precipitated by intercurrent infection
  - Nausea, anorexia, vomiting and abdominal pain, **may lead to electrolyte imbalance and death in severe cases.**
- The aim is to **prevent DKA** and maintain near **normal glucose values**

# Diabetes type I- Introduction children and adolescents



- $\frac{3}{4}$  of all cases of T1DM are diagnosed in patients <18 yrs.
- **Providers must consider many unique aspects to care of children & adolescents with T1DM:**
  - Changes in insulin sensitivity related to physical growth and sexual maturation.
  - Ability to provide self-care.
  - Supervision in the child care and school environment.



# Diabetes type I- Introduction children and adolescents

- Neurological vulnerability to hypoglycemia and hyperglycemia in young children.
- Possible adverse neurocognitive effects of diabetic ketoacidosis
- **Attention to family dynamics, developmental stages, and physiological differences related to sexual maturity**

# Diabetes type I- Management basics



- Multidisciplinary team is needed.
  - Dietitian
  - Diabetes nurse
  - Physicians
  - Psychologists.
- Control reduce complications.
  - Intensive therapy is better than conventional therapy for preventing complications

# Diabetes type I- Management basics



- Management of type 1 diabetes comprises a package of measures including:
  - Multiple daily injections.
  - Assessment of glycaemic control
    - **blood glucose self-monitoring**
    - glycated haemoglobin (HbA1c)
  - Insulin dosage adjustment according to diet and exercise
  - A healthy diet and carbohydrate counting
  - **Intensive diabetes education.**
  - **Psychosocial support.**



# Type 1 Diabetes: DSME & DSMS



- **Patients /parents/caregivers should receive culturally sensitive & developmentally appropriate individualized DSME and DSMS.**
- Family involvement is a vital component of optimal management in childhood.
- Diabetes care team must be capable of evaluating the educational, behavioral, emotional, and psychosocial factors that impact implementation of a treatment plan
- **And must work with the individual and family to overcome barriers or redefine goals as appropriate.**



# Type 1 Diabetes: Psychosocial Issues



- At diagnosis and during routine follow-up care, assess **psychosocial issues and family stresses** that could impact adherence to diabetes mgmt.
- Provide referrals to trained mental health professionals if needed.
- Encourage family involvement in diabetes mgmt. tasks for children & adolescents

# Type 1 Diabetes: Psychosocial Issues



- Mental health professionals should be considered integral members of the pediatric diabetes multidisciplinary team.
- Providers should assess diabetes distress, social adjustment, and school performance to determine whether further intervention is needed.
- Adolescents should have time by themselves with their care provider(s) starting at age 12 years.

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# Type 1 Diabetes: Glycemic Control



- An A1C goal of  $<7.5\%$  is recommended across all pediatric age-groups
- Current standards reflect the need to lower glucose as safely as possible.
- **Special consideration should be given to the risk of hypoglycemia in young children (aged  $<6$  years)**
  - who are often unable to recognize, and/or manage their hypoglycemic symptoms.

**-individualized glycemic targets-**

# Type 1 Diabetes: Glycemic Control



Blood glucose goal range		A1C	Rationale
Before meals	Bedtime/ overnight		
90–130 mg/dL (5.0–7.2 mmol/L)	90–150 mg/dL (5.0–8.3 mmol/L)	<7.5%	A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypos

- 1. Goals should be individualized; lower goals may be reasonable.**
- 2. Modify BG goals in youth w/ frequent hypos or hypoglycemia unawareness.**
- 3. Measure postprandial BG if discrepancy between preprandial BG and A1C & to assess glycemia in basal–bolus regimens.**

# Type 1 Diabetes: other considerations



- Assess for the presence of **autoimmune conditions** associated with type 1 diabetes soon after the diagnosis and if symptoms develop.
- Consider testing for **Autoimmune thyroid disease**.
- Consider screening for **celiac disease** soon after diagnosis.
- Also in individuals who have a first degree relative with celiac disease, growth failure, weight loss, gastrointestinal symptoms or in children with frequent unexplained hypoglycemia or deterioration in glycemic control.

