Obesity in childhood and adolescence

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Background. Obesity in childhood and adolescence is increasing in developed countries around the world. Management is often difficult and can be unsuccessful.

Objective. The epidemiology, causes and complications of obesity in childhood and adolescence are described, and a general clinical approach to weight management is provided.

Discussion. In general, a comprehensive history and examination can elicit medical causes of obesity. This paper does not seek to expand on medical causes but rather focuses on the clinical issues dealing with management of the overweight child or adolescent. This approach relies on actively engaging the child or young person, as well as involving the entire family in the process. Weight management consists of a combination of healthy eating behaviour and engaging in physical activity.

Obesity in childhood and adolescence is increasing, yet it continues to be underdiagnosed and undermanaged. Given the numerous adverse short and long term health and psychosocial consequences of obesity, it is important to focus on its management both at an individual and a public health level. This paper discusses the epidemiology, diagnosis, and management of obesity, focusing on family based approaches to weight management.

Epidemiology

The prevalence of overweight and obesity is increasing both in Australia and globally. A recent study by Wake et al showed that the body mass index (BMI) of Victorian primary school children has increased for both boys and girls in the past decade. American studies show that the prevalence of overweight children has increased steadily since the 1970s and data from the 1990 National Health and Nutrition Examination Survey suggest that 22% of children and adolescents are overweight and 11% are obese.

The persistence of obesity into adulthood is influenced by a number of factors, including the severity of the disease, the age at which a child becomes obese and the presence of obesity in at least one parent. After age three, the likelihood of obesity persisting into adulthood increases with the advancing age of the child and is higher in children with severe obesity at all ages. After age six, the probability of obesity persisting into adulthood exceeds 50%; 70-80% of obese adolescents will become obese adults. The presence of obesity in at least one parent increases the risk of persistence at all ages.

The body mass index

The BMI is used to define obesity:

BMI = weight (kgs) / height^2 (m^2).

Overweight is usually defined as a BMI above the 85th percentile for age and obesity as a BMI above the 95th percentile for age. Although BMI is not as reliable a measure of body fat for children compared to adults (as a given value has different implications for body composition depending on age), it is still the most appropriate and widely used measure in clinical practice and research. BMI percentile charts should be used to plot weight in obese children.

Causes of obesity

Medical

Only a small percentage of childhood obesity is associated with a specific medical cause (Table 1). A careful history and examination can usually exclude a medical cause of obesity.

Table 1. Syndromes associated with childhood obesity

Alstrom-Hallgren syndrome
Carpenter syndrome
Cohen syndrome
Cushing's syndrome
- idiopathic
- iatrogenic

Growth hormone deficiency
Hypothyroidism
Hypothalamic dysfunction or tumour
Laurence-Moon-Biedl syndrome
Prader-Will syndrome
Pseudohypoparathyroidism
Turner's syndrome.

Environmental

The family and home environment are often implicated in the development of childhood obesity. Twin and adoption studies have consistently shown that 20-50% of the variation in body fat cannot be explained by genetic factors.

There is considerable evidence that children are becoming more sedentary. A number of studies highlight the association between television viewing and childhood body fat, with a dose-response relationship between the number of hours of television viewing and the incidence of

obesity. Low levels of physical activity in children are also influenced by the amount of physical activity undertaken by parents. Children with two active parents were six times more likely to be active compared to children with parents who aren't active.

The type of food eaten by children and adolescents has also changed significantly in recent decades. Families and children in school today consume higher levels of fat-rich fast foods than in the past. Parental preferences and habits usually influence the food preferences of their children.

Social factors

Social deprivation may predispose children and adolescents to the development of obesity. Lissau et al showed a nine-fold increase in obesity in neglected children.

Complication of obesity

Medical

The medical consequences of obesity can cause significant morbidity in children and adolescents. These include high levels of cholesterol, low density lipoprotein and triglyceride levels, and low levels of high density lipoprotein. Glucose intolerance is becoming increasingly common, as highlighted by the increasing rate of type 2 diabetes in the adolescent population in the USA. Live enzyme increases may occur in childhood obesity. Cholelithiasis, although uncommon in childhood, is often associated with obesity in adolescence. As in adults, cholecystitis may be associated with weight reduction in adolescents. Obesity is frequently associated with polycystic ovarian disease although the pathophysiology is complex. The association of obesity, hyperandrogenism, acanthosis nigricans and hyperinsulinaemia is well described in young women.

Hypertension is seen less frequently in children. However, in one study, almost 60% of children with persistently elevated blood pressure had relative weights of more than 120% of the median for their sex, age and height. Sleep apnoea is a rare but important consequence of obesity that requires prompt management. Pseudotumor cerebri is a rare condition and in up to 50% of child sufferers it is characterised by raised intracranial pressure with obesity. Orthopaedic complications such as slipped upper femoral epiphysis and Blount disease are also more common in overweight children.

