Reviewer's report

Title: Impact of Adiposity on Cardiac Structure in Adult Life: the Childhood Determinants of Adult Health (CDAH) Study

Version: 1 Date: 11 February 2013

Reviewer: Elaine Rush

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Impact of adiposity on cardiac structure in adult life: the childhood determinants of adult health (CDAH) study

This paper explores the association among measures of adiposity (BMI, waist circumference, skin fold thickness determined fat mass and sum of skin fold thickness) and left ventricular mass measured in adulthood by two dimensional M mode echocardiography.

The design of this substudy which measures 180 children from a cohort of 8498 (<2%) has children aged 7 to 15 years and therefore 26 to 36 years as adults. There is huge variability within this sample.

I am not a statistician but have wrestled with the problem of measuring growth and change in children. A statistician with an understanding of the analytical and practical problems as the authors quote themselves is essential.


The paper needs severe editing and revision to remove contradictions, inconsistencies and to be more readable.

Major comments and compulsory revisions

1. The growth of children is difficult to monitor as change in physical parameters is rapid and not linear. The measurement of children in this study took place when they were between 7 and 15 years of age. This age span includes puberty. When modeling change in children, age should be a very accurately measured variable, yet it appears in Table 1 to be measured to the nearest year which completely negates the complexity of the subsequent modeling. A difference in 1cm of height makes a very large difference to subsequent conclusions and a child may change many cm within a year. Height is squared for both the LVM index and body mass index.

2. The use of indices as continuous variables rather than raw data should be considered carefully

Packard GC, Boardman TJ (1999). The use of percentages and size-specific indices to normalize physiological data for variation in body size: wasted time,
3. I cannot follow the argument presented – The overall conclusion is that adiposity and adiposity from childhood to adulthood appear to have a detrimental effect on cardiac structure (in adulthood) either expressed as LVM or LVMI. Childhood BMI is not standardized for age and gender i.e. a continuous variable as a z score?. Adult ventricular mass is reported in g and is divided by height in m2 as an index – this also is problematic.

4. Bigger people have bigger hearts and other organs. Athletes also have larger hearts. The more mass to circulate blood to the more work the heart does. Why is a larger heart deleterious?

5. The definition of overweight and obesity varies – initially for children the criteria of Cole are used and for adults in the statistics section it states that the highest quartile in males and females were defined as overweight/obese. The criteria for adults usually are BMI 25 and 30 kg/m2. In table 2 more than 50% are classified as overweight or obese – what criteria were used?

6. On 10 children were classified as overweight or obese out of 180. Yet in figures 1a to 1d there 10 children are shared between two categories overweight child and normal weight adult, and overweight child and over weight adult.

7. Figure 2 is similarly confusing – in statistical methods low fit category is #20% fitness (how as % fitness defined?) and fit was 20% in 20 to 100% separately my male and female. In figure 2 children are referred to unfit (rather than low fit) This needs clarification and justification.

8. Both Figures 1 and 2 need to be considered carefully for how they add to the flow of argument.

9. More justification of why an increased LVM is deleterious is required; is there a cut off? What are the deleterious effects the authors refer to? What is the range of “normal”? Blood pressure was controlled for so this is not the effect?

Minor essential points and revisions

1. Throughout the manuscript measures are stated without the unit of measurement.. e.g. LVM, LVMI

2. Page 7 what does the d stand for in the equation by Devereux?

3. Was the variable skinfold thickness reported in table 1 the sum of four skinfolds – this should be clarified.

4. Why was the fitness index calculated as Watts divided by lean mass? Presumably the lean mass was determined from the skinfold equations?

5. % Fat is stated on page 9 and in discussion referral is to fat mass – which variable was used and why?

6. Table 3 – was child age and adult age accounted for in the modeling and if so how? BMI trajectory in children is not linear – in fact BMI may fall with age up to
about 7 years and then rises in a sigmoid fashion with very rapid change in adiposity during puberty for girls.

7. No note is made if the women have had children or not. This does make a difference to BMI.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

'I declare that I have no competing interests'