

Editorial

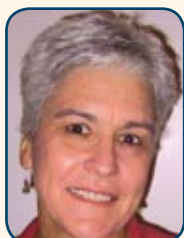
The increasing incidence of overweight and obesity in children is a major health concern. As treatment can be challenging, prevention is essential. While prevention strategies commonly focus on poor nutrition and lack of physical activity, there is growing interest in the role of birth size and postnatal growth. Birth size reflects the intra uterine environment and prenatal growth of the infant and has been associated with increased fatness, early puberty and increased risk of cardiovascular disease and type 2 diabetes in later life.

In this issue of Heinz Sight Dr Sarah Garnet discusses the role of birth size and postnatal growth and its relationship to obesity.

Penelope Stone APD
Consultant Dietitian / Nutritionist
Heinz Infant Feeding Advisory Service

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Dr Sarah Garnett is an NHMRC Australian Clinical Research Fellow, Division of Research, The Children's Hospital at Westmead. Sarah's primary research interest is in body composition, including bone, obesity and insulin resistance in young people. Her main research study over the last 15 years has been the Nepean Longitudinal Study; a study that has been designed to explore foetal and mid-childhood influences, including family and home environment, on obesity and metabolic risk in contemporary Australian adolescents. This is essential information for obesity prevention and intervention programs.

Birth Size, Postnatal Growth and Obesity

Nepean Longitudinal Study

The children involved in the study were born full term at the Nepean hospital in Penrith, western Sydney between August 1989 and April 1990.¹ To date, the children have been seen four times since birth; at 8, 13, 15 and 17 years.

Both children and parents were measured in terms of:-

- Height, weight and waist circumference
- Fat, lean and bone by dual energy x-ray absorptiometry (children only)
- Physical activity (questionnaires and accelerometers)
- Food intake (food records and food frequency questionnaires)
- Family physical activity and food environment

Other chief investigators on the project include Associate Professor Chris Cowell and Professor Louise Baur.

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Overweight and obesity in childhood

Over the last twenty to thirty years overweight and obesity have risen at an alarming rate. It is estimated that at least one in five Australian children and adolescents are overweight or obese, although exact figures are unknown. The Nepean Longitudinal Study (see box) found that at age 8 years, 16% of boys and 23% of girls were overweight and obese.² Five years later, at age 13 years the prevalence of overweight and obesity had increased to 28% for boys and 29% for girls (Table 1). This was significantly higher than in the 1997 NSW Schools Fitness and Physical Activity Survey where at 13 years of age, 20% of boys and 18% of girls were overweight and obese.³ On a positive note, 80% of children in the Nepean Longitudinal study, who were not overweight or obese at 8 years, continued to have a healthy weight at 15 years of age.⁴

Table 1. Prevalence of Overweight and Obesity in Australian Children aged 8 and 13 Years from the Nepean Longitudinal study

Year	Age	% Overweight and Obese	
		Boys	Girls
1997	8	16	23
2002	13	28	29

Adverse health effects of overweight and obesity

Overweight and obesity have significant adverse effects on health during childhood. Excess weight in an infant may interfere with developmental milestones, such as crawling and walking. Other medical problems, common in obese children are:-

- low self-esteem
- depression
- orthopaedic complications due to excessive weight on joints
- sleep problems
- asthma and
- raised blood sugar levels.

Obese children are also more likely to have risk factors for heart disease such as raised blood pressure and high cholesterol and many become obese adults.

Prevention of overweight and obesity is essential

Once a child is overweight or obese treatment is difficult, so prevention is important. The Nepean Longitudinal Study found that intervention should begin early, preferably before the age of 8 years. To do this effectively, the potentially modifiable factors that influence the development of obesity need to be identified.

Factors associated with overweight and obesity in childhood

• Lifestyle factors

While genetics may play a part in overweight and obesity, more often the cause is related to lifestyle factors, poor nutrition and lack of physical activity. Findings from a number of studies, including the Nepean Longitudinal Study have shown that the strongest and most significant predictors of overweight and obesity in early adolescence are:-

- how fat the child was in mid-childhood
- mother's adiposity
- lack of vigorous activity and
- soft drink consumption.

Children whose mothers were overweight or obese were five times more likely to be overweight and obese than children whose mothers were an ideal body weight.² Drinking an average of half a cup of soft drink a day was also found to lead to unwanted weight gain in children.⁵

In addition to these well known lifestyle factors, there has been a lot of interest in the role of birth size (as an indicator of the intrauterine environment), growth in infancy and childhood, and early puberty.

• Foetal origins of adult disease

The 'foetal' or 'early' origins of adult disease was first described by David Barker and his colleagues from the MRC Environmental Epidemiology Unit in Southampton. The foetal origins hypothesis (also known as the **Barker Hypothesis** and more recently renamed **the developmental origins of health and disease hypothesis**), states that an adverse intrauterine environment, particularly in relation to under-nutrition, may lead to biological programming that influences the development of adult diseases later in life. These adult diseases include cardiovascular disease and type 2 diabetes and their precursors hypertension, dyslipidaemia and impaired glucose tolerance.

