# The obesity epidemic in children and adolescents

**Dr Sonia Grover**
FRANZCOG

**The number of children and adolescents in Australia who were considered overweight or obese in 2003 was one in four. This was double the rate of overweight children and triple the rate of obese children compared to a decade earlier.[1,2,3]**

It was tempting to write a purely 'medical article' on obesity in children and adolescents to ensure that you don't miss the syndromes such as Prader-Willi and Beckwith-Weidemann. Or to tell you how to recognise polycystic ovary syndrome (PCOS) in adolescents and the challenges in applying the adult diagnostic criteria to an adolescent population. Or to draw up a table of investigations for you to order to exclude conditions such as Cushings disease and hypothyroidism. However, I am going to focus on the enormous problem of the obesity epidemic in childhood and adolescents instead. Despite the play on words, this is truly a very large problem.

*'It is time that we took an active role in the battle regarding childhood and adolescent obesity, where mothers continue to have an important input and influence.'*

This is a problem that requires us to consider broad medical, social, community and government approaches and legislation that have been utilised to tackle other health problems in the past few decades – such as tobacco, motor accidents and asbestos morbidity and mortality. In the case of tobacco, it was our respiratory and thoracic surgeon clinical colleagues who played a key role. For motor accidents, it was the College of Surgeons and the trauma surgeons who played a pivotal role in raising awareness. In the case of childhood obesity, I think we and our paediatric colleagues cannot hide from our responsibility.

If your thoughts at this stage are that you as primarily an obstetrician and gynaecologist providing adult care have little role to play, I plead with you to continue to read, as I do not think you should shirk your responsibility quite so readily.

Obesity in childhood is likely to be lifelong. (Obesity is defined as a body mass index [BMI] of greater than the 95th centile and overweight is a BMI greater than the 85th centile.) Although the persistence of childhood obesity into adulthood is sometimes difficult to predict, some factors are clear. Of preschool children who are obese, persistence into adulthood occurs in 25 per cent.[4] In contrast, persistence rates of 50 per cent occur in the obese six-year-old. Obesity of one parent in an obese 16-year-old predicts an 80 per cent chance of adulthood persistence.[5] There is concern that, as children and adolescents become more sedentary, even these figures are likely to be an underestimate. Parental obesity more than doubles the risk of obesity in non-obese and obese ten-year-olds.[5] Girls are more prone to develop obesity during adolescence than boys, as pubertal hormonal changes result in a reduction of body fat content in boys and an increase in girls. Approximately 80 per cent of obese adolescent females will remain obese compared to 30 per cent of obese adolescent males.[6,7]

Why has this problem with obesity occurred? The predominant cause for obesity is an energy imbalance – a relative increase in energy intake with a more sedentary lifestyle. Television-watching in children and young adults correlates to obesity more so than computer games, possibly because television comes with food advertisements. High energy foods, in particular sweet soft drinks, fruit juices and high sugar snack bars, are an obvious source of excess calories. Urban design changes with larger houses, resulting in distances to the local school and shops now considered too great for walking or cycling with a dependence on the car, combined with a lack of child-friendly physical and social environments are also critical contributing factors.[8]

Obese children are at increased risk of poor self-esteem. Those obese children with poor self-esteem are more likely to drink alcohol and smoke as adolescents.[9] The obese adolescent girl is at risk of being bullied at school. At an individual level, these issues need to be identified and tackled.

The long-term risks of obesity for children and adolescents are not dissimilar to adults. Previously, conditions such as type 2 diabetes and gall bladder disease were never seen in this age group. Impaired glucose tolerance and type 2 diabetes require early recognition and intervention to delay the development of further complications, including progressive neuropathy, retinopathy, nephropathy and atherosclerotic cardiovascular disease. The metabolic syndrome is a cluster of metabolic risk factors (abdominal obesity, hypergycaemia, dyslipidaemia and hypertension) for type 2 diabetes and atherosclerotic cardiovascular disease in adults. Although the clustering also occurs in adolescents, there are some difficulties both in confidence of the persistence and the significance of the individual aspects in this age group. Nevertheless, work on interventions in this age group is occurring and is suggestive that similar medical approaches may be appropriate.[10]

From the perspective of an obstetrician and gynaecologist's work, the impact of this obesity problem currently occurring in children and adolescents will translate into more women presenting with PCOS. It should be noted that not all adolescent or adult women with obesity have PCOS or markers of the metabolic syndrome and not all subtypes of PCOS seem to be at increased risk of metabolic syndrome.[11] We will be caring for more women with infertility problems and gestational diabetes and seeing increasing rates of endometrial hyperplasia and endometrial cancer. The risks associated with undertaking surgery in both our obstetric and gynaecology patients will rise with both increased morbidity

and mortality. The endometrial cancer rate is known to increase significantly for each 5 kg/m$^2$ increase in BMI (RR 1.59, 96% CI 1.50-1.68).[12] Likewise, a 30 per cent increased risk for bowel cancer has been reported in people with type 2 diabetes (RR 1.30, 95% CI 1.20-1.40)[13] and for women with a BMI greater than 29, a 1.45-fold increased risk of colon cancer compared to women with a BMI less than 21 is already known.[14] This study (*Nurses' Health Study*) also showed that physical inactivity was a risk factor.[14]

My clinical questions to a teenager with hirsuitism and obesity or to the child with vulvovaginitis, who also happens to be obese and have acanthosis nigricans, will automatically include questions regarding diet and exercise.[15] The dietary history includes exploring who shops and cooks in the household, the identification of food which is high in calories and low in nutritional value that can be readily reduced or eliminated (for example, soft drinks, fruit juice, high energy bars) and an assessment of eating patterns (timing, content and location of meals and snacks). An activity history includes questions regarding barriers to riding or walking to school (or work), evaluation of physical activity at school, after school and during weekends and assessment of 'screen time' (television, computer study and games).

