

ALSPAC obesity interest group

A large number of investigators are working on the obesity resource. There is no formally constituted obesity group but various groups working on specific projects meet regularly.

The ALSPAC obesity resource

The ALSPAC obesity resource is set up to allow the study of the genetic determinants and the environmental antecedents and consequences of obesity in late childhood. In addition to data already collected in pregnancy and earlier in childhood we are collecting (and calibrating) detailed data on diet, physical activity and body composition through adolescence. We are using diet diaries completed over three days, physical activity diaries completed over four days and uni-axial movement sensors worn for seven days and whole body DXA scans.

A more detailed description of the resource is provided in:

Ness AR. The Avon Longitudinal Study of Parents and Children (ALSPAC) – a resource for the study of environmental determinants of childhood obesity. *European Journal of Endocrinology* 2004 Nov; **151**: supp.3 U141-U149.

Investigators working on obesity in ALSPAC

A list of investigators leading work in various areas is provided below (in alphabetical order):

Investigator	Area
Charlotte Atkinson	Physical activity
Steve Blair	Physical activity and sedentary behaviour
David Dunger	Early growth and genetics
Pauline Emmett	Diet
Ken Fox	Visceral adiposity (measured by MRI scan)
Susan Jebb	Diet
Laura Johnson	Diet
Debbie Lawlor	Early life
Richard Martin	Breast feeding
Andy Ness	Early life and physical activity
Ken Ong	Early growth and genetics
Russ Pate	Physical activity and sedentary behaviour
John Reilly	Early life and energy balance
Chris Riddoch	Physical activity
Jonathan Wells	Early life and determinants of lean tissue
Charlotte Wright	Early life and use of impedance measures

Recent papers (2005 onwards)

1. McCarthy HD, Jarrett KV, Emmett PM, Rogers I, ALSPAC Study Team. Trends in waist circumferences in young British children: a comparative study. *International Journal of Obesity* 2005; **29**:157-162.
2. Reilly J, Armstrong J, Dorosty A, Emmett P, Ness A, Rogers I, Steer C, Sherriff A. Early risk factors for obesity in childhood: cohort study. *British Medical Journal* 2005 Jun; **330**:1357.
3. Ong KK, Emmett PM, Noble S, Ness A, Dunger DB, ALSPAC Study Team. Dietary energy intake at the age of 4 months predicts postnatal weight gain and childhood body mass index. *Pediatrics*. 2006 Mar;**117**(3):e503-8.
4. Ness AR, Leary S, Reilly J, Wells J, Tobias J, Clark E, Davey Smith G, The ALSPAC Study Team. The social patterning of fat and lean mass in a contemporary cohort of children. *International Journal of Pediatric Obesity*. 2006; **1**: 59-61.
5. Clark EM , Ness AR, Tobias JH , ALSPAC Study Team. Adipose tissue stimulates bone growth in prepubertal children. *Journal of Clinical Endocrinology and Metabolism* 2006; **91**:2534-2541.
6. Griffiths LJ, Wolke D, Page AS, Horwood JP, ALSPAC Study Team. Obesity and bullying: different effects for boys and girls. *Archives of Disease in Childhood* 2006; **91**:121-125.
7. Rogers IS, Ness AR, Steer CD, Wells JC, Emmett PM, Reilly JR, Tobias J, Davey Smith G. Association of size at birth and dual-energy X-ray absorptiometry measures of lean and fat mass at 9 to 10 y of age. *American Journal of Clinical Nutrition* 2006; **84**:739-747.
8. Heude B, Petry CJ, ALSPAC Study Team, Pembrey M, Dunger DB, Ong KK. The insulin gene variable number of tandem repeat: associations and interactions with childhood body fat mass and insulin secretion in normal children. *Journal of Clinical Endocrinology and Metabolism* 2006; **91**:2770-2775.
9. Leary SD, Davey Smith G, Rogers IS, Reilly JJ, Wells JCK, Ness A. Smoking during pregnancy and offspring fat and lean mass in childhood. *Obesity* 2006; **14**: 2284-2293.
10. Brion MA, Ness AR, Davey Smith G, Leary SD. Association between body composition and blood pressure in a contemporary cohort of 9-year-old children. *Journal of Human Hypertension* 2007; **21**: 283-290.
11. Davey Smith G, Steer C, Leary S, Ness A. Is there an intrauterine influence on obesity? Evidence from parent-child associations in the Avon Longitudinal Study of Parents and Children. *Archives of Disease in Childhood* 2007; **92**: 876-880.

