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

- ¾ 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.

American Diabetes Association Standards of Medical Care in Diabetes. Children and adolescents. *Diabetes Care* 2017; 40 (Suppl. 1): S105-S113

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.**

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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

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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.

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.**

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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

Type 1 Diabetes: other considerations

- **Dyslipidemia** → Obtain a fasting lipid profile in children ≥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 ≥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 ≥10 years, whichever is earlier, once the child has had DM I for 5 years.

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

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.

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!**

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.**

American Diabetes Association Standards of Medical Care in Diabetes. Comprehensive Medical Evaluation and Assessment of Comorbidities. Diabetes Care 2017; 40 (Suppl. 1): S25-S32

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

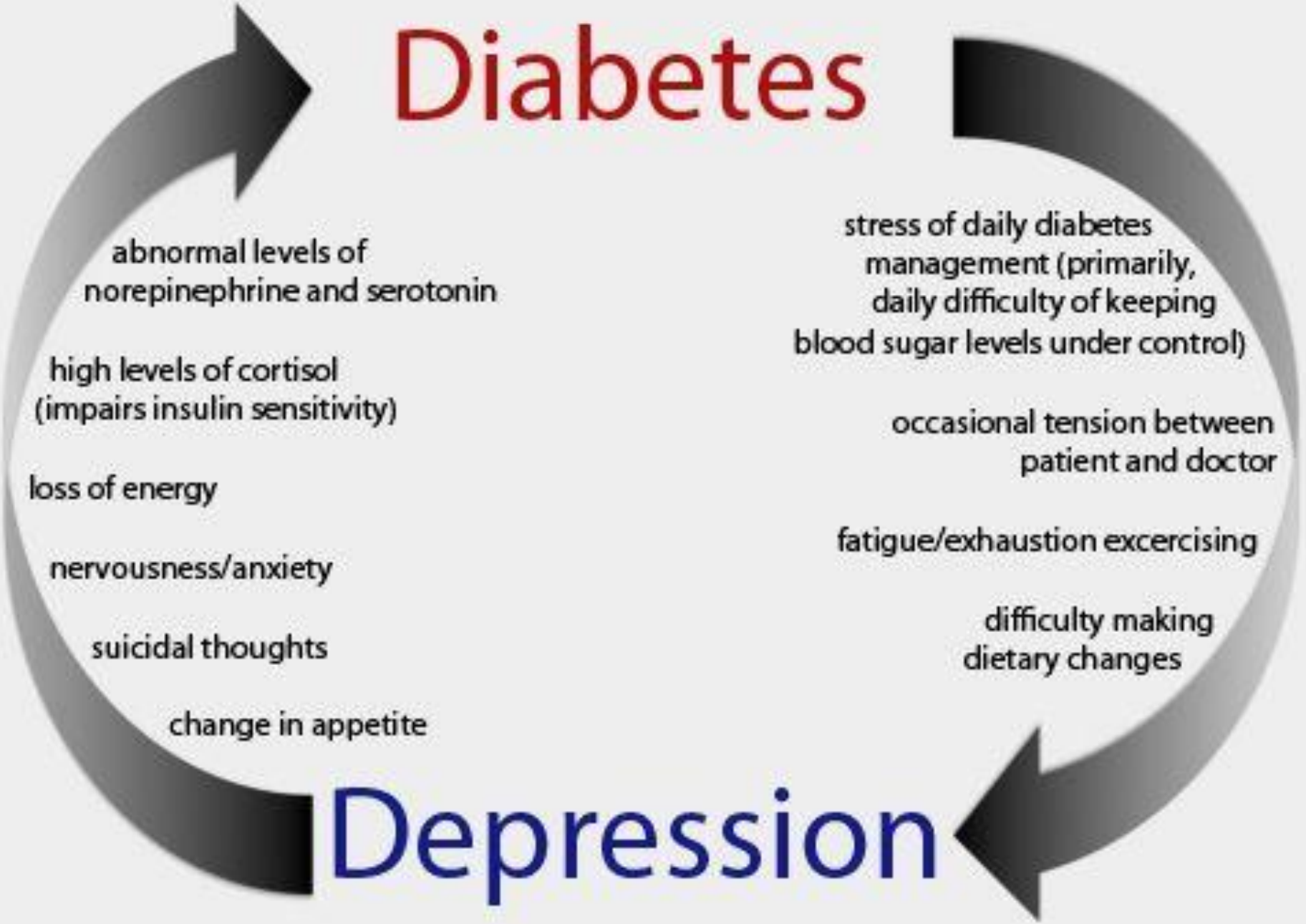
Diabetes Worsens Depression:

- ✓ 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



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.**

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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.