Reviewer's report

Title: MTNR1B rs10830963 is associated with fasting plasma glucose, HbA1C and impaired beta-cell function in Chinese Hans from Shanghai

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Reviewer: Ehm Astrid A Andersson

Reviewer's report:

The authors investigate associations between MTNR1B rs10830963 and fasting plasma glucose (FPG), HOMA-indices T2D and sleep patterns/disorders in Chinese Hans from Beijing and Shanghai. The study confirms previous findings on FPG and HOMA-B in European and Asian populations in the Shanghai population, but describes differences in associations between the two geographical regions. Of novel interest, no associations with sleep patterns and disorders are observed.

Major revisions

1. In the background, the authors should explain in more detail that MTNR1B variants have been investigated in Asian populations before, including Chinese Hans. This should be clarified even in the abstract section.

2. Throughout the manuscript a meta-analysis with other studies is described (abstract results section line 4; main text result section line 21; discussion line 7). This meta-analysis is not found anywhere in the manuscript, making it difficult to interpret the results. However, the authors seem to perform a meta-analysis with only data from Prokopenko et al (ref 6) and Rönn et al (ref 9) and their own data (from Shanghai Hans) and conclude that no heterogeneity is observed.

Why were all other previously published studies and the Beijing Hans not included in this meta-analysis?

The authors state that the effect in Shanghai Hans is slightly higher than previously reported (0.11 vs 0.07), but was it significantly higher? It seems as if, it is not, which suggests that the effect is not different. This is a very simple test to perform.

The meta-analysis described does not add additional information and should not be used to state that effects are similar, when only a few studies are included. It should therefore not be included in the manuscript, unless all studies are included.

3. The power calculation for sleep disorders seems to be overestimated. Please re-calculate and report the effect that can be excluded with 80% power in the separate and/or in the combined study samples.

Minor revision
4. In the abstract background section, it is stated that “a variant in the gene regulates circadian rhythms,” this needs elaboration and a reference in the main text, otherwise it should be rewritten.

5. Effect sizes and 95% confidence intervals should be represented in the abstract for the positive associations.

6. Results line 5 and discussion line 4, all appropriate references should be added.

7. Why is data not shown when adjustments for sleep duration or disturbances are made? Although no associations change, these analyses are novel and could be presented. Interaction analyses with sleep (SNP x environment [sleep]) on FPG, homa-b etc. could also be of interest.

8. The lack of association in the Beijing population is speculated to be due to differential lifestyle. Did you try to adjust for the available lifestyle factors (drinking, smoking etc)?

9. Lack of statistical power should also be discussed as a potential explanation for the lack of association and power calculations for quantitative traits should be performed.

10. Table 2; to be consistent HOMA-S may as well be calculated using a random model.

11. Table 3 should be more consistent in the way results are presented. The odds ratio per allele should be presented when applying logistic regression together with a P-value for the additive model (diabetes and sleep disorders). Only for two traits the models used are described, please specify the models used for the remaining traits.

12. How were the associations analyses with siesta frequencies carried out? Please describe in the statistical methods section.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'