The biological basis for this association has been attributed to developmental plasticity and catch-up or compensatory growth. *Developmental plasticity* is the mechanism by which one genotype can give rise to a range of physiological or morphological states in response to different environmental conditions during development, so that the individual is best adapted to the circumstance it is born into. That is, developmental plasticity is a means by which the developing foetus or neonate adapts in response to signals transmitted by the mother about the external environment.⁶

An undernourished foetus, for example, may maintain a high level of glucose in the bloodstream to benefit the brain, but store less in muscles. Muscle growth is 'traded off' to protect the brain. Once adopted, this thrifty behaviour becomes permanent. It is suggested that these adaptations will only lead to type 2 diabetes if the postnatal nutritional environment is more plentiful than the prenatal environment. This may occur if foetal under-nutrition is followed by a period of catch-up growth due to an abundance of nutrients. The developing newborn, as programmed, continues to respond as if it was living in an undernourished environment rather than in a well nourished one.

The intrauterine environment does not change dramatically between generations and may still be markedly constrained especially in developing countries. However, the potential for differences between the pre- and post-natal environments is increasing particularly in many developing countries where high energy foods are now plentiful and energy expenditure reduced. It is suggested that differences between the pre- and post-natal environment may explain the increase in type 2 diabetes and cardiovascular disease seen in some Indian populations. For example in eight year old Indian children, those in the highest risk group were lighter at birth but heavy at eight years.⁸

• Rapid growth

Rapid growth at all ages during infancy (including weight gain during the first week or months of life) and childhood is associated with a greater risk of later obesity. Infants with rapid growth had odds ratios and relative risks of later obesity between 1.17 and 5.70, compared to other infants.⁷

It must be noted that rapid growth is not necessarily catch-up growth. Catch-up growth occurs as a result of nutritional recovery following a period of growth restriction and can only be examined when growth restriction is evident. Few studies have examined the effect of catch-up growth on obesity according to nutritional conditions at birth, and so growth should only be interpreted as the effects of rapid growth.

• Birth size

A general assumption is that the higher the birth weight the more favourable the intrauterine environment. However, there are exceptions, such as foetal macrosomia associated with gestational diabetes. Several studies, including data from the Nepean Longitudinal Study, have shown that lower birth size is associated with early pubertal development⁹, increased risk of cardiovascular disease and type 2 diabetes.²

A high birth weight is also associated with a higher body mass index (BMI) in later life. This association appears to contradict evidence that low birth weight programs for an increased risk of cardiovascular disease and type 2 diabetes. It is important to remember that BMI is a measure of relative weight and does not distinguish between lean and fat mass. There is some evidence that lower birth weight is associated with a subsequent greater abdominal or central fat mass¹⁰ and a higher ratio of fat mass to lean mass.¹¹ In contrast, high birth weight is associated with a relatively greater proportion of lean mass.

The significance of the relation between birth size and adult health

The significance of the relation between birth size and adult health, from a public health perspective in developed countries like Australia, is vigorously debated. Some view the hypothesis as an important issue for public health and preventative medicine. However, it is known from a number of nutritional interventional studies undertaken during pregnancy that modifying birth weight is difficult, except in the extremely malnourished. The effect of increasing birth weight is likely to be modest compared to decreasing childhood and/or adult weight.



It is estimated that a 2 kg reduction in (adult) body weight could reduce systolic blood pressure by 1%. This is equivalent to the expected reduction in blood pressure estimated for a 1 kg increase in birth weight.¹² There is also concern that increasing birth weight may be harmful because of the possible effect of increasing obesity.

Summary

The increasing prevalence of obesity is a serious threat to the health of all Australians. Once a child is overweight or obese it is difficult to treat, so prevention is essential. Birth size has been associated with increased fatness, but it is difficult to modify, the effects of increasing it are likely to be small and the risks are unknown. Implementing obesity prevention programs in early childhood, promoting an active lifestyle and good nutrition, are likely to be more effective public health strategies than efforts directed at increasing birth weight in Australia.

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Heinz Update



Heinz Australian Baby Report

Heinz knows that mums want to provide nutritious meals for their baby using the freshest ingredients. However many find this a real challenge. The recent Heinz Australian Baby Report survey of 314 mums with infants aged 6 -15 months, showed that nine out of ten mothers feel challenged in making baby meals.

Mothers listed lack of time, not being sure that their baby would like it, not always having the right ingredients on hand and not providing enough variety as the major reasons for their concern. Furthermore, eight out of ten mums thought it was difficult to source nutritional advice, citing difficulty knowing which internet sites are reputable as one reason.

When it comes to cooking at home, the most popular meal made by mums Australia wide is mashed vegetables (87%) according to the Report, closely followed by chicken and

vegetables (76%). Fifty seven percent (57%) of South Australian mums rate tuna at the top of baby's menu, while only 27% of Queensland mothers choose tuna.

