



LETTER TO THE EDITOR

Association between anxiety and depression symptoms with resistant hypertension and central hemodynamics: A pilot study



The hypothesis that symptoms of anxiety and depression contribute to the development of hypertension has been controversial. Rutledge and Hogan¹ found that the risk of developing hypertension is approximately 8% higher among people with psychological distress compared to those with minimal distress. People suffering from either severe depression or anxiety were two to three times more likely to develop hypertension².

The aim of the present pilot study was to compare the prevalence of anxiety and depression in patients with resistant HTN (rHTN) who underwent renal denervation (RDN) versus medical management alone. An additional aim was to assess possible associations with central hemodynamics using the cardio-ankle vascular index (CAVI).

The study included 34 patients who lacked a comorbid mental health disorder, had rHTN and were a mean age of 58.3 ± 11.2 years. Twenty-four hour ambulatory blood pressure monitoring (24 hABPM) was conducted in all patients, and they were divided into the following groups: group I ($n = 20$) underwent RDN and group II ($n = 14$) was treated with medical management alone. The mean office SBP and DBP measurements for group I were 163 mmHg and 92 mmHg, respectively; for group II, they were 159 mmHg and 91 mmHg, respectively. There was no significant difference in the duration of hypertension (10.1 vs 9.4 years, $p = \text{NS}$) or in the familial burden. Finally, there was no difference in the number of antihypertensive medications in the two groups (5.1 vs 5.5, $p = \text{NS}$).

The evaluation of anxiety disorder was performed with the Hospital Anxiety Depression Scale (HADS)^{3,4}. The Beck Depression Inventory (BDI) was used to evaluate depression⁵. Both scales consist of a simple, yet reliable, self-assessment screening questionnaire. For the HADS scale, a score of ≥ 11 is thought to indicate a significant case of psychological morbidity. The BDI is a 21-item self-report depression inventory that measures depressive symptoms. For each item, the score ranges from 1 to 4. The total score

is obtained by summing the scores on each of the 21 questions.

CAVI was measured with a Vasera VS-1500 (Fukuda Denshi, Tokyo, Japan) vascular screening device⁶.

Descriptive and univariate comparisons were made using SPSS (version 20.0). Due to the low number of subjects in each group, only non-parametric tests were used (Spearman for correlations, Mann-Whitney U-test for comparison of groups and Chi square for categorized comparisons). A p -value of 0.05 was set as the cut-off for significance.

The HADS and BDI scores were highly correlated in the entire group [correlation coefficient (CC) = 0.787, $p = 0.0001$] as well as separately in each of the two groups [group I (CC) = 0.825, $p = 0.0001$ and group II (CC) = 0.779, $p = 0.0001$, respectively]. When comparing HADS and BDI scores between the two groups, no significant difference was identified.

Comparing CAVI results, CAVIR, but not CAVIL, was significantly higher in group I ($p = 0.02$). In group II, there seems to be a negative correlation between the CAVIR, CAVIL and HADS scores [CAVIR-HADS CC = -0.597, $p = 0.024$; CAVIL-HADS CC = -0.668, $p = 0.009$].

This small pilot study showed that there is a significant correlation between the two scores in the total population; however, patients treated with RDN are not different from those with medical management alone. A negative association was also noted between the anxiety scoring scale and CAVIR and CAVIL in patients treated with medical management alone.

A previous study documented a lack of difference in the prevalence of panic, anxiety and depression between patients with rHTN and non-resistant controls⁷. In agreement with our study, the prevalence of anxiety and depression was high in the two groups of patients with rHTN; however, the RDN made no difference in the total impact of the two modalities, which is in contrast with previous results⁸.

To the best of our knowledge, this report describes the first attempt to associate the arterial stiffness using the CAVI with anxiety and depression in this population. In a previous study, there was an association between an

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increased arterial stiffness, autonomic disbalance and depression in a young hypertensive population⁹.

The present study is a small pilot study that highlights the higher prevalence of depression and anxiety in patients with resistant hypertension, as well as a negative association with central hemodynamics. However, because the sample is small, acquisition of a larger sample size with the continuation of this study might reveal stronger correlations in the future.

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