**Response to Reviewers**

To all reviewers, thank you for your review and comments. The manuscript was revised in consideration of reviewer’s comments, and summarized as follows.

**Reviewer #1**

**As clinical hypertension is official journal of Korean society of hypertension, it would be better to decribe the relationship betweeen hypertension and pulsatile index of MCA or BA in decussion.**

Thank you for the insightful comment. It has been demonstrated that the pulsatility index of the middle cerebral artery increased in patients with hypertension. Additionally, the presence of hypertension has been reported to be associated with an increase in the basilar artery pulsatility index. So, we inserted the sentence in page 9, line 162–163:

Additionally, It has been demonstrated that the MCA PI and BA PI increase in patients with hypertension [27,28]

**If there are any other studies that comparing pulsatile index of MCA and BA, it would be better to describe in this article. So that BA PI was selected not only it is easy to measure, but also it can relflect PI of MCA.**

Thank you for your comments. Previous study showed that PI of MCA and BA well correlated each other among the lacunar stroke patients with diabetes mellitus.

We inserted the sentence in page 9, line 174–page 10, line 175:

Previous study showed that BA PI is well correlated with MCA PI among the lacunar stroke patients with diabetes mellitus [31].

**Reviewer #2**

**#. In Table 1, the Rt. MCA PI had significantly different level among 4 group, but the p-value of Lt. MCA PI was 0.822. Is there any reason for this?**

Thank you for the insightful comment. We reviewed previous data analysis result and found that some cases were missing and analyzed again. We revised the manuscript that there was a statistically significant difference between right (*p*-value<0.001) and left (*p*-value<0.001) middle cerebral arteries among 4 groups.

**#. In Table 1 and 2, the variable 'smoking' means 'current smoking'? If so, it is recommended to describe it as current smoking.**

Thank you for the thoughtful comment. That means current smoking, so we modified that.

**#. Is there any possible mechanism about the association between BA PI and neurologic deterioration? The author should describe about this in the discussion section.**

Thank you for the insightful comment. We suspect that elevated PI reflects intracranial arterial stiffness which deteriorate small arteriolar perfusion defect among stroke patients, thereby causing neurological deterioration among at-risk patients. We inserted these sentences in page 9, line 166–170:

Early neurological deterioration with ischemia progression can occur due to decreased cerebral blood flow from parent artery or lack of collateral circulation. Previous study showed that higher pulsatility of MCA was associated with progression in lacunar infarction [29]. Since PI measured by transcranial Doppler sonography might reflect downstream arterial resistance and vascular perfusion status, elevated PI could be a possible indicator of stroke progression [29].

**#. In Table 1, what means ‘ progression’?**

Thank you for the thoughtful comment.

Progression also stands for the neurological deterioration. We changed ‘progression’ to ‘neurological deterioration’ for the clarity and consistency of the manuscript.

**#. The author showed multi-variable logistic regression analysis adjustments for significant factors with a p value of ≤0.10 in uni-variate analysis. It is recommended to describe it in Statistical analysis of Method section.**

Thank you for your thoughtful comments.

We inserted the sentence in page 7, line 125–126:

Multivariable logistic regression analysis included the factors with p value less than 0.10 from bivariable analysis.

**References**

27. Cho SJ, Sohn YH, Kim GW, et al. Blood flow velocity changes in the middle cerebral artery as an index of the chronicity of hypertension. J Neurol Sci. 1997; 150(1):77-80.

28. Jeong HT, Kim DS, Kang KW, et al. Factors Affecting Basilar Artery Pulsatility Index on Transcranial Doppler. Korean J Clin Lab Sci. 2018; 50(4):477-83.

29. Lee KJ, Jung KH, Park CY, et al. Increased arterial pulsatility and progression of single subcortical infarction. Eur Radiol. 2017; 27(3):899-906.

31. Lee K-O, Park J-H, Choi Y-C, et al. Increased pulsatility index in acute lacunar infarction with type II diabetes. J Korean Neurol Assoc. 2005:457-62.