Reviewer's report

Title: Association of hypertension with physical factors of wrist pulse waves using a computational approach: a pilot study

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Reviewer: Hyunho Kim

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A clinical trial about wrist pulse measurement was conducted to explore the association of hypertension with pulse factors. Pulse wave detector device developed by Korea Institute of Oriental Medicine (KIOM) was used for measurement. For statistical calculation, logistic regression, Bayes algorithm, wrapper, and AUROC were used. Five-fold cross validation was conducted for calculating predictive powers.

Hypertension is a very popular disease and a very important medical risk factor to the various diseases including CVA, and so evaluating and managing blood pressure are essential to the whole ages. Despite of the many useful and convenient methods to measure BP, wrist pulse measurement has also clinical values of importance in TKM or TCM point of view.

In spite of important subject, well-designed trial, and interesting approach like ML, there are some issues to discuss and revise.

Major Compulsory Revisions

1. In result, authors suggest useful predictors of hypertension based on the high association like p-value under 0.05. But it is known that p-value is influenced by sample size very well, so, AUC should be the standard of judgment if authors discuss predictions. In general, AUC greater than 0.7 means fair predictability. So, I think only L-PPI and R-PPI can be suggested as good predictors.

2. I think Table 4 has some mistakes or ambiguity. I recommend specificity rather than 1-specificity. Moreover, in general, sensitivity and specificity have strict definition about disease and non-disease, so sensitivity and specificity should be expressed in the assumption that hypertension is a disease to predict. If so, 2nd, 4th, 6th, 8th lines will be deleted. Likewise, the sentence “The sensitivity and 1-specificity values were much higher for… in our study” delivers ambiguous meanings.

3. In clinical view, the most important investigation of this study is the difference between left and right physical factors. There must be discussion about that. If there is no proper evidence or previous study to refer, authors can say so, at least.

Minor Essential Revisions

1. Detail descriptions of parameters are necessary (e.g. L-Sum-30p,
L-Asys-HR75, L-PSD-w1, etc)
2. The last paragraphs of introduction and result are thought to be more suitable in the discussion.
3. Multicollinearity should be checked after LR or NB feature selections. Probably some variables could be associated with one another.

Discretionary Revisions
1. A graphical example of AUROC in NB or LR may be very helpful to understand, if possible.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**
I declare that I have no competing interests.