**Type 2 Diabetes in children**

**Pathophysiology Who to test for type 2 diabetes in children**

Increase Adiposity

Ethnicity

 Insulin Resistance

Insulin Deficiency

Type 2 Diabetes Mellitus

The American Diabetes Association recommends testing asymptomatic overweight and obese children and adolescents for T2DM after the onset of puberty or ≥10 years, whichever occurs earlier, if they meet the following screening criteria:

●T2DM mellitus in a first- or second-degree relative.

●High-risk racial/ethnic group: Native American, African American, Latino, Asian American, or Pacific Islander.

●Signs and conditions associated with insulin resistance or small for gestational age for birth weight.

●Maternal history of diabetes or gestational diabetes during the child's gestation.

**Definition of Type 2DM**

●Fasting plasma glucose ≥126 mg/dL.

●Random venous plasma glucose ≥200 mg/dL in a patient with classic symptoms of hyperglycemia.

●Plasma glucose ≥200 mg/dL measured two hours after a glucose load of 1.75 g/kg (max-75 g) in an oral glucose tolerance test.

●Hemoglobin A1c>6.5% on two separate occasions.

Symptoms-asymptomatic, polyuria, nocturia, enuresis, increased thirst, fatigue, increased appetite, longstanding weight gain but possible recent weight loss and menstrual irregularity in females

**Difference between type 1 diabetes and type 2 diabetes**

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| --- | --- | --- |
| **Features** | **Type 1 DM** | **Type 2 DM** |
| Age predisposition | Throughout childhood | Puberty |
| Ethnicity at risk | Non-Hispanic white | Latino, Afro-American, natives |
| Body Habitus | Thin, normal or obese | obese |
| Family History | 5-10% | 75-90% |
| Insulin resistance | Not present | Present |
| Ketosis at presentation | Common | 5-10% of cases |
| Pancreatic antibodies | Present | Not present |
| C-peptide levels | low | high |

**Other type of Diabetes which presents as type 2 diabetes**

●Maturity onset diabetes of the young(MODY) – clinically heterogeneous disorder characterized by non-insulin dependent diabetes diagnosed at a young age with autosomal dominant transmission and lack of pancreatic autoantibodies.

●Diseases of the exocrine system such as Cystic fibrosis, endocrine abnormalities in glucose regulation such as Cushing syndrome and drug-induced diabetes – glucocorticoids, HIV protease inhibitors, cyclosporine, l-asparaginase, tacrolimus and second generation antipsychotics.

**Management of type 2 diabetes**

Healthy life styles is the corner stone of the management. Metformin is the only oral drug approved for children >10 year. Insulin can be started when diabetes is uncontrolled after lifestyle changes, metformin and or Hemoglobin A1c>8%.

**Complications of type 2 Diabetes**

●Acute

 1-Non ketotic hyperosmolar state-characterized by glucose >600 mg/dL, serum osmolality >330 mOsm/kg and severe dehydration, with little or no ketonuria. Electrolyte abnormalities: pseudo-hyponatremia (secondary to blood glucose elevation), metabolic acidosis, elevated blood urea nitrogen and creatinine (secondary to dehydration).

2- Diabetic ketoacidosis

**●Chronic complications can be divided into microvascular and macrovascular**

Microvascular complications

-Nephropathy-start checking urine for microalbumin at the time of diagnosis and then yearly.

-Retinopathy-dilated eye exam at the time of diagnosis and then yearly.

-Neuropathy-less common in comparison of nephropathy and retinopathy. Start screening at puberty with monofilament.

Macrovascular complications-Hypertension and dyslipidemia starting in teenage years can contribute to the increased risk of heart disease and peripheral vascular disease in adults.

**Comorbidities -**1-Hypertension 2-High lipid levels 3-Nonalcoholic fatty liver disease