Reviewer's report

Title: Carotid intima-media thickness is associated with cognitive deficiency in hypertensive patients with elevated central systolic blood pressure

Version: 1 Date: 25 December 2011

Reviewer: Eva Gerdts

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The authors aimed to identify factors associated with cognitive impairment in hypertension, in particular the relation with increased carotid intima-media thickness (IMT) and central blood pressure. A total of 150 hypertensive patients and 50 control subjects were recruited for this cross-sectional analysis. Cognitive impairment is a major and costly health problem, so the topic is important and interesting. However, the actual data set is insufficiently explored, limiting the interpretation of results. In particular, the following points should be addressed:

1. No abstract is presented
2. The references are out of order
3. The abbreviation CI should not be used for cognitive impairment. You also use the same for confidence interval, which may be disturbing for the reader.
4. Detailed information on how these study participants were recruited should be provided. In particular it is unclear how normotensive controls were recruited as they were significantly younger than the hypertensive patients which may flaw the study analysis.
5. It is well known that antihypertensive treatment influences IMT and central blood pressure, and differences among drug classes have been reported. Information on antihypertensive treatment should be added to table 1 and treatment should be included among the covariates in a revised multivariate analysis.
6. The inclusion criterion ‘regularly attending medical consultations’ should be explained and probably rephrased.
7. The importance of measuring blood pressure correctly is stressed by the authors. It should be clarified if clinical blood pressure was measured in the sitting or supine position. Furthermore, the lack of ambulatory blood pressure should be included in the discussion and in study limitations.
8. How was 24 hour sodium excretion measured? Include this as well as how microalbuminuria was measured in the method section.
9. The method used for assessing carotid IMT should be better described in the text including if only the common carotid artery was analyzed and if both near and far field wall was included in the analysis. Both mean and peak IMT and the prevalence of carotid plaque should be included. When the text is adequately revised, figure 1 can be omitted.
10. Figure 1 suggests that the internal carotid artery was not studied. If so, please include this factor in the discussion. Is it possible that atherosclerosis in the internal carotid artery may reflect cerebral circulation and function even better than IMT in the common carotid?

11. The guidelines advocate that central blood pressure should be estimated from carotid or aortic pulse wave analysis. In the current study radial pulse wave analysis was used. Why was this suboptimal strategy chosen? Possible influence on study results should be discussed.

12. The statistical approach is not well described. Univariate associations with cognitive impairment should be tested by Pearson’s correlation. Building of the multivariate model should be done based on univariate associations and collinearity diagnostics. Covariates of IMT, central blood pressure and finally cognitive impairment should be presented fully. In particular the relation between steady and pulsatile measures of blood pressure should be explored.

13. The same results should not be presented both in text and tables.

14. In the result text, 4 different patient groups appear: AH-CI, HA-AD, HA and NT. This differs from the description in methods and the results in the tables. Please clean up, so methods and results are concordant.

15. Units are lacking in table 1. Also use period as decimal separator.

16. Table 3 and 4 can be taken out as results are presented in Figure 4 and 5.

**Level of interest:** An article whose findings are important to those with closely related research interests

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

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I do not have any competing interest in this field as my research is all about hypertensive heart disease.