Paediatrics

BRITISH J NUTRITION

Childhood diet influential in lifetime disease risk

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 A range of chronic diseases, including cardiovascular (CV) disease and T2D, have differing prevalences in UK migrant populations.

2 Collected during a cross-sectional survey of CV health in 85 primary schools located in London, Birmingham and Leicester, the authors examined the nutritional composition of south Asian, black African-Caribbean and white European children's diets using 24-hour recalls of dietary intake.

3 Some 2209 children (including 558 south Asian; 560 black African-Caribbean; 543 white European), aged 9–10 years, took part.

4 South Asian children compared with white European children reported higher mean total energy intake, both absolute and as proportions of total energy intake. Vitamin C and D, calcium and iron intakes were lower among south Asian children.

5 Dietary differences were especially marked for Bangladeshi children.

6 Black African-Caribbean children had lower intakes of total and saturated fat, fibre, vitamin D and calcium. The lower total and saturated fat intakes were particularly marked among black African children.

7 The authors concluded that significant differences in nutritional composition exist in the diets of children from different ethnic backgrounds in the UK. These differences may contribute to future differences in chronic disease risk and explain some of the excess T2D risk in adult ethnic populations.

Donin AS, Nightingale CM, Owen CG et al (2010) Nutritional composition of the diets of south Asian, black African-Caribbean and white European children in the United Kingdom: the Child Heart and Health Study in England (CHASE). *Br J Nutr* **104**: 276–85

Childhood nutrition and ethnicity: Setting the scene for chronic disease risk

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Cardiovascular disease (CVD) risk begins in childhood. Research suggests that early damage can be seen in the coronary vessels of young people, children are becoming more sedentary and obesity is leading to type 2 diabetes and dyslipidaemia in children as young as 5 years of age (Berenson et al, 1998; Ehtisham et al, 2004). It is also likely that unhealthy lifestyles are being established in childhood and persisting into adult life.

Tackling CVD risk needs to be a priority for child health if the recent improvements in adult CVD morbidity and mortality are to be maintained. Children from non-white European backgrounds are at increased CVD risk – especially those of south Asian origin, who also make up the majority of children in the UK with type 2 diabetes. This increased risk is likely to be multifactorial, with both genetic and lifestyle factors playing important roles.

The CHASE (Child Heart and Health Study in England) Study has examined a range of risk factors for CVD in a large cohort of 9- to 10-year-old children attending primary schools in London, Birmingham or Leicester. The south Asian and black African-Caribbean populations living in these three cities account for more than two-thirds of the total south Asian and black African-Caribbean populations in the UK.

The CHASE Study Group have already reported data suggesting that non-white European children do less physical activity than their white European counterparts (Owen et al, 2009), and in this article the group report on the diet of this cohort (Donin et al, 2010; summarised alongside). More than 2000 children participated in this nutritional sub-study, of whom 558 were of south Asian origin, 560 were of black African-Caribbean origin and 543 were white European.

South Asian children were found to have higher total energy intakes, mainly due to increased fat (predominantly polyunsaturates) and protein intake, which could contribute to the increased incidence of overweight and obesity reported in this group (Office for National Statistics, 2004). There were also differences in micronutrient intake in this group, with lower levels of vitamins C and D and calcium being consumed than in the white European group, which could increase the risk of future CVD and type 2 diabetes (see, for example, Enstrom et al, 1992; Pittas et al, 2007; Harding et al, 2008). These differences were more marked in children of Bangladeshi origin.

Black African-Caribbean children tended to have lower energy intake from total and saturated fat, which could lead to the lower long-term risk of CVD that has been seen in the adult black African-Caribbean population (Wild et al, 2007). However, within this study the total and saturated fat intake was higher in children of black Caribbean, compared with black African, origin, suggesting that this sub-group may be drifting towards a more Westernised diet, with the associated long-term health implications. Ethnic differences were not affected by adjustment for socioeconomic status based on parental occupation or education.

The different diets of children from these ethnic groups could explain, in part, the variation in CVD risk seen in these populations as adults. The findings have implications for both clinical practice and public health. It is likely that lifestyle modifications aimed at children could be of long-term health benefit, however ethnically sensitive lifestyle modifications need to be developed and implemented collaboratively for successful outcomes.

Berenson G, Srinivasan S, Bao W et al (1998) Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults. *N Engl J Med* **338**: 1650–6

Ehtisham S, Hattersley AT, Dunger DB et al (2004) First UK survey of paediatric type 2 diabetes and MODY. *Arch Dis Child* **89**: 526–9

Enstrom JE, Kanim LE, Klein MA (1992) Vitamin C intake and mortality among a sample of the United States population. *Epidemiology* **3**: 194–202

Harding AH, Wareham NJ, Bingham SA et al (2008) Plasma vitamin C level, fruit and vegetable consumption, and the risk of new-onset type 2 diabetes mellitus: the European prospective investigation of cancer–Norfolk prospective study. *Arch Intern Med* **168**: 1493–9

Office for National Statistics (2004) *Health Survey for England 2004: The Health of Minority Ethnic Groups.* National Centre for Social Research, London

Owen CG, Nightingale CM, Rudnicka AR et al (2009) Ethnic and gender differences in physical activity levels among 9–10-year-old children of white European, south Asian and African–Caribbean origin: the Child Heart Health Study in England (CHASE Study). *Int J Epidemiol* **38**: 1082–93

Pittas AG, Lau J, Hu FB, Dawson-Hughes B (2007) The role of vitamin D and calcium in type 2 diabetes. A systematic review and meta-analysis. *J Clin Endocrinol Metab* **92**: 2017–29

Wild SH, Fischbacher C, Brock A et al (2007) Mortality from all causes and circulatory disease by country of birth in England and Wales 2001–2003. *J Public Health (Oxf)* **29**: 191–8

"An in utero hyperinsulinemic environment – irrespective of the degree of maternal gestational diabetes – was associated with increased risk of overweight and metabolic syndrome during early adolescence in offspring."