# Type 1 Diabetes: other considerations



- **Hypertension (HTN)** → Measure BP at each routine visit.
  - Treatment for high blood pressure; diet, exercise & weight control.
  - If target blood pressure is not reached with 3–6 months of consider pharmacological treatment

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# Type 1 Diabetes: other considerations



- **Dyslipidemia** → Obtain a fasting lipid profile in children  $\geq 10$  years soon after diagnosis
  - If lipids are abnormal, annual monitoring is reasonable.
  - Initial therapy: Optimize glucose control & MNT.
  - Statins might be considered.
- **Smoking** – CVD risk

# Type 1 Diabetes: other considerations



- **Nephropathy:**

- Annual screening for albuminuria using albumin-to-creatinine ratio once the child has had diabetes for 5 years.
- Estimate glomerular filtration rate at initial evaluation and then based on age, diabetes duration & treatment.

# Type 1 Diabetes: other considerations



- **Retinopathy :**

- At age  $\geq 10$  years or after puberty has started, whichever is earlier, once the child has had diabetes for 3–5 years.
- After the initial exam, annual follow-up is recommended.
- Less frequent exams, every 2 years, may be acceptable on the advice of an eye care professional.

# Type 1 Diabetes: other considerations



- **Neuropathy :**

→ Neuropathy rarely occurs in prepubertal children or after only 1–2 years of diabetes

→ **Annual** foot exam at the start of puberty or at age  $\geq 10$  years, whichever is earlier, once the child has had DM I for 5 years.

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# DM I - Self-management



- The management of T1 diabetes is ‘painful, difficult and time-consuming’ invading every aspect of child/ adolescent life and involves:

- 1) Multiple injections of insulin or use of insulin pump.
- 2) Careful counting of carbohydrate (CHO) content of meals and snacks and matching insulin to this.
- 3) Regular monitoring of blood glucose levels.
- 4) Lifestyle considerations, e.g. stress, exercise, and timing of meals.

# Challenges in treating children with DM I



DIABETES

10.2

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# Challenges in treating toddlers

- Missed diagnosis because of rarity
- Non specific symptoms
- Rapid metabolic decompensation
- Total dependence on the adults around them
- Psychological effects on the parents
- How to give injections & Lipohypertrophy
- Extended family carers
- Nursery & preschool.
- Irregular food patterns



# Challenges in teaching school aged children



- Large variation in development, and ability
- Awareness of being different from their peers
- Variable learning styles – visual, rote, auditory.
- Level of priority
- School involvement



# What about adolescents?



Adolescence is often a time that is associated with a period of **poor metabolic control**- therefore it is a significant time for the development of **diabetes-related complications**.

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# Why is adolescence so problematic?



- Hormonal influences cause blood glucose levels and subsequently insulin requirements to increase.
- However, these difficulties cannot be explained on a purely physiological level.

**\*\*\*We NEED to consider Psychological impact of Diabetes.**

# (Some) psychosocial factors during adolescence



- ✓ Becoming part of a peer group-accepted rules and norms-  
important aspect of adolescent life.
- ✓ Peer-pressure report more peer-support for certain  
diabetes-related behaviours than younger children-change.
- ✓ Move from parental control towards independence is vitally  
important for self-esteem.
- ✓ Intra-familial conflict-parental involvement ↓ and may lead  
to a decrease in metabolic control. Can lead to conflicting  
opinions!

# (Some) psychosocial factors during adolescence



- ✓ Adolescents often feel that they are being judged by everyone, in particular their friends. **Highlights the importance of the patient-provider relationship and the dynamics of that relationship.**
- ✓ They can experience poor self-esteem and self-efficacy!

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# Biopsychosocial Model



- Consideration of biological, psychological and social factors that underpin health-related behaviours.
- Explicit appreciation of mind-body-behaviour link.
- Balance of power-knowledge and expertise.
- Decision-making-treatment plans and implementation.

**Central importance is patient relationship with health care professional.**

# Relationship with Health Care Provider (HCP)



- A good relationship can facilitate good self-management.
- Important in two ways:
  - Honest exchange of info from parents/adolescent to clinicians regarding level of management.
  - Reliance on HCP's to share expertise and encourage good self-management.
- A higher degree of conflict in the relationship was reported in those adolescents whose diabetes was poorly controlled than if it was moderately or well controlled .
- **Generally these arguments centred around lying, a common coping mechanism used in order to avoid negative responses from health care providers.**

# Relationship with Health Care Provider (HCP)



## Study:

Freeman and Loewe (2000) Barriers to communication -differing patient-provider perspectives.

- Highlighted the importance of qualitative outcome measures-  
→ HCP often ignore psychological factors, e.g. quality of life, that are often more important to the patient.

