Reviewer's report

Title: The Prevalence, Risk Factors, and Screening Measure for Prediabetes and Diabetes among Emirati Overweight/Obese Children and Adolescents

Version: 2 Date: 16 August 2015

Reviewer: Maria Fiatarone Singh

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Essential Revisions

Abstract

1. “HbA1c seemed to substantially overestimate prediabetes (21.9%) but not diabetes.” It is possible that OGTT underestimates pre-diabetes as well, as there is substantial day-to-day variability in OGTT results.

2. “glycemic status were” should be “was”

3. “…parents being unemployed and with high triglyceride levels are at higher risk for developing T2D.” This is a cross-sectional study, and causality cannot be inferred from associations observed, reverse causality is also a possibility for these relationships, or linkage to a common underlying mechanistic factor.

Methods

1. “Further, exercise habits using physical activity score based on different levels of physical leisure activity [no activity, activity (1 time/week), regular activity (1-2 times/week), regular activity (3-5 times/week), and regular daily activity were recorded [17].” If this questionnaire has been validated in children of this age, please cite this reference and confirm validity.

2. “BMI percentiles according to percentile charts for age and sex from the Centers for Disease Control and Prevention (CDC), subsequently, children's weights were classified as underweight: BMI < 5th% ile, normal weight: BMI # 5th to <85th% ile, overweight: BMI # 85th to < 95th% ile, and obese: BMI # 95th% ile”. Please comment on the validity of these CDC percentiles based on Caucasian children from USA to the cohort under evaluation.

3. Statistical analysis. Prior to use of parametric statistics described, all continuous variables should have been inspected visually and statistically for normality of distribution, and need for transformation or use of non-parametric descriptive and analytical statistical methods determined.

4. What is the definition of consanguinity for the purpose of this investigation?

4. Was there any instruction given for CHO consumption of a minimum amount in the 3 days prior to the OGTT? Were there any instructions given regarding exercise on the day prior to or morning of the OGTT or the fasting glucose tests? How was 10 hr fasting confirmed?
5. How similar was the HbA1c measured on capillary blood vs. venous sampling?

6. Why was it decided up front that OGTT was the gold standard, and therefore used to compare to risk factors rather than comparing both HbA1c and OGTT definitions of pre-diabetes/diabetes to see which definition was most closely related to known risk factors (convergent validity).

Results

1. Figure 1 is missing from my copy of the paper, so I cannot tell if this information is presented there. “From the school health records, we identified 1436 Emirati students aged 11-17 years who were either overweight or obese according to our inclusion/ exclusions criteria”. What was the overall cohort from which these 1436 students were identified. How accurate was the height and weight in the school records compared to that measured in this study? If not accurate, is it possible that additional overweight/obese children were not identified for this reason?

2. Were students/parents asked why they did not want to participate? Were the 28% who did not participate different in terms of age, gender, or BMI compared to those who consented? This is important for determination of the external validity of the sample recruited and should be presented in results and discussion.

3. Is the high rate of consanguinity unusual for this cultural setting?

4. “However, given the small sample size, we could not compare the two methods for sensitivity and specificity”. There were sufficient cases of pre-diabetes to compare the two methodologies; in fact this is the stated purpose of this investigation. This should be done.

5. “relative with diabetic” should be “relative with diabetes in text and table.

6. Table 4 shows that parental employment was related to 79% higher prevalence of diabetes but introduction states that increased affluence in the region has been linked to the diabetes epidemic. This discrepancy needs to be discussed in the discussion section. However, it is not really clear whether the authors mean that “employment” or “unemployment” is the risk factor from the way that it is written.

7. 21% of students with abnormal capillary results on 2 occasions did not show up for venous blood sampling in the hospital. How did these students differ from the full sample. This loss needs to be commented on in terms of generalizability, as now there is a loss of 28% of overweight/obese who did not consent , in addition to 21% of those 72% who consented and were subsequently found to be hyperglycemic.

Discussion

1. The conclusion that HbA1c “overdiagnosed” pre-diabetes appears to be not completely justified. Another much larger study in Saudi Arabia indicated tha based on a review of HbA1C, FPG and OGTT:

“ Within our population, we would have missed the diagnosis of pre-diabetes in
469 (25.8%) patients if we had relied only on 2-h OGTT rather than A1c.”

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

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

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

**Declaration of competing interests:**
I declare that I have no competing interests