Reviewer's report

Title: Ethnic differences in the association between blood pressure components and chronic kidney disease

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Reviewer: Gemma Browne

Reviewer's report:

Relevance
This is an interesting and relevant use of 3 separate but similar cross sectional studies including estimates of eGFR and Hypertension which has been measured in a standardised way across the 3 studies.

Study Title
Suggest revision Major Revision of Title
Title perhaps might be worthwhile including that these associations are in Middle aged and older adults from Singapore (as the study does not look at the entire population or multiple other ethnic groups) I also would include that it describes the description of Hypertension and CKD in the different ethnic groups as some of the interpretation of the Odds ratio derived Associations will need a note of the prevalence of CKD and HT in the different ethnic groups.

Study Design
The study design is cross sectional so it is difficult to tease out causality especially in the hypertensive effects of impaired renal function. The population selection is clearly described as random and the response rate is quite high and similar across the 3 studies

Methods of Measurement of Exposure
Hypertension data from all 3 ethnic groups seems to been measured in a very standardised way allowing comparison although the fact that they come from 3 separate studies occurring quite a few years apart may run the risk that there may have been some inherent differences in the method of measurement and the clinical environment, however the methods relating to the description of measurement appears very similar and comparable. Additional data relating to potential additional risk factors for CKD includes education, smoking, alcohol intake, lipid status and status of Diabetes and I think the inclusion of these variables adds strength to the paper.

Major Revision to add to Limitations in Discussion
As microalbuminuria is an important additional outcome measurement both in respect to estimates of CKD and potential consequences of hypertension and Diabetes, the absence of this measurement is a limitation of the study.
From a confounding variable perspective in Singapore, is there a difference in Socio economic status across the 3 ethnic groups that might also explain less well treated blood pressure and more obesity and hypertension, there is a profound difference in Malays in the proportion receiving anti hypertensive medication so we could assume perhaps that they also are less likely to receive ACEi or ARB, this lesser availability of antihypertensives consequent of whatever reason may explain the findings irrespective of the ethnicity.

Minor Revision
Appropriately education is measured and there is a very significant difference with lower levels of education among the Malays, it would be interesting if there were any other measure of SE status to compare this effect.

Methods of measurement of Outcome
All creatinine measurements are calibrated appropriately and the use of the CKD Epi formula in this population is also correct in the presence of a normal population, I would like to confirm that the earlier study 2004-2006 applied the same calibration standards as the later studies, as there is a temporal difference across the 3 studies. From a population perspective, it is a slightly older group with the mean age marginally different across the 3 groups although most in later middle age,

Major Revision how Odds Ratios across the different ethnic groups are demonstrated and explained
To assist the reader in understanding any potential explanations for differences in the odds ratios across the ethnic groups a figure showing the difference in distribution of the blood pressures across the 3 ethnic groups might be a helpful summary of the data, with this additional figure the question as whether the average blood pressures are different in the 3 groups. I note that when looking at the quartiles of systolic and diastolic BPs, the selected study related quartiles measured seem to higher in one ethnic minority over the other 2, this results in some difficulty in comparing the resulting odds ratios across the 3 groups and perhaps the highest quartile needs to be set at a higher blood pressure level across all three groups to allow the same description of blood pressure.

Regarding the reporting of results, do the odds ratios mean the same thing if the Hypertension is much higher and more prevalent in one group than the other 2. You could consider using a fractional polynomials spline curve to allow a demonstration of the rate of change of OR using separate curves for different ethnic groups. It is important to discuss in the discussion how the baseline parameters of Blood pressure and education differ particularly in one ethnic group and this will influence the associations with CKD

Minor Revision Change
See Discussion Paragraph 4
While few cross sectional studies conducted among Chinese,20 and Japanese21;41 adults have reported no significant association between systolic
BP and CKD, few studies have shown a strong association between systolic BP and ESRD.19;38

This sentence may need to be revised as it sounds a little contradictory and it is not clear what the message of the sentence is, ie avoid double negatives,

Several cross sectional studies among Chinese and Japanese adults have shown significant association between BP and CKD, however few have shown a strong association between systolic BP and ESRD or does it mean Few cross sectional studies among Chinese and Japanese adults have shown significant association between systolic BP and CKD or ESKD

As large sample size beware of just calling odds ratio statistically but need to look at strength of association depends on Ethnic group

As using three different tables, there may need to be an additional figure to summarise the important odds ratios including the 3 ethnic group including the full multivariate models 1 and 2.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests