Childhood obesity

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Abstract

Obesity is a common childhood disease with well-recognized health consequences, both during childhood and adulthood, affecting health and psychological welfare. Clinicians working with obese children should have knowledge of the components of a healthy lifestyle and understand the importance of interacting with the child and family in a positive, empathetic and non-judgemental manner. Most parents will be unaware of the impact of obesity in childhood and adolescence and many parents may even be unaware that their own child is obese. Royal College of Paediatrics and Child Health (RCPCH) body mass index (BMI) centile charts with the recommended cut-off points should be used to diagnose childhood obesity. Evidence-based clinical guidelines conclude that treatment programmes should be multi-component, targeting changes in diet, physical activity and sedentary behaviour (screen time). The use of behavioural change strategies is consistently recommended in evidence-based guidance on management. Guidelines suggest that in the case of severe to extreme obesity in adolescents with co-morbidities, anti-obesity drugs and bariatric surgery may be considered as part of a treatment plan.

Keywords Adolescents; body mass index; body weight; childhood; obesity; treatment

What's new?

- Management programmes should use behavioural change tools
- Intervention in the early years is becoming a priority
- RCPCH new UK/WHO growth and BMI centile charts should be used in the UK for diagnosis and monitoring of interventions
- In extreme obesity, for adolescents with severe co-morbidities, bariatric surgery could be considered

Childhood obesity is widely acknowledged as having become a global epidemic.[1,2] The prevalence of childhood obesity in the UK dramatically increased over a short period of time in the early 1990s.[3,4] English data shows that appropriately one-third of children aged 2–15 years are either overweight or obese and that children in the lowest socioeconomic status (SES) are almost twice as likely to be obese compared with those in the highest SES.[5] Doctors in primary, secondary and tertiary care are now more likely to see obese children and adolescents in their everyday practice.

Definition

A definition of childhood overweight and obesity needs to be able to define the clinical relevance of excess body fat. Body mass index (BMI) is generally agreed to be the most appropriate proxy measure for body fat, and thus for defining and diagnosing childhood obesity and overweight.[6–8] In childhood, because body fat and muscle mass alter with age and differ between the sexes, BMI is meaningful only when it is plotted correctly on age- and sex-specific BMI centile charts. Therefore, BMI centile charts should be used by all health professionals working with children for diagnosis and monitoring of treatment of childhood obesity.[6,7]

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For use in the United Kingdom (UK) growth and BMI centile charts have been developed by the Royal College of Paediatrics and Child Health (RCPCH) and are available from Harlow Printing Ltd, South Shields, England (see assessment). Both SIGN 115 (2010) and NICE 47 (2013) guidelines recommend cut-off points for clinical definition of overweight as ≥91st centile and for obesity as ≥98th centile, while SIGN 115 defined ≥99.6th centile as severe obesity.[6,7] Importantly, these cut-off points have been shown to be relevant to excess body fat and associated ill-health consequences.[6,7,9]

Aetiology

An understanding of the complex aetiology of childhood obesity is helpful, to appreciate the changes required to manage obesity in childhood. The causes of obesity are complex and multifactorial, involving an interaction of our modern, obesogenic environment and individual lifestyle choices. Because excess weight gain occurs in a state of positive energy balance, increases in the amount of calorie-dense foods eaten, and increases in screen time (television, computer, tablets, mobile phones and video games) with a simultaneous decrease in the amount of physical activity undertaken by children have been cited as reasons for the current epidemic.[10,11] The understanding of the role of genetics in the predisposition of some individuals to gain excess weight has improved in recent years.[12] However, for the vast majority of obese children, this has not yet impacted on day-to-day clinical practice.[13]

There is an increasing emphasis on interventions in the early years to prevent excessive weight gain in the pre-school years. Clinicians may wish to consider the following family behaviours and risks factors for overweight and obesity in the early years when consulting with parents:

- parental obesity
- very early high BMI or adiposity rebound
- more than 8 hours watching television (TV) per week at age three
- catch up growth
- excessive weight gain in the first year
- birth weight
- short sleeping duration at age 3 years.[14]

Consequences

There is good evidence that childhood obesity persists (or tracks) into adulthood,[15–18] the likelihood increasing markedly for obese teenagers. A number of consequences of childhood

obesity are seen in childhood, adolescence and later in life. Clustering of cardiovascular risk factors has been reported in children and adolescents: these comprise high blood pressure, dyslipidaemia, abnormalities in left ventricular mass and/or function, abnormalities in endothelial function, and hyperinsulinaemia and/or insulin resistance. A body of evidence suggests that these cardiovascular risk factors are seen in adults who were obese children or adolescents.[13,15] There are also instances of insulin resistance, type 2 diabetes mellitus and fatty liver disease in obese adolescents.[13,16,17] Psychological problems, particularly in girls, have been reported in relation to low self-esteem and behavioural problems. There are also long-term consequences of social and economic effects, particularly in women achieving a lower income.[15,18] Table 1 gives a list of consequences of obesity in children and adolescents that clinicians should consider.