One HCP said: “I think most of them have 10 or 15 concerns that are ahead of DM , so we’re having to get through all those things before we hit the behaviour change in dealing with diabetes. You know, child-care issues, transportation issues, violence. Everything. You’ve got to find out those things that are ahead of the diabetes”

# Anxiety within diabetes



- Diabetes doesn't occur in isolation-families and relationships.
- **Significant anxiety about hypoglycaemia and future complications.**
- This may be the source of conflict and may increase relationship stress.

(Trief, Sandberg, Dimmock, Forken and Weinstock, 2013).

# Anxiety within diabetes



- Study (1) : Elevated anxiety symptoms were found in 40% of participants, with no reported difference between diabetes type (Grigsby, Anderson, Freedland, Clouse and Lustman (2002)
- It may compromise metabolic control at a behavioural level by interfering with self-management behaviours.
- BUT** stress itself can elicit a **hormonal response that is counter-regulatory and energy mobilising.**
- This can lead to an increase in blood glucose levels.

(Hermanns, Kulzer, Krichbaum, Kubiak & Haak, 2005).

# Anxiety within diabetes

- **Study (2)** : 276 adolescents with DM I and their caregivers completed measures of anxiety symptoms.
- Trait anxiety symptoms that suggest further clinical assessment is needed were present in 17% of adolescents.
- Higher levels of state anxiety symptoms were associated with **less frequent BGM ( $p < .0001$ ) and suboptimal glycemic control ( $p < .0001$ ).**

(Herzer & Hood, 2010).





# Anxiety within diabetes



## Multiple levels of anxiety:

- ✓ Hypo-based anxiety and personal safety at work.
- ✓ Peer-related anxiety.
- ✓ Capability being questioned.
- ✓ Social acceptance.



# Anxiety within diabetes- How to manage it ?



Thinking points:

- ✓ Maturity of the patient.
- ✓ **Fear** of hypoglycaemia or related comorbidities.
- ✓ Relationship with the healthcare provider.
- ✓ Relationship with family & friends.
- ✓ Feeling of embarrassment.

# Anxiety within diabetes- Management ?

- ✓ **Consider screening for anxiety in people exhibiting anxiety or worries regarding DM complications, insulin injections, taking medications, and/or hypoglycemia that interfere with self-management behaviors.**
- ✓ **Refer for treatment if anxiety is present.**
- ✓ **Persons with hypoglycemic unawareness, which can co-occur with fear of hypoglycemia, should be get intensive training to help re-establish awareness of hypoglycemia and reduce associated fear.**

# DM I- Depression



- 8-27% incidence
- **Depression is associated with:**
  - ✓ Poor glycemic control
  - ✓ Impact on concordance (harmony or conformity)
  - ✓ Impact on self care
  - ✓ Impact on health related behaviors.
  - ✓ Comorbidity
  - ✓ Impact on quality of life

# DM I- Depression



## Diabetes Worsens Depression:

- ✓ Poor glycemic control worsens mood
- ✓ Psychological impact
- ✓ Social impact
- ✓ Comorbidity – renal, cardiac, retinopathy
- ✓ Sexual dysfunction
- ✓ Access to means of suicide

# DM I- Depression



## Diabetes-Depression

- Increased risk of depression particularly IDDM
- Depression increases risk of type II DM

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# Diabetes

abnormal levels of  
norepinephrine and serotonin

high levels of cortisol  
(impairs insulin sensitivity)

loss of energy

nervousness/anxiety

suicidal thoughts

change in appetite

stress of daily diabetes  
management (primarily,  
daily difficulty of keeping  
blood sugar levels under control)

occasional tension between  
patient and doctor

fatigue/exhaustion exercising

difficulty making  
dietary changes

# Depression

# DM I- Depression/ Management



- ✓ **Screening/Assessment**
- ✓ **Psychoeducation**
- ✓ **Self management**
- ✓ **Motivational interviewing**
- ✓ **Psychological treatment – CBT**
- ✓ **Pharmacological approaches**
- ✓ **Risk management**

# DM I- Depression/ Management



- Consider annual screening with age-appropriate depression screening measures.
- Beginning at dx of complications or when there are significant changes in medical status.
- Referrals for treatment of depression should be made to mental health providers **with experience using evidence-based treatment approaches.**

**In conclusion ...**



**It is important to consider psychological and social factors that often impact detrimentally on metabolic control and what could be done to combat the effects of these.**

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