National Children & Young People's Diabetes Network

Diagnosis and Initial Management of Type 2 diabetes in CYP

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Presentation

1. Asymptomatic but high BMI (>85th centile) and 1 or more of the following referred by GP or another Specialist after screening tests.

- 1st or 2nd degree FHx of type 2 diabetes
- High risk race/ethnicity
- Signs or symptoms of Insulin resistance (Acanthosis Nigricans)
- Other metabolic conditions like high BP or cholesterol
- Gestational diabetes

Presentation

2. Symptomatic, typical symptoms of polydipsia and polyuria with longer duration with 1 or 2 risk factors ; otherwise well

Same day testing /Screening tests after discussing with the local Diabetes team

- Random glucose
- HbA1c
- Fasting glucose (increased sensitivity)
- OGTT-gold standard

Presentation

3. Symptomatic, unwell with tiredness, some weight loss and polydipsia and polyuria

- Via ED
- Can be dehydrated +/- very high blood sugars
- Metabolic acidosis, ketosis - Remember risk for DKA
- Rarely altered consciousness, with high BG over 30mmols, lesser degree of ketosis with dehydration - think of HHS (hyperglycemic, hyperosmolar state)

Diagnosis/Investigations

Current National Guidance:

1. Fasting plasma glucose (FPG) ≥ 7.0 mmoL/L (126 mg/dL)
2. Post OGTT 2-hour plasma glucose ≥11.1 mmoL/L (200 mg/dL)
3. Symptoms of diabetes and a random plasma glucose >11.1 mmol/L (200mg/dl)
4. HbA1c ≥ 48 mmol/mol (6.5%) - DCCT aligned, not POC

- OGTT - ?gold standard but cost/staffing/arranging are barriers
- Repeat test on different day if asymptomatic

If HbA1c 42 – 47: has prediabetes so repeat HbA1c in 3-6 months or OGTT

Some variation with recent NICE guidance

Differential Diagnosis

Type 1 or Type 2 diabetes?

- Clinical history
- Family history – first degree relatives Hx is crucial
- Ethnicity – obesity not always assoc with high risk groups
- Consider testing for autoantibodies (ISPAD as well) – Zn Transporter, IA-2, GAD

- Blood tests – C peptide levels (controversial: only helpful if very high as significant overlap in first year between type 1 and type 2 diabetes)

- Consider monogenic diabetes

– mild disease, present in 3 generations, consider genetic testing

- Consider stress induced

– asymptomatic, intercurrent illness

Initial management

- MDT: Psychologist/dietitian/Medical/ PDSN

- Education
- Lifestyle
- Set goals
- Medication
- Glucose monitoring

Assess for co morbidities

- Blood pressure/dyslipidaemia/liver enzymes/Albumin Creatinine Ratio/Obstructive Sleep Apnoea

Don’t forget……

- smoking/alcohol/drugs
- driving
- Anxiety/behavioural assessment
- contraception

Initial management-Asymptomatic

- The aim of treatment is to reduce HbA1c to < 48mmol/mol and treat/prevent associated co-morbidities
- Start on Metformin after discussion with the young person and their family(given the patient has normal kidney function)
- 500mg daily and titrate up weekly(BD) to 2g as tolerated. Consider SR preparations
- Encourage to have with meals and explain side effects.
- Patients should be trained to do SMBG and encourage to test several times/week- mix of fasting/pre-prandial and post-prandial
- Explore and offer community support, including school

Initial management - symptomatic, well

- If stable and HbA1c below 70mmol/mol(8.5%),start on metformin and life style support+ ongoing MDT support
- Rest of the management as before.
- If stable and HbA1c is above 70mmmol/mol, start on long acting basal insulin(Levemir/Lantus) 0.25-1.5units/kg/day along with metformin
- Basal insulin can be tapered and stopped over 2-6 weeks, with metformin being titrated up

Initial Management – symptomatic, unwell

- If unwell with high sugars and ketosis, have polydipsia polyuria and weight loss or HbA1c over 70 -start on DKA pathway similar to T1DM with IV insulin

- Change on to s/c basal insulin when stable and move to metformin after the Diabetes related antibodies are back

- Insulin should be stopped, once reached the optimum dose of metformin

Clinical case 1

Presented on a summer BH in 2022 via ED

15 year old with H/o polydipsia, polyuria and some weight loss >1month

Referred by GP as ? new diagnosis of diabetes-not sure about the type

GP bloods, Lab BG-12.2

Family History

Refugee family from Syria-Kurdish speaking

Mum has diabetes-on insulin at 30+ years, maternal uncle has T2DM

Grand mother has T1DM, Ethnicity- Afro-Caribbean

Height- 1.72 cm Weight- 103..8 kg BMI-

Examination –BP 140/92, no acanthosis

HbA1c-86mmol/mol

LFT-abnormal with raised ALT and AST>100

Question 1:
As part of the initial management, will you start on insulin?

