Author's response to reviews

Title: Spousal diabetes as a diabetes risk factor: A systematic review and meta-analysis

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Version: 4
Date: 2 December 2013

Author's response to reviews: see over
December 2, 2013

Lin Lee, PhD
Senior Editor
BMC Medicine

Dear Lin,

Many thanks for the opportunity for further revisions. We are very happy that Reviewer 2 is satisfied with the modifications made. We have further addressed the remaining comments that Reviewer 1 has suggested and believe that the manuscript is now even stronger. Please see our detailed responses below. We have also highlighted the additions and clarifications in the revised manuscript.

Looking forward to hearing from you,
Kaberi

Kaberi Dasgupta,
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Reviewer's report
Title: Spousal diabetes as a diabetes risk factor: A systematic review and meta-analysis

Version: 3

Date: 11 November 2013

Reviewer: Solveig Cunningham
Reviewer's report:

The authors have been responsive to reviewer comments. My notes below pertain primarily to enhancing the discussion section.

1. There are several reasons why spouses may be similar, and the authors note this in one sentence. I don’t think this is sufficient, since it’s an important issue. It could be that people with similar risks (for example in terms of BMI at marriage) get together, or that people with similar lifestyles get together; in that case, they may have followed the same trajectories even if they had not been together, or they may enable in each other’s unhealthy habits and exacerbate diabetes risks. Another scenario is that there is no assortative mating with respect to diabetes risk, but that one spouse’s behaviors affect the other’s lifestyles and risks. Most studies in your review may not have distinguished the mechanisms for similarity, but from the perspective of recommendations or interventions, it is important what the mechanisms are. Based on what you can garner from your review, can you provide more interpretation or guidance on these points in the discussion? For example, I mentioned duration of marriage as a possible way to disentangle some of these mechanisms, and I note from your table that most studies did not measure this.

We agree that there are several reasons why spouses may be similar and that this issue deserves more emphasis in our manuscript. We are delighted to elaborate on this topic as it indeed could affect the nature of interventions and strategies. Please see our revised Discussion, under Strengths and Limitations, Paragraph 4 and Paragraph 5 (new paragraphs):

Spousal history appears to be a robust signal for diabetes risk that may facilitate diabetes detection. Better understanding of underlying mechanisms of concordance could allow the development of tailored strategies to leverage shared risk to achieve health behaviour change. Several studies have indicated spousal concordance with respect to BMI [58-63], consumption of fat and fibre [60] and physical activity [64, 65]. Shared behaviours and risk profiles may be present already at the time of marriage, through an assortative mating process wherein individuals with similar physical (e.g., body mass index), ethnocultural, social (e.g., social class), and behavioural (e.g., eating and physical activity behaviours) characteristics may be more likely to become partners. Additionally or alternatively, spouses may shape one another’s behaviours over time or be influenced by common external factors (e.g., life events, physical environment, social network), contributing to diabetes concordance. An examination of the effects of duration of marriage on spousal diabetes concordance could provide some insight in terms of the importance of changes in health behaviour that occur during marriage. However, there was little information on marriage duration in the studies examined. There is, however,
evidence for spousal correlations of weight change over time [65-67]. In an analysis of 32 years of follow-up data from the Framingham cohort, Christakis and Fowler demonstrated that development of obesity in a spouse increased one’s risk of obesity by 37%, comparable to the 40% risk increase from the development of obesity in a sibling [43].

Even more compelling are so-called “ripple effects” described by Gorin and colleagues where interventions delivered to one spouse are demonstrated to affect the other [68]. For example, in the Women’s Health Trial, the husbands of women in the low-fat dietary intervention arm reduced their fat intake and body weight to a greater extent than the husbands of women in the control arm [69]. In the National Institutes of Health-funded Look AHEAD trial that examined the effects of weight loss on vascular disease events in diabetes patients, approximately 25% of the spouses of participants in the intensive intervention arm lost 5% or more of baseline weight compared to less than 10% of spouses of participants in the control arm [68]. This body of evidence suggests that not only can spousal diabetes concordance be leveraged to increase detection of diabetes and related risk factors, but also that diabetes prevention strategies could capitalize on within-couple influences.

1.5 Along these lines, I appreciated that you added a paragraph on what a better study should look like, but I find the paragraph pretty cookie-cutter – the recommendation of a well-done longitudinal study is true for most research, agreed. But, thinking through some of my notes here, can you provide insights specific to this research question?

We have thought through alternative study designs as the Reviewer has encouraged us to do. In the text below, we discuss such possibilities as longitudinal studies combined with qualitative assessments, examination of historical cohorts (i.e., retrospective cohort design), and evaluations of spouses of participants following diabetes prevention trials. Please see our revised Discussion, under Strengths and Limitations, Paragraph 6 (new paragraph):

Three possible strategies to examine spousal diabetes concordance and its underlying mechanisms include a prospective cohort study with more detailed data collection complemented by qualitative assessment, analysis of historical cohort data, and analysis of diabetes prevention trial follow-up data. In a prospective cohort study (i.e., examination of group of married couples over time wherein half have type 2 diabetes in one partner at baseline), married couples could undergo systematic evaluation of health behaviours (e.g., dietary intake interviews, food frequency questionnaires, pedometer or accelerometer-based assessments of physical activity), anthropometric measures (weight, height, fat mass), sociodemographic profiles (ethnocultural background, immigration status, education, occupation, income), living arrangements, and glucose handling (oral glucose tolerance testing) for accurate classification of diabetes and prediabetes. Periodic reassessment would allow capture of incident prediabetes and diabetes to
determine the impact of factors such as marriage duration and degree and duration of shared health-related behaviours. Such a study would be strengthened by in-depth interviews or focus group discussions to ascertain participants’ perceptions of concordance and its underpinnings. One could also examine spousal diabetes concordance and its relationship to marriage duration using a historical cohort design, similar to that employed by Christakis and Fowler to assess obesity concordance with Framingham cohort data. Third, evaluations for ripple effects could be conducted among individuals and spouses involved in diabetes prevention trials, namely the Diabetes Prevention Program, the Finnish Diabetes Prevention Study, the India Diabetes Prevention program and a Japan lifestyle intervention program, wherein dietary and physical activity interventions lead to relative reductions of 28 to 67% in diabetes incidence over an average of 4 years [46, 48, 70, 71]; benefits of lifestyle intervention can persist beyond 10 years [72]. It is possible that spouses of those randomized to the lifestyle intervention arms in these trials experienced lower incidence rates of diabetes than spouses of control arm participants.

2. This analysis is not more comprehensive than Di Castelnuovo, just more specific with a focus on diabetes.

We agree that the major difference between our review and that by Di Castelnuovo is our more specific focus on diabetes. We have clarified this point in the discussion section of the revised manuscript (Discussion, Strengths and Limitations, Paragraph 1).

Compared to the meta-analysis by Di Castelnuovo and colleagues, our diabetes-related search string (Appendix 1) was more detailed, including “diabetes” and other diabetes-related search terms in addition to “glucose”, given our specific focus on spousal diabetes concordance.

3. Be clear what you mean by a cohort. I’m assuming a cohort is people who were married or entered a partnership around the same time? Please clarify. In the same paragraph, you mention recruiting “from similar geographic areas”. Please clarify why, as geographic variation was not an important factor among your findings.

By cohort we are referring to a group of married couples evaluated over a specified time period. Please see response to 1.5 above where in the modified text we have specified: In a prospective cohort study (i.e., examination of group of married couples over time wherein half have type 2 diabetes in one partner at baseline)...

While the degree of spousal concordance may be similar across different countries in our systematic review, these included studies tended to recruit participants from within well-
circumscribed geographic regions. This strategy likely reduces possible differences in the external environment among subjects that could potentially confound or distort associations.

4. I could not read Figure 2.

We have appended figure 2 to this letter in case there was difficulty downloading.

We thank the Reviewer very much for these comments.