Reviewer's report

Title: Association of sexual maturation with excess body weight and height in children and adolescents

Version: 3
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Reviewer: Jeanie Tryggestad

Reviewer's report:

Benedet et al report in their manuscript that early sexual maturation is associated with excess body weight in females and taller stature in children age 8-14. This is an area of research especially in males that is lacking. A very large cross-sectional sample was obtained and efforts were made to reduce bias are a major strength of the work, but several issues are also raised.

Major Compulsory Revisions:

1. The authors attempt to put forth that the early maturation drives the excess weight rather than the reverse, but no analysis was done to prove this point. Several other authors including Wang et al and Wagner et al in 2012 have shown association in increased weight and earlier onset of puberty. It is unclear with the presented tertiles if the children with early puberty weighed more than their peers to begin with. In order for this conclusion to stand, it needs to be clearly stated that the children with early maturation were not different in weight than those with later puberty at each age. I would like to see an analysis for the weight of the children who went through early or late puberty compared to their peers at the same age.

2. The authors also put forth that leptin is driving the change in height in the early puberty section. While this has been shown to drive early puberty, it is less likely to be the direct link to increased height as other factors may be. It is well proven that early puberty will result in early epiphyseal fusion due to estrogen or testosterone aromatized to estrogen. It has also been shown that increased adiposity is also associated with aromatized estrogens. Another well documented factor is that IGF1 is increased in obese populations. These factors are much more convincing effectors of increased height than leptin.

3. On page 5, a description of how tertiles were established. This is very confusing and unclear. If the groups were divided in 3, it is impossible for someone to be below the tertile or in-between tertiles.

Minor Essential Revisions

1. In the abstract, the section labeled background is really an objective. No true background is given in the abstract.

2. In the methods section on page 4, it is unclear why 2 stages of selection for the schools was necessary. This section could be condensed and clarified.
3. Also on this page LMS needs to be defined with its first use.

4. The Tanner staging in this manuscript is by self report. While they have sited studies that validated this method in an adolescent population, the population is younger. Validation in this age group would strengthen the enthusiasm for this study.

Other revisions
1. On page 3, first paragraph of the background, last sentence may read more clearly as ...despite a modest or no increase...

2. On the same page in methods, it may read better as April 2007 and October 2007.

3. The city statistics are not necessary.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests