

Childhood obesity – rising trends worldwide

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Introduction

During the past two decades, the prevalence of obesity in children has risen greatly worldwide. Obesity in children causes a wide range of serious complications and increases the risk of premature illness and death in later life.¹ Excess body weight is now the most common childhood disorder in Europe. It affects around one child in six, but in some parts it affects one child in three.

Well-documented major increases in adult obesity levels are now mirrored in rapidly rising levels among children. Overweight children are more likely to become overweight adults, with a greater risk of cardiovascular disease, diabetes and other disorders.²

Definition of obesity

Body mass index (BMI) is the ratio of weight (kg) in kilograms to the square of height in metres (m²).³

- At risk of overweight: BMI for age 85th percentile to <95th percentile.
- Overweight: BMI for age >95th percentile.³
- Overweight or obese: BMI between 85th and 95th percentile for age and sex.⁴
- Underweight: BMI for age <5th percentile.

Epidemiology

The definition of overweight and obesity differ between epidemiological studies. The prevalence of childhood obesity is estimated to be 25-30%. The prevalence of obesity has increased by 54% in children aged 6-11 years and by 39% in adolescents aged 12-17 years. The prevalence of severe obesity jumped 98% and 64% within these groups, respectively. Hispanic, Native American and black patients tend to be more affected than other populations. The prevalence of obesity has increased 2.3 to 3.3-fold over 25 years in the US, 20-fold over 10 years in England and 3.9-fold over 18 years in Egypt.^{5,6}

Rates of childhood obesity in Canada have almost tripled over the past 20 years. The prevalence of obesity among 7-13 year olds rose from 15% in 1981 to 17% in 1996 for boys and 15% for girls. Canadian children are considerably more likely to be overweight than their English, Scottish and Spanish peers. The probability of childhood obesity persisting into adulthood is estimated to increase from

approximately 20% at four years of age to approximately 80% by adolescence.⁷

Management of childhood obesity

Causes of childhood obesity are multifactorial, although unhealthy diet and sedentary lifestyle are major factors. Only a small percentage of childhood obesity is associated with hormonal or genetic defects. The best way to significantly affect the prevalence of obesity is to prevent it. Therefore, the issue of obesity should be addressed in well-child clinics, especially to children with risk factors. Parents should know that both bottle and breast-fed infants could be overfed, although overfeeding is more common in infants fed by bottle. Parents should respect their child's appetite and understand that it is not necessary for an infant to finish every bottle. Breast feeding and delaying the introduction of solid foods may decrease the risk of future weight problems.

Skimmed milk can safely replace whole milk after two years of age. Food should not be used for non-nutritive purposes such as comfort or reward. Children should not be offered sweets as a reward for finishing a meal. Family meals should be oriented towards a healthy diet with 30% or less of calories derived from fat. Parents should limit the amount of television that the child is allowed to watch and should encourage active play in its place. Regular family activities such as walking, swimming and cycling should be established.⁸

School-based intervention

School-based efforts have been oriented towards prevention, targeting all students in selected classes to avoid stigmatisation. Planet health is an interdisciplinary curriculum that aims to decrease dietary fat consumption, increase consumption of fruits and vegetables, promote physical activities and limit television time. The intervention was attributed to reduced television viewing and the prevalence of obesity significantly decreased among girls, but not boys.⁹ The APPLES (Active Programme Promotion Lifestyle Education in School) intervention involved nutritional education, provision of healthy cafeteria lunches, a fitness programme, improved playground facilities and extracurricular activities. Implementation elicited an increase in vegetable consumption, but did not favourably alter other targeted behaviours or BMI.¹⁰

The Pathway Programme was introduced for American-Indian children who are at high risk for cardiovascular disease

and type 2 diabetes. The aim of the programme was to reduce dietary fat consumption and augment physical activity. Preliminary reports state that a three year programme produced a significant decrease in fat consumption and trend towards increased physical activities, but the BMI did not differ between groups.¹¹ The CATCH (Child and Adolescent Trial for Cardiovascular Health) intervention used a similar approach to Pathways, although it was not specifically designed for obesity prevention. It also aimed to reduce fat consumption and increase physical activity.¹²

Setting goals for weight loss

Weight loss goals should be obtainable and should allow for normal growth. Goals should initially be small, so that the child does not become overwhelmed or discouraged. A reasonable first goal is 5-10lb or, if preferred, a rate of 1-4lb/month can be established.¹³

Dietary management

The child should maintain a food record to aid in dietary assessment. The food diary should include not only the type and quantity of food eaten, but also where it was eaten, the time of day and who else was present. In most cases, the diary will be inaccurate in figuring total calories consumed but will be useful in reviewing problem foods and eating patterns. A straightforward dietary prescription should be offered, keeping in mind that 3,500 calories must be eliminated by diet and exercise to lose 1lb. It is necessary to provide parents with a specific calorie-per-day recommendation that follows guidelines for percentages of fat, protein and carbohydrates. Dietary fibre is also important, as it increases satiety and displaces fat in the diet. Finally, the patient and his family should be referred to a nutritional consultant if this service is available in the community.¹³

