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Take-home message: Comorbid hypertension correlates with poorer outcomes in patients with Covid-19.

To the editors

We truly appreciate the comments from Sisnieguez et al., who have performed a further analysis on the potential association between cardiovascular comorbidities and the clinical outcomes of Covid-19 (in particular, the mortality) [1]. We also applaud the suggestion to thoroughly adjust for the potential confounding factors when interpreting the association between specific categories of cardiovascular comorbidities (e.g., hypertension) and the clinical outcomes of Covid-19. To this end, we have attempted to incorporate the cardiovascular diseases (including coronary heart disease) into the multivariate regression model [2]. Findings of the model indicated a prominent collinearity between hypertension and coronary heart disease, and we have therefore elected to retain hypertension in the regression model for further analyses.

Like other comorbidities such as chronic obstructive pulmonary disease, the record of cardiovascular comorbidities was derived from the patient’s self-report, which could not preclude under-reporting. Therefore, the percentage of patients with cardiovascular diseases might have been underestimated given the urgency of data collection (history taking) within the wards during the outbreak. Our findings could have also been attributed to the relatively low proportion of patients with co-existing hypertension and coronary heart disease in our study. Nonetheless, the overall proportion of patients with comorbidities in our study [2] was
in keeping with the previous publications [3-7]. Our findings were likely to be generalizable to other population worldwide.

The causes for the association between cardiovascular diseases and the poor clinical outcomes of Covid-19 might be multifaceted, including but not limited to the interaction with the age, and the cardiac dysfunction due to viral infections. Since our study was a cross-sectional case study, causality could not be inferred from the current study design. Dynamic monitoring of the cardiovascular symptoms, the cardiac function, and the laboratory markers might help unravel the underlying pathways linking cardiovascular diseases to the poor clinical outcomes of Covid-19.

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