1. YES
2. NO

Clinical case 1

- Admitted and started BD Levemir and metformin with
- Seen in clinic next day with an interpreter

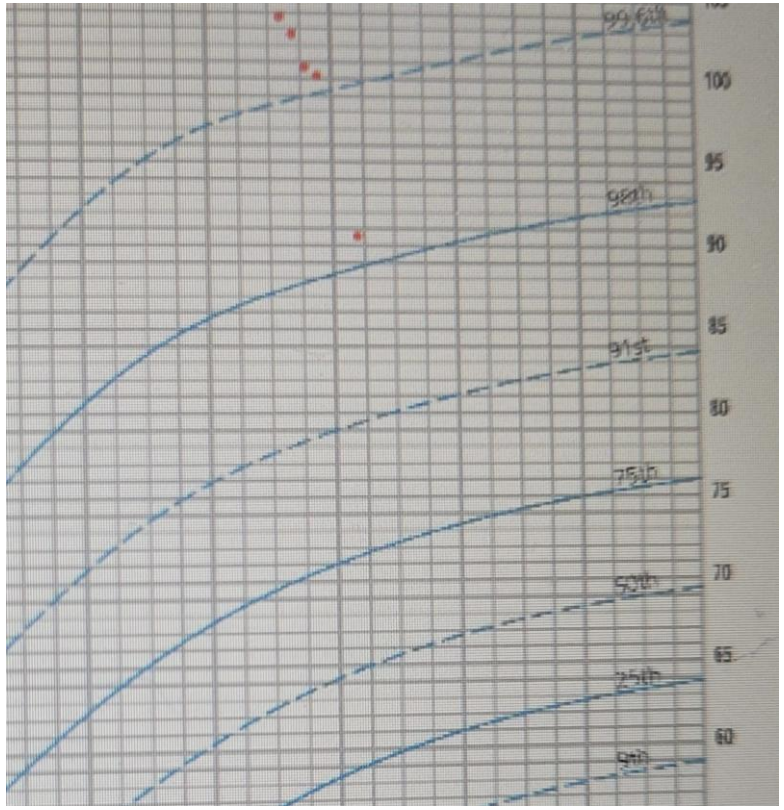
-USS abdomen-confirms fatty infiltration NASH, plans to taper off insulin and BP monitoring

MDT education with Dietician and Nurse, with session 1 and 2 on the same day

- Clinic in 4 weeks-C-Peptide very high, Diabetes related antibodies negative results and off insulin. Weight dropped by 4kg!
- Last clinic in March- weight 90.65kg(lost 12.4kg),BP-normal

Walks 1hour daily with a morning run of 20-30minutes,3 meals and 1 snack, less carbs(?around 100g/day) and more protein

HBA1c-42mmol/mol



Clinical case 2

Outreach Paediatric Urology Clinic, DGH in 2021

10yr old male, longstanding complex urological condition, multiple surgeries, DNA'd a few urology appointments

Episodic dysuria for years

Recent polyuria and polydipsia, mostly drinking water in the day

Grandmother had T2DM

Height: 150.9cm

Weight: 83.6kg

BMI: 36.7kg/m2 (SDS: +3.6)

O/E: acanthosis nigricans

Question 2:
What are your next steps in this outpatient clinic??