Psychosocial

Psychosocial consequences of obesity are common and account for most of the morbidity experienced in childhood and adolescence. Overweight children are often taller than their peers and are often mistaken as older than their actual age. This may lead to frustration or a sense of failure on the part of the young person when they cannot perform at the expected level. This has the potential to disturb the socialisation process of young people, who may respond by becoming

less comfortable in developing relationships outside of their family.

The association of poor self-esteem with obesity, seemingly intuitive, is not as obviously demonstrated in the literature. While some studies show lower levels of self-esteem among obese children, others report more typical levels. Gortmaker et al showed that overweight adolescent and young adult women:

- ➤ completed fewer years of school,
- ➤ were less likely to have married,
- ➤ had lower household incomes and higher rates of household poverty than their non-overweight peers.

These findings were independent of their socio-economic origins and aptitude test scores. Men were less likely to have married. There was no evidence of an effect on self-esteem.

Preoccupation with weight is common in both normal weight and overweight young women. Patton et al showed that 60% of 15 year old girls in a representative Victorian cohort of adolescents dieted at a moderate level and were five times more likely to develop a new eating disorder than girls who did not diet. In another Victorian study, only 54% of 16 year old girls correctly estimated their weight: the others tended to consider themselves overweight.

Important issues in evaluating the obese patient

Engage the patient

Being non-judgmental and open minded at all times is crucial when dealing with overweight young people and their families. The process of engaging the older child or adolescent in a therapeutic relationship is essential to elicit sensitive information. Suggestions for successful engagement with a young person are highlighted in Table 2.

History and examination

A thorough history and examination will help elucidate whether medical causes of obesity need to be actively excluded. In general, short stature or growth failure characterise obesity due to an underlying medical cause. Young people with non-medical obesity are often above the 50th percentile for height and age. The complications of obesity must be considered during a review of systems. A history of smoking in adolescence is crucial as it has important implications for cardiovascular risk. Ensure an accurate reading of blood pressure using a cuff that covers two-thirds of the child's arm.

Take a dietary history to determine family patterns of eating behaviour as well as their attitude to helping their child lose weight. This should include the availability of junk food in the home, attitudes to snacking and knowledge of healthy nutrition. Ask about the amount of physical

activity undertaken by all family members, not just the patient. Ask specifically about the amount of television viewing and computer use.

Table 2. Techniques to engage adolescents and older children

➤ Introduce yourself to the adolescent rather than the parents. Then ask the young person to introduce their parents to you.

➤ Discuss your approach to confidentiality during the introductory discussion. This includes an assurance of confidentiality with the important exceptions of suicidal, homicidal or abuse risk.

➤ Discuss in detail what the young person can expect from the consultation.

➤ Provide information to help out weight issues into a family context.

➤ Include the young person in the decision to involve parents in any management plan.

➤ Identify and be sensitive to the psychosocial consequences that may accompany obesity in adolescence.

➤ Avoid being judgmental.

History taking in adolescents should focus on previous dieting attempts, body image concerns and a thorough psychosocial assessment to elicit risk and protective factors in the young person's life and any coexistent health risk behaviours. It is important to consider an underlying eating disorder, as binge eating disorder can occur in up to 30% of morbidly obese girls.

Which investigations?

Investigations can identify children and young people with complications of obesity. These include:

➤ a serum lipid profile

➤ liver function tests

➤ glucose levels

➤ LH/FSH ratio.

Radiology should be performed if there is any limping, pain or bowing of the legs to exclude slipped upper femoral epiphysis or Blount disease. Abnormal results rarely motivate children and adolescents to lose weight, and may serve as points of conflict between parents and their children.

Treatment

The primary goal of treatment is the regulation of body weight with adequate nutrition for growth and development. Obesity is usually a family rather than an individual issue, as family patterns of eating and activity influence the weight of children and adolescents. Obesity in

childhood may reflect lack of limit setting in families; in adolescence it may reflect more significant family discord, boredom, or depression. Even as adolescents develop into individuals with increasing responsibility, families are still involved in many food choices made by adolescents. Active involvement of families is therefore encouraged.

Dietary approach

The basic principles of dietary management of obesity incorporate healthy eating patterns, as illustrated by the healthy eating pyramid. This advocates liberal use of cereals, breads, vegetables and fruits, moderate use of dairy products, lean meat, poultry, fish, nuts and eggs, and less use of sugar, butter, margarine and oils. Healthy eating patterns aim for a fat intake of 30% of total energy intake. The Australian Dietary Guidelines for children are also useful for families to promote healthy weight management (Table 3).

