PREDICTIVE FACTORS OF CEREBROVASCULAR EVENTS FOLLOWING CAROTID ARTERY STENTING

M.A. Gamero¹, F. Moniche², F. Mancha², I. Escudero-Martínez², A. Tomasello³, M. Ribó⁴, F. Delgado⁵, J.J. Ochoa⁶, J.A. De las Heras⁷, J.C. Gómez-Sánchez⁸, J. Zamarro⁹, G. Parrilla¹⁰, M. González-Delgado¹¹, E. Murias¹², J. Gil¹³, R. Gil-Gimeno¹⁴, A. Luna¹⁵, A. Gil-García¹⁶, J. Montaner¹, A. González¹⁷.

1HUV Macarena. IBIS., Neurology, Sevilla, Spain. 2HUV Rocío. IBIS., Neurology, Seville, Spain. 3H. Vall d'Hebron, Interventional Neuroradiology, Barcelona, Spain. 4H. Vall d'Hebron, Neurology, Barcelona, Spain. 5H. Reina Sofía, Interventional Neuroradiology, Córdoba, Spain. 6H. Reina Sofía, Neurology, Córdoba, Spain. 7HU Salamanca, Interventional Neuroradiology, Salamanca, Spain. 8HU Salamanca, Neurology, Salamanca, Spain. 9HV de la Arrixaca, Interventional Neuroradiology, Murcia, Spain. 10HV de la Arrixaca, Neurology, Murcia, Spain. 11HUC Asturias, Neurology, Oviedo, Spain. 12HUC Asturias, interventional Neuroradiology, Oviedo, Spain. 13H Clínico de Valencia, Interventional Neuroradiology, Valencia, Spain. 14H Clínico de Valencia, Neurology, Valencia, Spain. 15HU Cruces, Neurology, Bilbao, Spain. 16HU Cruces, Interventional Neuroradiology, Bilbao, Spain. 17HUV Rocío. IBIS., Interventional Neuroradiology, Seville,

BACKGROUND AND AIMS

Carotid artery stenting (CAS) is an effective and minimally invasive method for the treatment of extracranial carotid artery stenosis. The aim of the present study was to search for independent risk factors to predict cerebrovascular events following CAS in order to identify high risk patients and make CAS even safer among those.

METHODS

HISPANIAS, a national prospective multicenter study with 14 recruiting hospitals, collected data from 757 procedures in 725 patients who underwent CAS. We analyzed morbidity and mortality within 30 days after CAS looking for factors that might be associated with cerebrovascular events (stroke and TIA).

RESULTS

The HISPANIAS cohort included 80.3% men and 19.7% women, with mean age of 70.7 years, 38.6% were diabetics, 76.6% hypertensives, 61.6% had dyslipidemia, 29.5% heart disease, 28.1% were current smokers, 10.4% had atrial fibrillation, and 7.8% had chronic renal failure.

Cerebrovascular complications at 30 days occurred in 42 patients (5.6%), including TIA in 24 patients (70.8% ipsilateral; mean 2.79 days after CAS) and stroke in 18 patients (72.2% ipsilateral; mean 6.72 days after CAS). Six patients (0.8%) died after CAS. Morbidity (any stroke) and mortality rates were 3.1% in the whole cohort.

Main independent clinical predictors of stroke/TIA identified by logistic regression were: females OR 3.8 (1.05-14.2, p=0.041) and diabetes OR 7.4 (1.7-31.7, p=0.007).

For stroke alone the main independent predictors in the logistic regression (age, diabetes, blood pressure, post-CAS systolic peak MCA velocity) allowed to build a predictive model with an AUC=0.89.

STROKE OR TIA

	NO	YES	p
n (%)	715 (94.5)	42 (5.5)	
Female	135 (18.9)	14 (33.3)	0,022
Male	580 (81.1)	28 (66.7)	
Mean age	71±9	72±10	0,392
Diabetes	265 (37.1)	27 (64.3)	0,001
Hypertension	546 (76.4)	34 (81.0)	0,751
Dyslipidemia	438 (61.3)	28 (66.7)	0,694
Heart disease	211 (29.5)	12 (28.6)	0,877
Smokers	200 (28.0)	13 (31.0)	0,397
Atrial fibrillation	75 (10.5)	4 (9.5)	0,837
Intermittent claudication	124 (17.3)	7 (16.7)	0,811
Chronic renal failure	55 (7.7)	4 (9.5)	0,672
SBP (mmHg) mean, SD	138±23	135±27	0,471
DBP (mmHg) mean, SD	71±14	74±22	0,709
PSV post-CAS (M1-ipsMCA)	102.55 ± 36.4	84.99 ± 24.9	0,012

Demographic data

Male 80.3% Female 19.7% Mean age 70.7 ± 9.2

Cerebrovascular complications at 30 days

Type	TIA	Stroke
Patients	24 (3.2%)	18 (2.4%)
Ipsilateral	70.8 %	72.2 %
Days after CAS	2.79	6.72

ROC curve

STROKE

	NO	YES	p
n (%)	739 (97.6)	18 (2.4)	
Female	143 (19.4)	6 (33.3)	0,140
Male	596 (80.6)	12 (66.7)	
Mean age	71±9	77±8	0,002
Diabetes	280 (37.9)	12 (66.7)	0,011
Hypertension	564 (76.3)	16 (88.9)	0,298
Dyslipidemia	456 (61.7)	10 (55.6)	0,459
Heart disease	218 (29.5)	5 (27.8)	0,879
Smokers	211 (28.0)	2 (11.1)	0,134
Atrial fibrillation	77 (10.4)	2 (11.1)	0,948
Intermittent claudication	130 (17.6)	1 (5.6)	176
Chronic renal failure	56 (7.6)	3 (16.7)	0,166
SBP (mmHg) mean, SD	138±23	134±34	0,620
DBP (mmHg) mean, SD	72±14	67±13	0,365
PSV post-CAS (M1-ipsMCA)	102.51 ± 36.2	79.75 ± 24	0,042

CONCLUSION

- Elderly, females and diabetic patients are more vulnerable to perioperative cerebrovascular complications after CAS.
- Moreover, some hemodynamic measurements might help to define the stroke risk in this population in order to improve cerebrovascular events prevention.