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# Diabetes mellitus type 2 in paediatrics. The importance of screening and early treatment

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Diabetes mellitus type 2 (T2D), formerly known as noninsulin-dependent diabetes, is a disorder arising from insulin resistance and relative (rather than absolute) insulin deficiency in the absence of autoimmune β-cell destruction. It is a polygenic disorder involving interactions between genetic and environmental risk factors that result in pancreatic β-cell failure.[1]

The true incidence and prevalence of T2D in children and adolescents remains unknown due to the lack of systematic screening, although numerous data corroborate an alarming increase in the past decade parallel to the increase in obesity. The latter constitutes the most frequent cause of insulin resistance in childhood and adolescence and is also associated with prediabetic metabolic states, such as impaired fasting glucose or impaired glucose tolerance.[2]

The onset of T2D occurs most frequently in adolescence, when insulin levels peak and insulin sensitivity decreases by around 30%.[1]

Type 2 diabetes is often asymptomatic. Patients may also present with classic symptoms of diabetes, such as polyuria, polydipsia, blurry vision and weight loss in association with glycosuria or even ketonuria. Patients may occasionally have onset with diabetic ketoacidosis or hyperglycaemic hyperosmolar nonketotic state, which may be fatal.

The diagnostic criteria for diabetes (American Diabetes Association, 2015) are the following:

- Fasting plasma glucose > 126 mg/dL or random plasma glucose > 200 mg/dL, measured on several occasions if without symptoms (polyuria, polydipsia and weight loss).
- Plasma glucose > 200 mg/dL 2 hours after glucose challenge (performed with doses of 1.75 g glucose/kg to a maximum of 75 g dissolved in water).
- Glycated haemoglobin (HbA1c) ≥ 6.5%.

In 2015, the American Diabetes Association recommended screening for T2DM in children with overweight (body mass index [BMI] > 85th percentile for age and sex, weight for height > 85th percentile, or weight > 120% of ideal for height) with 2 additional risk factors: 1) family history of T2D in first- or second-degree relative; 2) race/ ethnicity (Native American, African American, Latino, Asian American, Pacific Islander); 3) signs of insulin resistance or conditions associated with insulin resistance: acanthosis nigricans, hypertension, dyslipidaemia, polycystic ovary syndrome, or small for-gestational-age birth weight; and 4) maternal history of diabetes or gestational diabetes.[3]

The use of HbA1c, as the sole marker for the diagnosis of DM remains controversial at present.[3]

Youths with T2D have a high prevalence of complications related to diabetes and obesity, leading to a reduction of 15 years in life expectancy. Various studies have indicated that at the time of diagnosis, hypertension is found in 10% to 32% of patients, microalbuminuria in 14% to 22%, retinopathy in 9.3%, dyslipidaemia in up to 85%, and non-alcoholic fatty liver disease in 22% in the population aged less than 30 years.[1]

A long-term study conducted in Japan over a period of 20 years found that 24% of the 1063 participants became blind at a mean age of 32 years.[1]

Another study that followed 426 participants with early-onset T2DM over a mean period of 6.8 years found that 3% required renal dialysis by 35 years of age.[1]

In the current issue, *Evidencias en Pediatría*[4] presents a critical review of an article that assessed the feasibility and effectiveness of a computerised system (CHICA T2D) to identify children aged 10 or more years and adolescents at risk for T2D and to coordinate screening for and diagnosis of T2D. It concluded that the computerised support system was useful, as it was associated with an increase in testing of at-risk patients and improved followup, although its impact on health outcomes is unknown.

As regards treatment, patients with T2D and their families must receive adequate education on diabetes, emphasising the need for frequent capillary blood glucose monitoring.

Management must include nonpharmacological measures (changes in lifestyle, dietary interventions and increased physical activity) as well as pharmacotherapy (insulin and

metformin, the only agents approved in Europe and the United States).

Thus, primary prevention of T2D must aim at halting the obesity pandemic and emphasise screening and early diagnosis of this disease, given the high prevalence of its associated complications.[3]

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