Table 3. Australian Dietary Guidelines for Children and Adolescents

1. Encourage and support breastfeeding.
2. Enjoy a wide variety of nutritious foods.
3. Eat plenty of breads, cereals, vegerables and fruit.
4. Low fat diets are not suitable for young children. For older children, a diet low in fat, and in particular, low in saturated fat, is appropriate.
5. Maintain a healthy body weight by balancing physical activity and food intake.
6. Water is the preferred drink for children.
7. Eat only a moderate amount of sugars and food containing added sugars.
8. Choose low salt foods and use salt sparingly.
9. Eat foods containing calcium.
10. Eat foods containing iron.

Exercise

While any form of exercise has undisputed health benefits, exercise alone has not been shown to reduce weight. In combination with a healthy diet, lifestyle activity, rather than aerobic activity has been shown to be more effective in weight control. Those participating in lifestyle activity also report more positive attitudes towards exercise, making it more likely that lifestyle activity will be sustained. Robinson documented a decrease in BMI simply by encouraging primary school students to reduce the amount of television viewing and video game use.

Parents can encourage physical activity in their children by being supportive and positive, especially if they become involved in lifestyle activities along with their children. Families need to be serious about wanting to change in order to maintain the motivation to engage in physical activity. However, maintaining a realistic outlook on what children can accomplish is important in fostering sustained participation in any activity program. Parents can help de-emphasize the concept that exercise and activity have been prescribed by the doctor and instead, focus on activities that are fun. Praise and reward from parents is essential to the success of any lifestyle

activity program.

Family approach

General parenting skills are very important in the management of overweight children. Epstein et al showed the 10 year effectiveness of a weight control program was significantly improved when the intervention was aimed at the parents as well as the child, rather than the child alone. General parenting skills relevant in weight management include:

- ➤ be consistent and avoid mixed messages
- ➤ be aware and observant of children's behaviour so that desired behaviours are positively reinforced
- ➤ offer direct praise at children's behaviour, rather than their personal attributes
- ➤ model desired behaviours, including strategies for dealing with setbacks
- ➤ set limits for behaviours when necessary.

Parents are well placed to respond to age specific issues associated with overweight or obesity. Issues of self image and self worth often become apparent in primary school years where teasing is common at school. Children who are accepted and loved unconditionally often develop higher self worth, knowing they have strong allies in their parents. This may help mitigate criticism or teasing from peers. Parents can help provide effective strategies for managing teasing behaviour rather than helping the teased child cope with teasing.

Adolescence presents further challenges to parents in managing obesity. Adolescence is a time of rapid change and experimentation but adolescents continue to need a strong connection to their family. This provides constant support during a period of increasing independence and maturity. Strategies for parents to manage overweight young people include providing them with appropriate information to make healthy food and activity choices, keeping communication channels open, trying to identify with the adolescent's position, and loving them unconditionally.

Controlling the environment

Most behavioural treatments promote changes to the environment to help reduce opportunities for calorie intake and increase opportunities for physical activity. Examples include stocking the kitchen with healthy foods, avoiding 'junk food' and reducing the hours of sedentary activity.

Self monitoring

Children should be encouraged to monitor their food intake and activity levels. This information can be helpful in setting goals, assessing progress, providing feedback and rewarding success.

Goal setting and contracting

Setting short term goals may be helpful to establish and maintain behavioural change, rather than focusing on weight loss. Weight maintenance is a more realistic goal in growing children and adolescents than weight loss. Longer term goals usually involve achieving a desired weight, and overweight children and their families need to accept that this may be harder to do than initially thought.

Maintenance and relapse prevention

Weight gain after initial loss is common. It is therefore important to have strategies that promote maintenance and prevent relapse. These are not well developed or evaluated, but usually include planning ahead, identification of weight gain and reinstitution of the previous weight management program.

The role of the general practitioner

General practitioners are well placed to support young people and their families in their weight management endeavour. This includes the development of practical strategies and planning of a healthy eating and activity program. Establishing a strong non-judgmental relationship with the over-weight child or adolescent is crucial to maintain motivation and to encourage children and young people to attend sessions. Similarly, parents need emotional support and a non-judgmental approach to empower them to be more effective and supportive parents.

If there is any concern that the obesity may be medical in origin, appropriate investigation and referral to specialty services should occur. If the clinical approach taken is not working, referral to a specialty paediatric or adolescent service may be useful. Specialty units generally use a multidisciplinary approach to manage obesity.

Conclusion

Obesity is a significant problem globally with serious medical and psychosocial consequences. A holistic approach involving the individual and family is the most effective approach to weight management and maintenance.

Summary of Important Points

➤ The prevalence of overweight and obesity is increasing in Australia.

➤ The medical consequences of obesity (such as hypercholesterolaemia and hypertension) can cause significant morbidity in children.

➤ Overweight children are more likely to have impaired socialisation than their non-overweight peers.

➤ The management of obesity is a family, rather than an individual issue.

➤ The primary goal of treatment is weight regulation, with adequate nutrition for growth and development.

➤ Healthy eating and physical activity are the keys to effective weight control.

➤ Parenting skills are important in helping support children and adolescents through weight management and beyond.