Options:
1.Urine dipstick and culture as UTI most likely
2. Random glucose, urine dip, HbA1c
3. Come back for fasting bloods – glucose, lipids, liver function tests
4. OGTT

Clinical Case 2

Random Glucose: 7.0

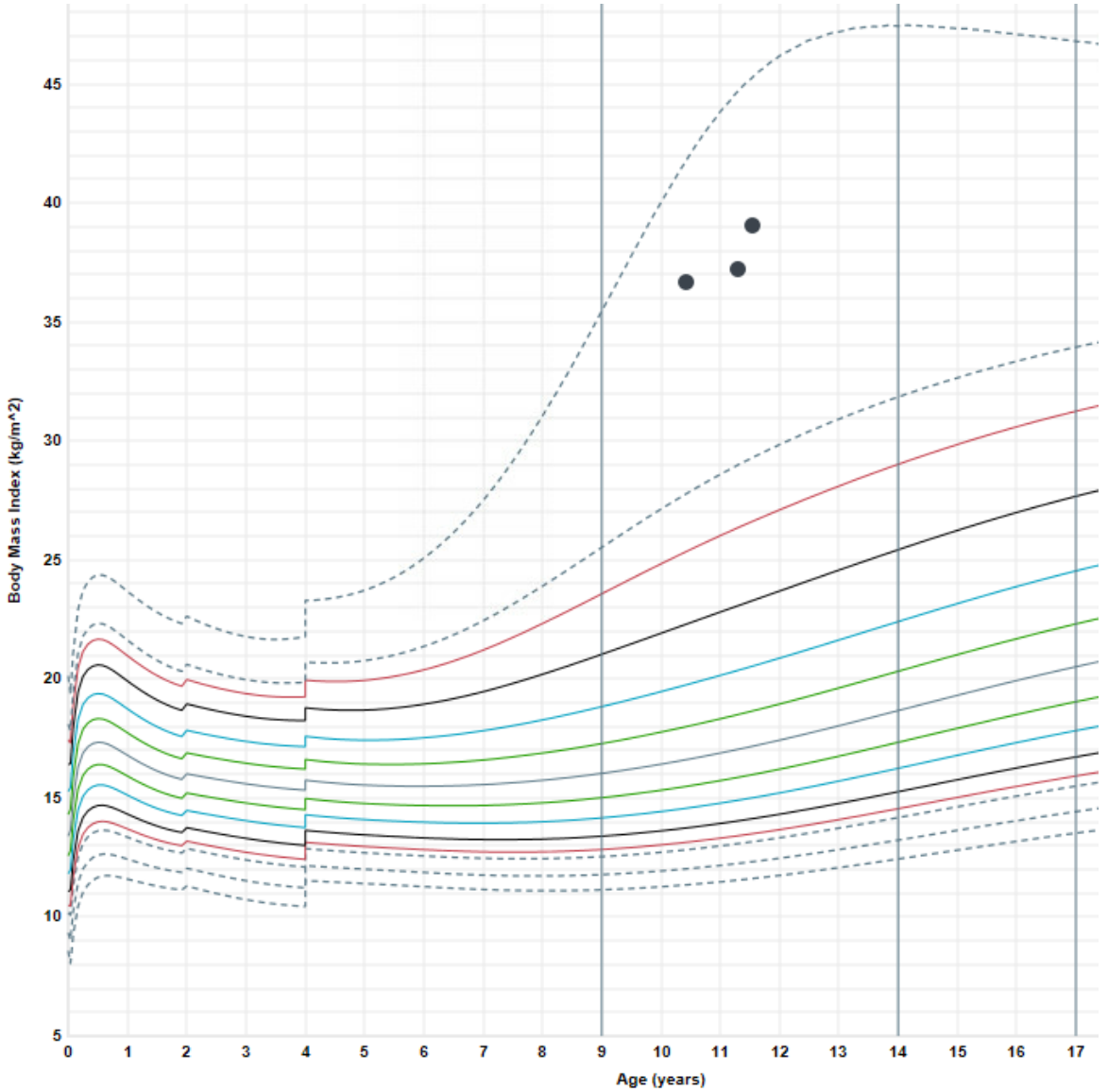
Urine dip: nitrites positive, neg to glucose and ketones

Result on Friday evening:
HbA1c: 72mmol/mol

Question 3:

What are your next steps on Friday at 6pm?

1. Admit to the ward, start Insulin and Metformin
2. Explain diagnosis, bring back following week but come in tonight for glucose monitor and Metformin prescription
3. Arrange review in diabetes clinic in next 2 weeks



Key Messages

- Highest risk of T2DM in CYP with high BMI and at least 1 first degree relative with confirmed T2DM
- In ethnic minorities however, obesity is not essential for a diagnosis of T2DM
- Consider differential diagnoses
- Initial management needs focus on MDT approach and consistent messaging