Author's response to reviews

Title: The relationship between mean arterial pressure and decreased glomerular filtration rate

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Version: 2 Date: 5 April 2015

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The Biomed Central Editorial Team

Object: MS: 8437610381533490-The relationship between mean arterial pressure and decreased glomerular filtration rate. Yang Hongmei et al.

Thank you for consideration of our manuscript for publication in your journal. We have reviewed the above manuscript according to your reviewer’s comments.

Reviewer # 1 (Donald S Silverberg)

Minor comments:
1. Line 35: were older not with higher age
   It has been changed as the reviewer indicates.
2. Line 62: obtained inconsistent results; How the blood pressure affects
   It has been changed as the reviewer indicates.
3. Line 65 is not a sentence
   The sentence has been changed with “it is unknown how MAP influences the glomerular filtration rate (GFR)”.
4. Line 89 baseline data
   It has been changed as the reviewer indicates.
5. Line 98 carried out
   It has been changed as the reviewer indicates.
6. Is there no data about smoking and when they smoked their last cigarette?
   Smoking status appears in the figures but is not mentioned in the description or the results
   In definitions, we have added “Drinking and smoking status were divided into current drinkers/smokers and nondrinkers/smokers”, and these definitions refer to some literatures such as “Association of smoking and khat (Catha edulis Forsk) use with high blood pressure among adults in Addis Ababa, Ethiopia, 2006”.
   In results, we have changed as the reviewer indicates. “Men with decreased eGFR (eGFR < 60 ml/min per 1.73 m2) had higher age, mean WC, systolic and diastolic BP, PP, MAP, total fasting glucose, LDL-C, glyceride and uric acid levels and were current drinker / smoker at the baseline (all P < 0.05). Those with low education level, low income, low physical activity, low hemoglobin and HDL-C level had decreased eGFR (all P < 0.05). In women, the results were similar to those of men, but DBP and drinking status had no association with the eGFR in women.”
7. Line 198 figure 2 shows that
   It has been changed as the reviewer indicates
8. Line 208 is not linear
   It has been changed as the reviewer indicates.
Reviewer # 2 (Roberto Minutolo)
Majors Compulsory revisions

1. Authors stated that “how does the blood pressure affect kidney function and the gender differences remains unclear”. Actually, a lot of studies have evaluated the relationship between BP and renal function, not only in terms of association but also in terms of causality (high BP induces renal damage).

   We are grateful for the relevant suggestions and it is true that a lot of studies have evaluated the relationship between BP and renal function. But the influence of components of BP on renal function is controversial. MAP, as the organ perfusion pressure, not only affects the kidney perfusion but also effects electrolyte secretion. MAP increased or decreased have adverse effects on renal function, so to find a suitable MAP to maintain the normal function of the kidney is important. It is inaccurate that we stated that “how does the blood pressure affect kidney function and the gender differences remains unclear”. We revised “How MAP affects kidney function and gender differences in this mechanism remains unclear.

2. The importance of MAP is an old pathophysiologic concept now replaced in clinical studies by systolic BP whose prognostic meaning is much higher than diastolic as well as MAP. Since MAP, one can argue that replacing MAP with systolic or diastolic BP you may find a significant association with the systolic component.

   The longer history of hypertension, the pathological and physiological change of kidneys are more obviously. In addition, since the majority of CKD patients with a history of hypertension, the high base in the arterial blood pressure, renal blood flow autoregulation scope is narrow, and history of hypertension for longer periods of time, can automatically adjust range is narrow, the automatic adjustment mechanism of renal tissue partial or complete loss of renal blood flow and renal blood flow in the ischemic areas almost entirely dependent on arterial blood pressure to maintain renal perfusion. The GFR decreased because renal perfusion pressure is too high or too low. However, the decisive factors of renal perfusion pressure is not a simple systolic or diastolic blood pressure, but the mean arterial pressure, so we chose the mean arterial pressure as an object.

3. The association between BP and lower GFR is highly expected since hypertension (present in more than 90% of CKD patients) is a maladaptive response aimed at maintaining external sodium balance.

   We agree with the views of the reviewer, renal sympathetic nerve activity represent an important physiological contribution to the overall role of the kidney in the regulation of external sodium balance and the defense against sodium deficit and surfeit. Abnormalities of this mechanism can lead to inappropriate renal sodium retention and augmentation of renin secretion, two factors which are capable of contributing to the development and maintenance of hypertension.

   **Level of interest:** An article of insufficient interest to warrant publication in a
Although the mean arterial pressure is not a new concept, but it is closely related with fluctuation of blood pressure. The application of 24 hour ambulatory blood pressure is limited, especially in the rural areas, MAP can be used as an alternative indicator to evaluate the perfusion of kidney, and we also verify the existence of gender differences in relationship between blood pressure and the renal function, so we think that our paper is meaningful.

Quality of written English: Needs some language corrections before being Published

We have got language corrections as the reviewer indicates.

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