

Revisiting Childhood Obesity



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It is no surprise that childhood obesity has garnered much attention from the media and medical communities alike, and rightly so. In 2005, the Canadian Community Health Survey found that one in four Canadian children were obese or overweight, a three-fold increase since the late 1970s.¹ These children often have multiple risk factors for later disease at the time of their initial presentation. In a longitudinal study by Morrison, *et al.*, teens with multiple cardiovascular risk factors had a 14-fold increased risk of cardiovascular event (MI, CABG, angioplasty or stroke) after 25 years of follow-up.²

What is the cause of this surge in overweight youth?

Although the physiological basis for weight gain has been studied extensively and we now have much insight into the biology of obesity, weight gain results simply from an imbalance of energy intake and expenditure. Identifying the origins of this imbalance is key, and to do so we must go beyond the individual patient and identify the broader causes of the epidemic. Individual patients are susceptible to the influences of their schools, homes, communities, and national and international factors (*e.g.*,

school activity, health policy, globalization of markets).

In addition, we have begun to understand that there are critical times during development when children are more susceptible to, or are at increased risk of, weight gain due to a number of factors.

Fetal life

Maternal gestational diabetes, maternal obesity, smoking during pregnancy, and pre-eclampsia can be indicators of increased risk.

Infant life

Breastfeeding may have a protective effect against childhood obesity, possibly due to early development of appetite control and satiety in breastfed children, compared to those who are bottle-fed.

Child life and adolescence

Soft drink consumption, increased portion size, and decreased fruit and vegetable consumption are common correlates of energy imbalance in children and adolescents. Some of these trends may relate to societal influences and cultural habits, such as eating out, and a decreased emphasis on home economics and cooking

classes. Increased screentime (beyond two hours per day), and reduced physical activity are also significant contributors to weight gain. Less than 20% of Canadian children meet the national exercise requirement, of 60 minutes, six times a week!³

How do we approach this situation in a clinical setting?

Step 1: Identify families that would benefit from anticipatory guidance

In families with a history of obesity, or where the mother had gestational diabetes, the child may have a predisposition to obesity and may benefit from anticipatory guidance. Knowledge of individual patient circumstances and family dynamics can also help to identify these patients. Anticipatory guidance focuses on healthy lifestyle behaviours.

Step 2: Investigate other possible causes for the child's obesity

It is important not to overlook other potential causes for the child's weight gain. Serial BMIs help to identify children who are gaining weight quickly.

In children with reduced growth velocity, it is important to look for other etiologies, such as genetic abnormalities or endocrinological problems. To identify the former, look for dysmorphic features on physical exam and relevant information on history. To identify the latter, a clinical exam and biochemical testing can be helpful. TSH and free T4 tests can be ordered to rule out hypothyroidism, and a 24-hour urine cortisol test screens for Cushing's. In cases of suspected growth hormone deficiency, a pediatric endocrinology consult is recommended for stimulation testing.

Remember that children who are overweight due to energy imbalance tend to be tall for their genetic potential.

Step 3: Assess readiness for change

In the absence of a growth abnormality, or any other identifiable cause for obesity, assess behavioural and lifestyle factors contributing to the child's weight gain. Assess the patient and family's readiness to change (motivation, barriers to change, and opportunities for change).

What are the principles of on-going management in the pediatric population?⁴

Medical management and routine screening

As is the case with adult obesity, childhood obesity often carries significant co-morbidities. As a general guideline, serial blood pressure measurements can be used to monitor hypertension, fasting lipid profiles after ten-years-of-age can be used to screen for dyslipidemia, and liver transaminases can be used to investigate non-alcoholic fatty liver disease. Fasting glucose after ten-years-of-age is useful as a marker for Type 2 diabetes, but may not predict pre-diabetes in children.

Other conditions to be monitored by history and physical examination are GERD, gallstones, obstructive sleep apnea (OSA), polycystic ovarian syndrome (PCOS), and musculoskeletal consequences (*e.g.*, spondylolisthesis, slipped capital femoral epiphysis [SCFE], tibia vara, axial arthritis). Mental health disorders, including depression, binge-eating disorders, and low self-esteem, may co-exist with childhood obesity.

Family-based behavioural therapy

Emphasis is placed on appropriate nutrition and physical activity. This involves the collaboration of a multidisciplinary team, with the family at the centre, actively facilitating change. Goal setting and motivational interviewing are key. To engage the child and parents as participants in the family's long-term plan, discuss actual goals and plans for actions that will lead to change. Involving the parents empowers them as integral catalysts in the process of change. Such behavioural lifestyle interventions have been proven effective at lowering weight, although sustainability of change can be very difficult.


Pharmacotherapy

Orlistat inhibits fat absorption, and if fat intake is not reduced, may potentially cause significant diarrhea.⁵

Surgical

Gastric bypass or banding are possible surgical treatments.

Conclusion

Although pharmacotherapy and surgical options are available, their overall effectiveness has not been fully elucidated. What we do know, is that lifestyle intervention has been proven effective in lowering weight. 

References

1. Canadian Community Health Survey. Statistics Canada. 2005.
2. Morrison JA, Friedman LA, Gray-McGuire C. Metabolic Syndrome in Childhood Predicts Adult Cardiovascular Disease 25 Years Later: The Princeton Lipid Research Clinics Follow-up Study. *Pediatrics* 2007;120(2):340-5.
3. Janssen I, Katzmarzyk PT, Boyce WF, et al. Comparison of Overweight and Obesity Prevalence in School-aged Youth from 34 Countries and their Relationships with Physical Activity and Dietary Patterns. *Obesity Reviews* 2005;6(2):123-32.
4. Lau DCW, Douketis JD, Morrison KM, et al. 2006 Canadian Clinical Practice Guidelines on the Management and Prevention of Obesity in Adults and Children (Summary). *CMAJ* 2007;176(8):S1-S13.
5. Chanoine JP, Hampl S, Jensen C, et al. Effect of Orlistat on Weight and Body Composition in Obese Adolescents: A Randomized Controlled Trial. *JAMA* 2005;293(23):2873-83.

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