In response to mum's wish to provide fresh healthy meals appropriate for baby, we have launched a new range of six baby friendly sauces and two iron fortified dry pastas. The new "Cook at Home™" range means that mum can easily create a variety of delicious meals for baby, adding her own fresh meat and vegetables. Cook at Home™ is now available at major retailers nationally.

For copies of the new "Cook at Home" recipe book, please contact your local HIFAS team member, or contact us at www.heinzforbaby.com.au

Heather Ferguson APD

**Dietitian/Nutritionist
HJ Heinz Co. Australia Ltd**

Small Talk



1. Report on the health benefits of breast feeding.

In August, the Standing Committee on Health and Aging from the House of Representatives released its report *The Best Start: Report on the inquiry into the health benefits of breast feeding*. The purpose of the inquiry was to report on how the Commonwealth Government could take a lead role in improving the health of Australians by supporting breast feeding.

Breast milk is the ideal food for infants and provides the best start in life. While 83% of mothers breast feed in hospital, rates fall to 48% at six months and 23% at 12 months. The report looked at the reasons for this fall and made recommendations as to how rates of initiation could be increased and the decline arrested.

Some of the Committee's 22 recommendations are:-

- Implementation of a national strategy to support and promote breastfeeding co-ordinated by the Department of Health and Aging
- Government research funding into the long term health benefits of breast feeding to mother and baby and evaluation of strategies to increase rates of exclusive breastfeeding to six months
- Government funding of the Australian Breastfeeding Association's (ABA) breast feeding helpline
- Investigating the establishment of breast milk banks across Australia
- Adopting the World Health Organisation's International Code of Marketing of Breastmilk Substitutes in place of the current Australian Marketing in Australia of Infant Formula (MAIF) Agreement
- Changing Food Standards Australia New Zealand (FSANZ) labelling requirements for foods for infants (Standard 2.9.2) to be in line with Dietary Guidelines which recommend infants be exclusively breast fed for 6 months. This is currently being reviewed by FSANZ.

The full report, including all submissions and transcripts of proceedings can be downloaded from <http://www.aph.gov.au/house/committee/haa/breastfeeding/report.htm>

2. Perceptions of overweight and obesity by mothers of young children aged 2-5 years

Focus groups with 32 mothers of children aged 2-5 years, conducted by researchers from the University of Sydney's Centre for Overweight and Obesity, found mothers:-

- felt responsible for how their child ate
- were aware their children needed to eat healthy food and keep active but found it difficult due to a variety of reasons including financial constraints, advertising and marketing pressures, lack of play areas
- felt judged by how their child ate and their weight; praise was given if their child ate well but criticised if their child was thin or a fussy eater

- worried about their child being underweight and not eating enough. They spent a lot of time encouraging them to eat more
- thought it was better if their child carried a bit of extra weight or 'puppy fat' rather than be thin; they believed the extra weight would be lost as the child grew.

Feeding children can be an emotional and stressful issue for mothers. Health professionals can assist mothers by acknowledging their anxieties regarding food and weight and by providing them with information and parenting behavioural techniques. These include:- informing them a parents role is not force a child to eat but to provide healthy food – the child decides how much to eat; switch off the TV while eating; serve small portions; don't give treats everyday.

3. Mandatory Addition of Folic Acid to Bread

Food Standards Australia New Zealand (FSANZ) has passed a regulation requiring that most breads be fortified with folic acid². Food manufacturers have two years to make the changes so the regulation will be fully enforced by 2009. Organic breads and those made without yeast such as flatbreads will be exempt.

The mandatory fortification of bread with folic acid is a public health initiative aimed at preventing neural tube defects (NTDs) in infants. Women of child bearing age require 400ug of folic acid daily. While some can be provided by food, to reach requirements, a supplement and fortified foods are needed. Pregnant women and those considering pregnancy will still need information and education on how to meet their folic acid requirements.

4. Pregnant Women need advice on the risks of Listeria in foods

Food Standards Australia New Zealand (FSANZ) is asking health professionals to inform pregnant women about the dangers of Listeria and the adverse effects it can have on them and their unborn child³. Listeria is a bacteria found in nature that can cause serious illness when foods contaminated by it are eaten. During pregnancy it may cause miscarriage, premature birth and still birth. The results of a recent study from the University of Wollongong⁴ found that 57% of pregnant women were unaware of all the foods that could potentially contain Listeria and that about 25% were eating high risk foods.

Listeria may be present in raw foods, pre-prepared uncooked foods (such as prepared salads) or precooked foods (such as cold meats, cold chicken, seafood) which have been kept for some time after cooking. Good hygiene is important in the preparation and storage of foods to avoid Listeria contamination. The FSANZ brochure Listeria In Foods is a must read for all pregnant women. It can be downloaded free of charge from the FSANZ website www.foodstandards.gov.au/_srcfiles/Listeria.pdf. More detailed information for health professionals is also available at www.foodstandards.gov.au/newsroom/factsheets/factsheets2005/Listeriacommonlyaske3115.cfm

Penelope Stone
Editor

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The Heinz Product Info Line 1800 633 333 provides information to callers on Heinz Baby Food products.

All callers are asked to contact the child health service in their state or territory for individual advice.

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