

Childhood Obesity: Today's and Tomorrow's Health Challenge

Indian Pediatrics is publishing three interesting papers about different aspects of childhood obesity in this issue(1-3). In their paper entitled "Body fat distribution in childhood obesity: Association with metabolic risk factors", Semiz, *et al.*(1) report their findings about the associations of subcutaneous and intraabdominal (preperitoneal and visceral) fat, estimated by ultrasonography, with cardiometabolic risk factors. Given that contrary to adults, abdominal subcutaneous fat thickness has been positively correlated with insulin and insulin resistance, it is suggested that there is a synergistic effect of subcutaneous fat on the development of hyperinsulinemia in childhood. Therefore, the role of subcutaneous fat in childhood obesity is likely to be different than in adult obesity.

Interest in childhood precursors to chronic diseases is increasing because it is well documented that both behavioral and biological risk factors of such diseases persist from childhood into adulthood, and that several risk factors including overweight, dyslipidemia and high blood pressure are tracking from childhood to adult life, and are linked to adult diseases. Population-based studies concerning the correlation of anthropometric indices and the risk factors of chronic diseases in children and adolescents, although limited, have documented that in children, as in adults, abdominal or upper body fat carries an increased risk for metabolic complications such as dyslipidemia, insulin resistance and high fasting glucose, as well as for high blood pressure(4).

Underlying genetic tendency or adverse events in early life may contribute to adverse body fat-patterning and its related complications in non European populations(5). For clinical practice and epidemiological studies, child over-weight and obesity is usually assessed by indicators based on weight and height measurements, such as body mass index (BMI); however, this index cannot distinguish

fat from muscle mass, nor can it represent the fat distribution. Abdominal or central obesity, a state of excessive accumulation of visceral fat (body adipose tissue located within the abdominal cavity around the visceral organs), has emerged as an important predictor for cardiometabolic complications and adverse health effects(6). In addition, higher levels of waist circumference, and not BMI, are found to be associated with markers of inflammation and oxidative stress in healthy youths(7). The findings of Semiz, *et al.*(1) showing that the increase in total body fat leads to fat deposition in both subcutaneous and visceral areas, and that abdominal subcutaneous fat thickness might be a better predictor of the risk for hyperinsulinemia in childhood obesity highlight the importance of conducting additional studies about fat patterning in children of different ethnicities. Studying the early relationships of fat deposition with insulin resistance, markers of inflammation and atherosclerosis would help to better understand the pathogenesis.

Two other papers in this issue provide alarming data about the considerably high prevalence of childhood overweight and obesity among Indian children and adolescents. Of special concern in the context of one of these studies is the high prevalence of overweight in young children of preschool age. A paradox of childhood underweight/overweight and a rapid increase in childhood obesity and metabolic syndrome exist among children and adolescents living in many developing countries(8). The rapid progress of urbanization and demographic trends is associated with a cluster of unhealthy Western lifestyles. Sedentary activities and consumption of calorie-dense foods of low nutritional value might be the most important etiological factors responsible for very high rate of childhood overweight in developing nations. Until now, most national public health programs and policies, as well as national-level research on children of low and middle-income countries, have focused on undernutrition and its effects on the survival and mortality of mothers and children. Health professionals and policy-makers should focus on primordial/primary prevention of

childhood obesity, in low- and middle-income countries, which are facing an epidemic of chronic non-communicable diseases in the near future.

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Pitfalls in Investigating for Diabetes Insipidus

Many pediatricians will remember a clinical case or scenario that highlights the potential pitfalls when investigating patients with suspected diabetes insipidus(1). Water deprivation tests, like tests of anterior pituitary function, can be misleading with false positives and false negatives. For example, patients who fail deprivation tests by developing a plasma osmolality greater than 300 mOsm/kg, may ultimately be found to have primary polydipsia. Conversely, patients who 'pass' a deprivation test one week can fail the test in the next week. In the case of patients with primary polydipsia, the raised plasma osmolality may reflect an impaired urinary concentrating ability in a child with polydipsia. The

fact that a child can 'fail' a test shortly after being found to have apparently normal posterior pituitary function may reflect a varying capacity of a diseased hypothalamo-pituitary axis to produce appropriate amounts of vasopressin.

Factors such as the pattern of fluid intake, baseline biochemistry, the response to desmopressin and a period of observation in hospital may all prove to be extremely useful parameters when assessing a child with polydipsia. Hence, there is much more to the assessment of these children than deprivation testing alone. In our center, we have 'hijacked' the language of our local genetics team and talk about some children 'growing' into a diagnosis. This makes the point that one test does not necessarily provide an answer and information may need to be gathered over a period of time before a diagnosis is reached.