THRESHOLDS OF IMPAIRED CEREBRAL HEMODYNAMICS THAT PREDICT SHORT-TERM COGNITIVE DECLINE IN ASYMPTOMATIC CAROTID STENOSIS

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INTRODUCTION.

Subjects with asymptomatic internal carotid artery stenosis (ACS) may be at risk of cognitive impairment due to cerebral hypoperfusion. In this study, we aimed to detect a threshold of cerebral hemodynamic status which is able to identify subjects at risk of cognitive deterioration.

METHODS.

In subjects with ACS, the global cognitive status was assessed using the Mini Mental State Examination (MMSE) at baseline and at one year. Demographics and vascular risk profile were recorded. As a measure of cerebral hemodynamics we assessed cerebral vasomotor reactivity (CVR) to hypercapnia with the breath-holding index (BHI) transcranial Doppler-based method. Cognitive deterioration at the end of the follow-up period was defined as a decrease in the MMSE score by at least two points. In order to define the threshold of impaired BHI, a ROC curve analysis was performed adopting the binary difference of MMSE score as the outcome and continuous BHI as the testing variable.

RESULTS.

548 subjects completed the follow-up. Cognitive deterioration was observed in 119 patients (21.7%). The BHI value ipsilateral to the stenosis was the strongest predictor of cognitive deterioration among the variables tested. The best cut-point to discriminate between normal and abnormal BHI resulted ≤0.89. The post-test probability of cognitive deterioration for an abnormal BHI was 44%, while a normal BHI showed a post-test probability of 9% for the same outcome.

DISCUSSION

The present investigation provides a specific threshold of reduced CVR that can be useful to identify subjects with ACS at high risk of cognitive deterioration.

CONCLUSIONS.

Given all the implications for individuals and societies of 'loss of cognition' – its prevention, along with stroke events, should be considered as a factor in determining the balance of the risks and benefits of therapy for carotid steno-occlusive diseases. Further investigations are needed to test whether implementing a more aggressive treatment approach in stroke-free ICA stenosis patients with hemodynamic impairment may reverse the impairment and ultimately reduce their risk of cognitive deterioration.

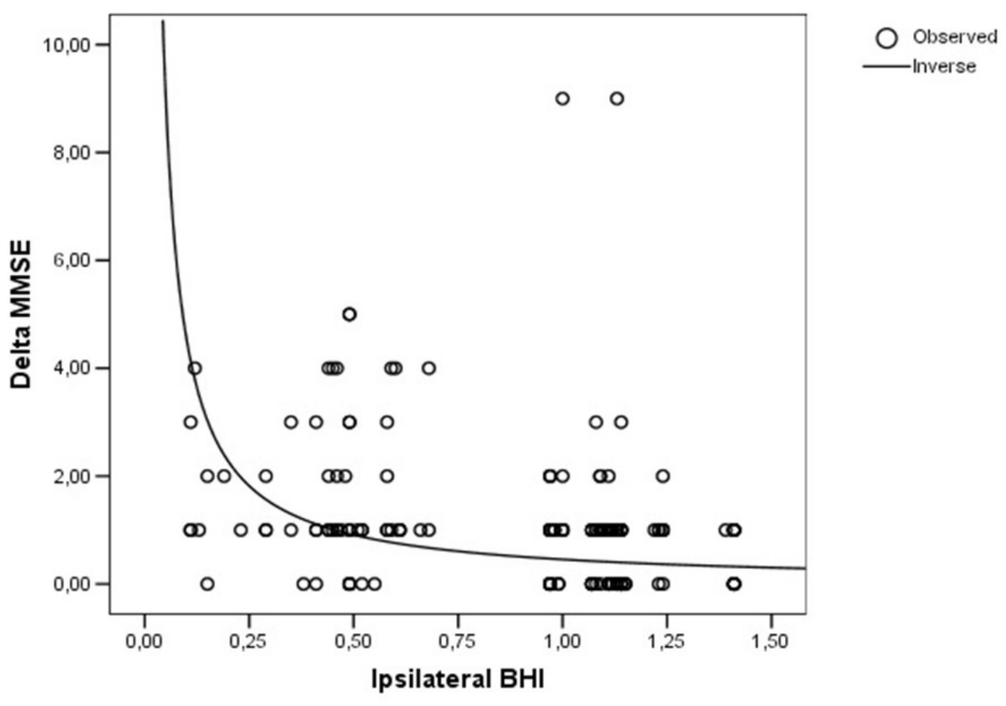
TABLE 1: Demographic and clinical characteristics in the study subjects classified according to a pathologic (BHI≤0,89) or normal cerebrovascular reactivity to apnea (BHI>0,89). Significant differences are marked with an asterisk (*).

VARIABLE	BHI≤0,89	BHI>0,89	p
Age	70,15 (±3,97)	69,83 (±5,22)	0,459
Mean IMT	0,99 (±0,16)	0,98 (±0,17)	0,522
MMSE (T0)	26,59 (±0,88)	26,79 (±1,19)	0,116
MMSE (T12)	24,38 (±1,79)	26,02 (±1,65)	0,0001 (*)
Education	10,19 (±3,24)	10,44 (±3,84)	0,442
Female Sex	32,0%	34,8%	0,572
Smoking	18,8%	19,4%	0,910
Diabetes	19,3%	16,5%	0,415
Dyslipidemia	28,9%	21,9%	0,078
Hypertension	58,4%	56,7%	0,720
Alcohol	4,6%	4,6%	1,000
Atrial Fibrillation	2,5%	2,9%	1,000
Coronary Artery Disease	7,1%	6,0%	0,591
Peripheral Artery Disease	7,1%	3,7%	0,099

TABLE 2: Results of the multivariate Cox regression model. Significant differences are marked with an asterisk (*).

Covariate	RR (95%CI)	p
Ipsilateral BHI*	4.439 (95%CI:2.960-6.658)	0.0001
Age	1.009 (95%CI:0.965-1.055)	0.694
Education*	0.942 (95%CI:0.890-0.997)	0.040
Sex	1.383 (95%CI:0.914-2.095)	0.125
Smoking	1.278 (95%CI:0.820-1.992)	0.279
Diabetes	0.971 (95%CI:0.600-1.569)	0.903
Dyslipidaemia	1.000 (95%CI:0.658-1.521)	0.999
Hypertension	0.922 (95%CI:0.631-1.348)	0.676
Alcohol	0.684 (95%CI:0.243-1.930)	0.473
AF	0.668 (95%CI: 0.159-2.806)	0.582
CAD	1.137 (95%CI:0.557-2.319)	0.725
PAD	1.235 (95%CI:0.604-2.528)	0.263

FIGURE1: Relationship between ipsilateral BHI and delta MMSE (p<0.001; r2=0,318).



REFERENCES

- Balestrini S, et al. Severe carotid stenosis and impaired cerebral hemodynamics can influence cognitive deterioration. Neurology. 2013;80:2145-2150.
- Buratti L, et al. Cognitive deterioration in bilateral asymptomatic severe carotid stenosis. Stroke. 2014;45:2072-2077.
- Silvestrini M, et al. Impaired cerebral vasoreactivity and risk of stroke in patients with asymptomatic carotid artery stenosis. JAMA. 2000;283:2122-2127.

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