12. Dunger DB, Salgin B, Ong KK. Session 7: Early nutrition and later health early developmental pathways of obesity and diabetes risk. *Proceedings of the Nutrition Society* 2007; **66**:451-457.
13. Frayling TM, Timpson NJ, Weedon MN, Zeggini E, Freathy RM, Lindgren CM, et al. A common variant in the FTO gene is associated with body mass index and predisposes to childhood and adult obesity. *Science* 2007; **316**: 889-894.
14. Johnson L, Mander AP, Jones LR, Emmett PM, Jebb SA. Is sugar-sweetened beverage consumption associated with increased fatness in children? *Nutrition* 2007; **23**: 557-563.
15. Micali N, Treasure J, Simonoff E. Eating disorders symptoms in pregnancy: a longitudinal study of women with recent and past eating disorders and obesity. *Journal of Psychosomatic Research* 2007; **63**:297-303.
16. Ness AR, Leary SD, Mattocks C, Blair SN, Reilly JJ, Wells J, Ingle S, Tilling K, Davey Smith G, Riddoch C. Objectively measured physical activity and fat mass in a large cohort of children. *PLoS Medicine* 2007; **4(3)**: 0476-0484.
17. Reilly JJ, Andrew R, Ness A, Sherriff A. Epidemiological and Physiological approaches to understanding the Etiology of paediatric Obesity: Finding the Needle in the Haystack. *Pediatric Research* 2007; **61**: 646-652.
18. Toschke AM, Martin RM, von Kries R, Wells J, Davey Smith G, Ness AR. Infant feeding method and obesity: body mass index and dual-energy x-ray absorptiometry measurements at 9-10 y of age from the Avon Longitudinal Study of Parents and Children (ALSPAC) *American Journal of Clinical Nutrition* 2007; **85**: 1578-1585.
19. Goodfellow SA, Nothstone K. Childhood overweight and obesity in the UK - a comparison of two environmentally distinct populations of 7-year-old children. *International Journal of Pediatric Obesity* 2007; Oct 24:1-3 (epub ahead of print).
20. Johnson L, Mander AP, Jones LR, Emmett PM, Jebb SA. A prospective analysis of dietary energy density at age 5 and 7 years and fatness at 9 years among UK children. *International Journal of Obesity* 2007; Oct 2 (epub ahead of print).
21. Wright C, Lakshman R, Emmett P Ong K. Implications of adopting the WHO 2006 Child Growth Standard in the UK: two prospective cohort studies. *Archives of Disease in Childhood* 2007; Oct 1 (epub ahead of print).
22. Benfield LL, Fox KR, Peters DM, Blake H, Rogers I, Grant C, Ness A. Magnetic resonance imaging of abdominal adiposity in a large cohort of British children. *International Journal of Obesity* 2008; **32**:91-9.
23. Wright CM, Sherriff A, Ward SC, McColl JH, Reilly JJ, Ness AR. Development of bioelectrical impedance-derived indices of fat and fat-free mass for assessment of nutritional status in childhood. *European Journal of Clinical Nutrition* 2008; **62**: 210 –7.

24. Lawlor DA, Timpson NJ, Harbord RM, Leary S, Ness A, McCarthy MI, Frayling TM, Hattersley AT, Davey Smith G. Exploring the Developmental Overnutrition Hypothesis Using Parental-Offspring Associations and FTO as an Instrumental Variable. *PLoS Medicine* 2008 Mar 11;5(3):e33.

Forthcoming publications

Loos RJF et al Association studies involving over 85,000 samples demonstrate that common variants near to MC4R influence fat mass, weight and risk of obesity. *Nature Genetics*: (in press February 08).

Current grants (supporting work on obesity)

1. Ness AR. Lifecourse nutritional determinants of obesity and blood pressure in young adults. Work package in EARNEST: EARly Nutrition programming – long-term follow-up of Efficacy & Safety Trials and integrated epidemiological, genetic, animal, consumer and economic research. EU Framework 6 integrated project contract number 007036. 405,959 Euros for work package over five years from April 2005.

2. Davey Smith G, Ness AR, Burton P, Day I, Emond A, Henderson J, Lewis G, Peters T, Shaw M, Tilling K. The Avon Longitudinal Study of Parents and Children: consolidation of a two-generation cell-line-backed resource, for the study of environmental and genetic determinants of health and development from before birth to late puberty. Wellcome Trust and Medical Research Council joint award. £8,942,104 over five years from January 2006.

3. Lawlor DA, Davey Smith G, Tilling K, Day INM, Frayling T, Sattar N, Ness A, Rogers I, Deanfield J, Catalano P, Dabelea D. Maternal overnutrition and offspring fat mass, metabolic and vascular function. United States National Institutes of Health (NIH): National Institute of Diabetes and Digestive and Kidney Diseases. US\$ 1,080,000 (~£620,000) over four years from February 2007.

4. Riddoch C, Ness A, Blair S, Cooper A, Davey Smith G, Leary S, Mattocks C, Pate R, Tilling K. Physical activity and childhood obesity. United States National Institutes of Health (NIH). US\$ 2,088,322 over four years from August 2007

5. Lawlor D, Sattar N, Deanfield J, Tilling K, Day I, Davey Smith G, Ness A. Obstetric, lifestyle and genetic determinants of atherosclerosis, fat mass, insulin, glucose and lipid levels in women in early middle-age. British Heart Foundation. £882,350 over three years from November 2007.

Future plans

In future analyses researchers working on obesity plan:

- To describe the longitudinal association between objectively measured physical activity (and sedentary behaviour) and obesity
- To explore the lifecourse determinants of obesity in late puberty
- To investigate the lifecourse determinants of visceral fat deposition
- To continue to look at the associations between diet and obesity

Andy Ness
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