Physical activity

Exercise is necessary to maintain weight loss and to redistribute body fat into muscle. It is therefore an essential part of any weight management programme. Initial exercise recommendations should be small and exercise levels should be increased slowly, to avoid possible discouragement. A reasonable goal is 20-30 minutes of moderate activity per day in addition to whatever exercise the child gets during the school day. The National Cholesterol Education Program in the US recommends that physicians consider screening all obese children over two years of age for elevated cholesterol levels.¹⁴

Behaviour modification

Self-monitoring is accomplished by food and activity logs, which force the child to become more aware of his or her eating and exercise patterns. Nutritional education should be aimed at both the child and the family. It should include the components of a healthy diet, an understanding of food labels and the importance of dietary fibre. The patient should be taught that 3,500 calories equals 1lb; there are nine calories per gram of fat and only four calories per gram of carbohydrate or protein.

Stimulus control includes limiting the amount of fattening foods in the house, eating all meals at the dinner table and at

designated times, and serving food only once before putting it away (no second helpings). Parents should not verbally encourage the child to eat, and the child should not be forced to finish the entire meal. Examples of modifying eating behaviour include taking smaller bites, chewing food longer, putting the fork down between bites and leaving some food on the plate.

Family television viewing patterns should be reviewed and modified accordingly. Attitude change involves teaching the child to turn negative self-statements into positive ones and helping him or her to cope with the negative remarks of others. Finally, reinforcements and rewards include verbal praise from the physician and family members, as well as tangible rewards for achieving dietary, activity and weight-loss goals. Rewards should be determined with input from the child, and they should encourage further physical activity, such as sporting equipment.¹⁵

Family involvement

It is important to involve the entire family when treating obesity in children. Many studies have demonstrated a familial aggregation of risk factors for obesity, and the family provides the child's major social learning environment. It has been demonstrated that the long-term (10 year) effectiveness of a weight control programme is significantly improved when the intervention is directed at the parents as well as the child rather than aimed at the child alone.¹⁶

Pharmacological and surgical treatment

Enthusiasm for a pharmacological cure of obesity must be tempered, however, by three observations. First, most drugs used for the treatment of obesity over the past century have had potentially life-threatening complications. Second, because drugs do not produce permanent changes in physiology or behaviour, they are effective only so long as they are taken ('life-long treatment'). Third, the two agents most often used in the treatment of adult obesity, sibutramine and orlistat, produce modest weight loss (3-8%).¹⁷

Four experimental drugs have produced weight loss in small scale studies that involved children with special conditions, namely metformin in obese adolescents with insulin resistance and hyperinsulinaemia,¹⁸ octreotide for hypothalamic obesity,¹⁹ growth hormone in children with Prader-Willi syndrome²⁰ and leptin for congenital leptin deficiency.²¹ At this time, the US Food and Drug Administration approve no anorexiants for use in children. With the current surgical technique of Roux en Y gastric bypass, dramatic weight loss has been reported. However, serious complications of this procedure can result. This approach is best used as a last resort for the severely obese adolescent.

Conclusion

The worldwide prevalence of childhood obesity has raised many-fold in the last two decades. Obese children develop serious medical and psychosocial complications and are at greatly increased risk of adult morbidity and mortality. Prevention of overweight is critical because long-term complication outcome data for successful treatment

approaches are limited. Genetic, environmental or combinations of risk factors predisposing children to obesity can and should be identified. Optimal approaches to prevention need to combine dietary and physical activity interventions. We should identify and track patients at risk by virtue of family history, birth weight or socioeconomic, ethnic, cultural or environmental factors. Recognise and monitor changes in obesity-associated risk factors for adult chronic disease, such as hypertension dyslipidaemia, hyperinsulinaemia, impaired glucose tolerance and symptoms of obstructive sleep apnoea syndrome.

“Many people believe that dealing with overweight and obesity is a personal responsibility. To some degree they are right, but it is also a community responsibility. When there are no safe, accessible places for children to play or adults to walk, jog or ride a bike, that is a community responsibility. When school lunchrooms or office cafeterias do not provide healthy and appealing food choices, that is a community responsibility. When new or expectant mothers are not educated about the benefits of breastfeeding, that is a community responsibility. When we do not require daily physical education in our schools, that is also a community responsibility. The challenges are to create a multifaceted public health approach capable of delivering long-term education in the prevalence of overweight and obesity. This approach should focus on health rather than appearance and empower both individuals and communities to address

barriers, reduce stigmatisation and move forward in addressing overweight and obesity in a positive and proactive fashion,” remarked the US Surgeon General, 2001.

Paediatricians should take a leadership role in this critical area of child health, to help parents, teachers and others who influence the young to discuss health habits. Enlist policy makers from local state, national organisations and school to support a healthful lifestyle for all children.

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