Reviewer's report

Title: Mental health and cognitive associations with seropositivity among a cohort of people coming for testing for HIV/AIDS in Goa, India

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Reviewer: Greg Armstrong

Reviewer's report:

The paper is adequately written and covers an important topic of some interest on the biological pathways between HIV infection and common mental disorders and cognitive impairment. They have gathered an interesting sample of both seropositive and seronegative participants. The research focus and methods appeared to be appropriate. The authors were correct to state in the discussion that their findings were inconclusive, however it appears there were some other limitations to the study that should be considered for inclusion to the final manuscript.

Minor issues:
1) The paper would be improved by more detail about the place of recruitment. Were patients attending HIV testing as part of pre-marital testing, routine screening, a result of medical referral or some other reason? The prevalence of HIV in this sample is high and yet we don’t much about the reason for people attending for testing.
2) A capital 'N' is used in the headings of Table 1 and Table 2 instead of a lowercase 'n' which would be more appropriate given they are reporting the results from a sample.
3) In Table 1, sometimes the percentages are presented in parentheses and other times they are not.

Major issues:
1) Measurement error:
   a. It seems that there is possibly some measurement error in this study. The prevalence of HIV is 11.4%, a high prevalence that is equivalent to that found among high risk sub-populations in India such as people who inject drugs and those selling sex. Yet few participants are reporting that they have engaged in risk behavior: 0.1% reported injecting drugs, 0.8% of men reported having had sex with other men, 1.9% reported having received money or gifts in exchange for sex, 5.0% reported having sex with a sex worker, and just 12.6% reported having sex with someone other than a regular partner in the last 12 months. Is it possible that the contrast between the low level of risk taking and the high prevalence of HIV suggests that respondents were not giving accurate answers to questions regarding risk behavior?
   b. The PHQ and GAD picked up a low prevalence of symptoms of depression
and anxiety. The prevalence of depression or anxiety symptoms is 5.4%, and yet we aren’t given an adequate breakdown of the individual results of the two scales (i.e. what % screened positive for depression and what % screened positive for anxiety, and what % screened positive for both?).

c. Furthermore, the prevalence of CMD seems very low - might you say almost unusually low for a sample of people attending for HIV testing? Poongothai (et al 2009) used the PHQ among a systematic random sample of 26,001 residents of Chennai and found that 15.1% classified as having symptoms of depression. Salve (et al 2012) used the PHQ among a sample of 350 people attending a mobile health clinic in South Delhi and 26.3% screened positive for depression. The authors could 1) draw some comparison to these and other studies and 2) consider whether there were any measurement issues involved in their study that may have lowered the capacity of the PHQ and GAD questions to be answered accurately by respondents in a busy clinical setting (e.g. where all respondents interviewed in a private location?, how were the questions on depression and anxiety introduced to the participants by the interviewers?, etc).

2) The authors combined the responses to the GAD and PHQ to form one dichotomous variable called CMD; that is, the participants had symptoms of either depression and/or anxiety OR they had no symptoms of either. This variable is then used to test the hypothesis that common mental disorders would predict testing positive for HIV/AIDS. The authors acknowledge that the association might go the other way too, that CMDs might influence risky behavior and thus result in a greater likelihood of testing positive for HIV/AIDS? If so, the effects of depression and anxiety might each be different with regard to risk behavior. For example, someone with depression may be more likely to have poor condom use whilst someone with generalized anxiety disorder may be more likely to display risk avoidant behavior. The authors have not discussed whether the relationship between HIV positivity is the same for both depression and anxiety. They may be associated with HIV positivity in different ways.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests