Is the relation between three comorbidities and carotid atherosclerosis dependent on the sum or not?

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DEAR EDITOR,

We have much interest in reading the article entitled "Combined effects of hypertension, hyperlipidemia, and diabetes mellitus on the presence and severity of carotid atherosclerosis in community-dwelling elders: A community-based study" published in the February issue of the *Journal of the Chinese Medical Association*.[1] The authors found that the number of the comorbidities (hypertension, diabetes mellitus [DM], and hyperlipidemia) was one of the most predictive factors of presence (odds ratio [OR] 1.52, 95% confidence interval [CI] 1.28-1.81) and severity (OR 1.57, 95% CI 1.28-1.93) of carotid atherosclerosis in their model 1, but in the model 2, the number of the comorbidities seemed to fail to play any predictive value about either presence or severity of carotid atherosclerosis.[1] However, the authors concluded that "the number of common cardiovascular disease (CVD) comorbidities was the most predictive determinant of carotid plaques and advanced carotid atherosclerosis."[1] At first, we congratulated the authors' contribution to enhance the global health in Taiwan. To clarify the role of CVD comorbidities on carotid atherosclerosis, we would like to ask for the authors' response to our concerns since some uncertainties are noted.

First, only one model supported their conclusion, but the other model showed conflicted data. If this parameter is so important, we are wondering to know why the importance of this parameter will disappear in the other model. At least three critical factors, such as age at enrollment (per 1 year), male gender, and cigarette smoking were always significantly associated with increased risk of presence and severity of carotid atherosclerosis.

Second, if the number of CVD comorbidity is a critical factor, the risk should be dependent the number of CVD comorbidity, from lower risk factor by presence of one CVD comorbidity alone, intermediate risk by presence of two CVD morbidities, and high risk by presence of three CVD morbidities. However, we can find that the OR (5.29, 95% CI 2.39-11.75) was highest in the DM plus hypertension group and even higher risk of carotid atherosclerosis in the DM and hyperlipidemia group (OR 4.79, 95% % 1.63-14.09) compared to the OR of 4.07 (95% CI 2.20-7.51) in the all (DM plus hypertension plus hyperlipidemia) group for the moderate or severe carotid atherosclerosis, suggesting the bias of the authors' study is high.

Third, if hypertension is so important, the authors' data also failed to support their conclusion. The authors showed that OR in the hypertension and hyperlipidemia group is 2.71 (95% CI 1.68-4.36), which was dramatically lower than those ORs (4.79 and 5.29, respectively) in the DM plus hyperlipidemia group and the DM and hypertension group, respectively. If the aforementioned data are real, does it mean the synergistic effect of DM is far and far critical compared to hypertension? In fact, previous studies have shown DM may share similar underlying pathophysiology for many diseases, and of course, atherosclerosis is also included.[2,3]

The comments shown above did not argue the value of the authors' contribution and effort to enhance the global health of human beings; however, clinical relevance may be more important to scientific finding.[4,5] We hope to learn more from the authors' positive response.

REFERENCES

1. Lu SX, Wu TW, Chou CL, Cheng CF, Wang LY. Combined effects of hypertension, hyperlipidemia, and diabetes mellitus on the presence and severity of carotid atherosclerosis in community- dwelling elders: a community-based study. *J Chin Med Assoc* 2023;**86**:220–6.
2. Lee WL, Wang PH, Yang ST, Liu CH, Chang WH, Lee FK. To do one and to get more: Part I Diabetes and bone. *J Chin Med Assoc* 2022;**85**:965–71.
3. Lee WL, Wang PH, Yang ST, Liu CH, Chang WH, Lee FK. To do one and to get more: Part II. Diabetes and metabolic dysfunction-associated fatty liver diseases. *J Chin Med Assoc* 2022;**85**:1109–19.
4. Chang WH, Yang ST. Antibiotics use and worse outcome: a possibility of misinterpretation. *J Chin Med Assoc* 2022;**85**:1163.
5. Li YT, Chang WH. The statistical significance may be misinterpreted. *J Chin Med Assoc* 2023;**86**:534.

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