Assessment

If there are concerns that a child or adolescent may be overweight or obese, baseline measurements of weight and height should be obtained and plotted on weight- and height-growth centile charts. BMI should be calculated, and plotted at the correct age on the appropriate centile chart for sex. For use in the UK the RCPCH has a suite of charts:

- 0–4 years UK WHO growth chart with BMI centile 'look up' and an adult height predictor
- 2–18 years UK growth chart with guidance on onset and progression of puberty, a BMI 'look up', an adult height predictor and mid-parental height comparator
- 2–18 years Childhood and Puberty Close Monitoring (CPCM) chart includes a BMI centile chart
- 2–18 years BMI centile chart.[5]

Consideration should be given to children and adolescents who are obese but also of short stature, as this may be an indication of a possible underlying endocrine cause of their obesity, such as hypothyroidism, growth hormone deficiency, Cushing's syndrome or pseudohypoparathyroidism. Referral to a paediatric endocrinologist should always be made for further investigations.[7,13] Young children, particularly those under 2 years who have had a rapid weight gain, are severely obese and appear to be hyperphagic, may have one of the rare single-gene defect causes of their obesity and further investigations would be advisable.[12]

Consequences of childhood obesity[2,13,15]

- Cardiovascular disease
- Insulin resistance and type 2 diabetes
- Dyslipidaemia
- Hypertension
- Psychological and social morbidity
- Asthma
- Impaired fertility
- Orthopaedic – hips, ankles
- Breathing problems and sleep apnoea
- Fatty liver disease
- Some cancers
- Acceleration of puberty in both girls and boys
- Persistence of obesity into adulthood

Table 1

Discussing the subject of weight

There is a large body of evidence that shows many parents do not recognize overweight and even severe obesity in their own children.[19–21] This can make the discussion of weight with families daunting for clinicians and health professionals. Recent work tells us that this should be approached directly, first with the parents in an empathetic and non-judgemental manner.[20,22,23] Parents should be asked in a stepwise manner if they consider their child's weight a problem? Do they wish to do any thing about their child's weight? And what changes they feel ready to make?[22] Parents perceive a dialogue around their child's physical activity levels as less threatening and less judgemental of their parenting than questioning about their eating habits.[23] NHS Health Scotland have a very good on-line interactive programme for discussing weight call 'raising the issue of child-healthy weight'.[24]

Management

Management of childhood obesity is multifaceted, with interventions made complex by the interaction of the child or adolescent with their parents and families. Parental weight is known to influence the weight and lifestyle of the children in a family, so the involvement of parents is fundamental to any childhood weight-management programme.[7,25] Recent guidelines and the Cochrane review on childhood obesity showed a consensus on the following points:

- treatment should be commenced only when the parents are ready and willing to make lifestyle changes
- treatment should be family based, with at least one of the parents/carers involved.[6,7,26]

Table 2 summarizes the advice that should be given to children, young people, their parents and families. It is important to emphasis that changes in total energy intake, screen time and physical activity are all of equal importance in childhood weight management.[7] Some families are able to make positive changes when given simple advice but the majority of children and parents will need to attend an on-going group or individual programme over a number of months. From current evidence, the optimal length of a weight-management programme is unclear[7] but programmes that include the use of behavioural change tools would appear to be beneficial.[6,26] Clinicians should be aware of their local childhood weight management programmes and referral pathways.[6,7]

Outcomes

Weight maintenance in combination with increasing height growth is an acceptable goal of treatment as this will lead to BMI decreasing over time. For older adolescents, particularly those in the very severe BMI range, weight loss may be required; if so, a weight loss of 0.5–1 kg per month would be advised.[7] Most research projects report outcomes as change in BMI standard deviation scores (SDS). There is emerging evidence and debate