Peer Review Report

Review Report on Results of the Adult COVID-19 Lifestyle Matching Study

Reviewer: Michael Silverman

EVALUATION

Q 1 **Please summarize the main findings of the study.**

Several risk factors for COVID-19 were identified in a study comparing patients admitted to hospital in China with a clinical diagnosis of COVID were compared to surgical patients in the same hospital.

Q 2 **Please highlight the limitations and strengths.**

The lack of laboratory confirmation of the diagnosis was likely related to limited testing resources at the time of study. A design comparing test positive to test negative patients would have been more robust.

Q 3 **Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.**

Introduction: all lifestyle risk factors mentioned are for chronic diseases, not acute infections. References related to lifestyle and acute infection risk would be helpful, or at least chronic infection such as HIV, Hepatitis C

Ideally compare those who test + to those who test negative to have a more representative comparison group.

Where were the controls selected from? It appears that they were selected from surgical patients (not explicitly said). People having surgery will generally be younger and have less comorbidities than those admitted for medical problems.

More controls had lower education. This is likely associated with occupations that put them at risk of exposure. This also is associated with many health related activities. Apparently there was supposed to be matching based on education, but it doesn't seem to have been adequate. Ideally education would also be placed into the multivariate model

Not using a laboratory means to determine cases or controls (just physician diagnosis) means many confounders can be present. It is unclear if these are risks for "severe CoVID" which would come to medical attention, or risks for being exposed to CoVID or a combination.

Line 52 Chewing AC and other substances, especially hydrated lime, causes continuous local stimulation of oral epithelial cells, which can cause chronic
inflammation, oxidative stress, and cytokine production[20] .

In line 62 AC chewing again used

Needs correction- do not chew AC "alcohol consumption"

Line 138 "HP, Hypertension (HP)" do not need to repeat the acronym

Table 1 does "worker" mean manual labourer?

Is being a vegetarian harmful in this analysis? Bland diet also harmful? Are these associated with poverty and thus occupations that put people at risk

Were corrections for multiple comparisons made as many p values quoted in table 1

Discussion: "This study indicated that walking protects
against COVID-19." This is just a correlation. Causation cannot be inferred. Walking more may mean spending more time outdoors and away from crowded indoor spaces (less likely to be exposed). High intensity exercise was harmful and that may be because it was in a gym or competitive sports which leads to exposures. Being able to spend time walking may be a marker of fitness (not a cause) and thus less likely to be admitted for a medical illness.

Similarly a bland diet is discussed as potentially causative in increasing risk. The possibility that this is simply due to a bland diet being associated with a lack of education, or poverty and thus working in an environment where social distancing is not feasible is not addressed.

AC was not listed as a variable that was put into the multivariate analysis but is in the multivariate results. Is this correct?

Recommending Tea drinking based on this correlation is not warranted. Other confounders to tea drinkers having less CoVID may exist (as noted; it isn't clear that correction for alcohol use occurred and this may be inversely associated with tea drinking) and so an association study cannot recommend widespread public health interventions. Smoking was protective in this study, will the authors similarly recommend smoking?

Conclusion
"We investigated the effects of educational background, occupation, place of residence, marital status, sex, and age on the rate of incidence of COVID-19 and found that physical activities, especially regular walking, and drinking more tea were conducive to reducing the risk of COVID-19, whereas drinking any type of alcohol significantly increased the risk of COVID-19."

This conclusion is inaccurate. If the two groups were matched for all these demographics (as the methods suggest but do not clarify explicitly) then the impact of these demographic factors on risk cannot be compared in this study.

PLEASE COMMENT

Q 4   **Is the title appropriate, concise, attractive?**

Yes

Q 5   **Are the keywords appropriate?**

Yes

Q 6   **Is the English language of sufficient quality?**

Yes

Q 7   **Is the quality of the figures and tables satisfactory?**

Yes.

Q 8   **Does the reference list cover the relevant literature adequately and in an unbiased manner?)**

Needs references re lifestyle and acute infections not just lifestyle and chronic conditions. Covid is not a chronic condition.

QUALITY ASSESSMENT

Q 9   **Originality**

Q 10   **Rigor**

Q 11   **Significance to the field**

Q 12   **Interest to a general audience**

Q 13   **Quality of the writing**

Q 14   **Overall scientific quality of the study**

REVISION LEVEL

Q 15   **Please make a recommendation based on your comments:**

Major revisions.