DIABETES CARE

Role for improved control using exenatide among adolescents with T1D

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 The drug exenatide, a glucagon-like peptide-1 receptor agonist, has been shown to improve postprandial glycaemic excursions in people with T2D.

2 In this study the benefit to a group of adolescents with T1D of exenatide therapy was investigated.

3 Eight participants completed a three-part, double-blinded randomised controlled study of pre-meal exenatide where two doses of exenatide (1.25 mg, 2.5 mg) were compared with insulin monotherapy.

4 Participants (aged 13–22 years) had a T1D duration of ≥1 year and were using multiple daily injections or insulin pump therapy at baseline.

5 Post-meal glycaemic excursions were significantly reduced over 300 minutes with both doses of exenatide versus insulin monotherapy ($P<0.0001$). Exenatide was also found to significantly delay gastric emptying ($P<0.004$).

6 Unlike previous T2D studies, glucagon suppression was not noted with exenatide use in the present study, however this could have been an artifact of the small sample size.

7 Postprandial hyperglycaemia in adolescents with T1D was reduced with the use of adjunctive exenatide therapy, a reduction that occurred despite reduction in insulin dose. The authors concluded that exenatide has therapeutic potential as adjunctive therapy in T1D.

Raman VS, Mason KJ, Rodriguez LM et al (2010) The role of adjunctive exenatide therapy in pediatric type 1 diabetes. *Diabetes Care* **33**: 1294–6

DIABETES CARE

Using an algorithm to guide CSII choices

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Sixty people with T1D treated with CSII were recruited to evaluate an algorithm that guides immediate responses to glucose levels and trends, as well as proactive changes to pump basal insulin settings.

2 One group was treated with a CSII/real-time continuous glucose monitoring (RT-CGM) with the algorithm (group A) initially, the other with CSII/RT-CGM but without the algorithm (group B) but given it later.

3 HbA_{1c} fell significantly in group A ($P<0.03$) but not group B. More people in group A achieved an HbA_{1c} ≤7% (≤53 mmol/mol) than in group B ($P=0.015$).

4 Early provision of this algorithm did not increase the time that glucose levels were in the target range but increased achievement of target HbA_{1c}.

Jenkins AJ, Krishnamurthy B, Best JD et al (2010) Evaluation of an algorithm to guide patients with type 1 diabetes treated with continuous subcutaneous insulin infusion on how to respond to real-time continuous glucose levels: a randomized controlled trial. *Diabetes Care* **33**: 1242–8

DIABETES CARE

Lower age at T1D onset increases retinopathy risk

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 The long-term risk of proliferative retinopathy (PR) relative to age at onset of T1D is not well known.

2 Consecutively recruited people ($n=1117$) from the FinnDiane Study population with T1D were followed, with the risk of PR studied in age-at-onset groups 0–4, 5–14, and 15–40 years. PR was graded based on ophthalmic records or fundus photographs.

3 Following analysis to exclude confounders, the highest risk of PR was observed in the age-at-onset 5–14 years group (hazard ratio, 1.90; 95% confidence interval, 1.45–2.48; $P<0.001$). Lowest PR risk was in the age-at-onset group 15–40 years.

4 Age at T1D onset was found to significantly modify the long-term risk of PR in this cohort, with the highest risk among those diagnosed between 5 and 14 years of age.

Hietala K, Harjutsalo V, Forsblom C et al (2010) Age at onset and the risk of proliferative retinopathy in type 1 diabetes. *Diabetes Care* **33**: 1315–9

DIABETES CARE

Overweight in adolescence associated with maternal GD

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 The cardiometabolic risk status of 129 adolescent offspring of Chinese women with a history of gestational diabetes (GD) was evaluated at 15 years of age. A control group was also established, consisting of offspring of mothers with normal glucose tolerance.

2 Adolescent offspring of women with GD had similar blood pressure, plasma lipid profile and rate of abnormal glucose tolerance as controls.

3 Independent of birth weight, maternal GD status, and mother's BMI, *in utero* hyperinsulinemia was found to be associated with a 17-fold increase in the metabolic syndrome and a 10-fold increase in overweight at adolescence.

4 An *in utero* hyperinsulinemic environment – irrespective of the degree of maternal GD – was associated with increased risk of overweight and metabolic syndrome during early adolescence in offspring.

Tam WH, Ma RC, Yang X et al (2010) Glucose intolerance and cardiometabolic risk in adolescents exposed to maternal gestational diabetes: a 15-year follow-up study. *Diabetes Care* **33**: 1382–4