These questions can also be adapted to the female adult you are seeing with obesity and infertility or heavy menses. Likewise, the postpartum mother in whom you have managed their gestational diabetes or obesity during pregnancy needs these questions – not just for her sake but for her children, with the opportunity used to educate about the risks to her and her children regarding the risk of being obese and the associated co-morbidities. It is useful to put the emphasis on increasing activity levels and aiming for reasonable target weight reduction, as often, many of the metabolic consequences are reduced with only a five per cent reduction in weight.

*'As obstetricians and gynaecologists we can take a political role regarding good nutrition and inappropriate food advertisements, by voicing our concern regarding lack of public transport and encouraging more active means of transport.'*

As obstetricians and gynaecologists, we actively intervene on behalf of the baby by encouraging reduced smoking and alcohol intake in the pregnant woman; by undertaking caesarean sections; and by giving steroids to prevent respiratory distress syndrome. It is time that we took an active role in the battle regarding childhood and adolescent obesity, where mothers continue to have important input and influence.

This role can be carried out through our care of the obese adolescent, including acknowledgement and intervention for poor self-esteem and possible depression. Usually, this will involve the participation of parents, who are likely to have the same health concern. We can also play a wider role in educating our pregnant and postpartum patients.

When our community tackled the problem of tobacco-related morbidity and mortality, what was the response then? As a community, we accepted taxes specifically on tobacco; put clear warnings on the packaging; banned cigarettes progressively from public places; tried to limit the access of children to cigarettes; established a public advertising campaign trying to ensure that the message reached individuals; and have banned tobacco advertisements. As obstetricians and gynaecologists, we can take a political role regarding good nutrition and inappropriate food advertisements, by voicing our concern regarding lack of public transport and encouraging more active means of transport. We do know the consequences of this obesity epidemic in children and adolescents. We will have to deal with it and we would be smarter if we started to work towards interventions at their origins in childhood and adolescence.

**References**


1. Booth ML, Wake M, Armstrong T, *et al*. The epidemiology of ove weight and obesity among Australian children and adolescents, 1995-1997. *Aust N Z J Public Health* 2001; 25: 162-169.
2. Magarey AM, Daniels LA, Boulton TJ. Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 data against new standard international definitions. *Med J Aust.* 2001; 174: 561-565.
3. Booth ML, Chey T, Wake M, *et al*. Change in prevalence of overweight and obesity among young Australians, 1969-1997. *Am J Clin Nutr.* 2002; 77: 29-36.
4. Garn SM, LaVelle M. Two-decade follow-up of fatness in early childhood. *Am J Dis Child* 1985; 139:181-5.
5. Whitaker RC, Wright JA, Pepe MS, Seidel KD, Dietz WH. Predicting obesity in young adulthood from childhood and parental obesity. *N Engl J Med.* 1997; 337:869-73.
6. Garn SM, Cole PE. Do the obese remain obese and the lean remain lean? *Am J Public Health* 1980; 70:351.
7. Mellits ED, Cheek DB. The assessment of body water and fatness from infancy to adulthood. *Monogr Soc Res Child Dev.* 1970; 35:12.
8. Waters E, Goldfeld S, Hopkins S. Indicators for child health, development and wellbeing. An evidence based review of the international literature on population child health and wellbeing indicators. Melbourne: Centre for Community Child Health, 2002.
9. Strauss R. Childhood obesity and self-esteem. *Pediatrics* 2000; 105: e15.
10. Srinivasan S, Ambler GR, Baur LA, Garnett SP, Tepsa M, Yap F, Ward GM, Cowell CT. Randomized, controlled trial of metformin for obesity and insulin resistance in children and adolescents: improvement in body composition and fasting insulin. *J Clin Endocrinol Metab.* 2006 Jun;91:2074-80.
11. Shroff R, Syrop CH, Davis W, Van Voorhis BJ, Dokras A. Risk of metabolic complications in the new PCOS phenotypes based on the Rotterdam criteria. *Fertil Steril.* 2007 ;88:1389-95.
12. Renehan AG, Tyson M, Egger M, Heller RF, Zwahlen M. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. *Lancet* 2008 ;371:569-78.
13. Larsson SC, Orsini N, Wolk A. Diabetes mellitus and risk of colorectal cancer: a meta-analysis. *J Natl Cancer Inst.* 2005 ;97:1679-87.
14. Martinez ME, Giovannucci E, Spiegelman D, Hunter DJ, Willett WC, Colditz GA. Leisure-time physical activity, body size, and colon cancer in women. Nurses' Health Study Research Group. *J Natl Cancer Inst.* 1997 ;89:948-55.
15. Dietz WH, Robinson TN. Clinical practice. Overweight children and adolescents. *N Engl J Med.* 2005 ;352:2100-9.