

Clinical evolution of elderly patients with ischemic stroke

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To the editor:

The aging of the population has a significant impact on public health and health care¹. The world population over 60 has doubled since 1980, and forecasts indicate that it will reach 2 billion by 2050². This situation poses special health challenges for the 21st century. Given that the risk of cerebrovascular illness is directly correlated with age, a progressive increase in the incidence of stroke is expected in the near future¹. Despite these facts, patients over 80 years are under risk of receiving sub-optimal medical care and having less access to stroke care^{3, 4} because doubts about the benefit and security of intravenous fibrinolytic therapy (FT)⁵ or the use of endovascular treatment⁶ in this age segment have been raised. We developed a study to compare clinical characteristics, management and evolution of stroke patients admitted to a university hospital, with access to the Stroke Unit (SU) and FT, irrespective of age. Of the 1,205 subjects evaluated between April 2011 and October 2014, we included 740 patients with ischemic stroke (table). As in recent studies, we observed an important number of older patients⁷, 224 patients (30.3%) were over 80 years. FT was administered to 10.8% of subjects whereas 40% of patients were admitted to the SU. At discharge, 420 (56.8%) patients were completely independent (measured on the modified Rankin Scale [mRS] < 3).

According to previous reports^{3, 7-9}, the older patients showed a differential clinical profile. There were significantly more women in the group of patients over 80. Hypertension (HT), prior atrial fibrillation (AF) and ischemic heart disease (IHD) were also significantly more frequent in the older group of patients. The use of anticoagulant, antiplatelet, antihypertensive medications and the activation of

stroke code were more prevalent in this group as well. Also, patients over 80 were classified as total anterior circulation infarction (TACI) in a greater proportion and lacunar anterior circulatory infarct (LACI) in a lesser proportion than younger patients. Older patients were treated more often with FT (16.5% versus 8.3%). No differences were observed between groups with access to the SU, although there were more complementary tests done in younger patients. The proportion of subjects with CE was significantly higher in the older group. Interestingly, in contrast with previous studies^{3, 10}, we did not observe any difference in the median hospital stay between groups, probably related to the existence of a good network of recovery centers in the Lleida Health Region and a good level of care during admission to Neurology, similar to that of young patients. In this sense, we should emphasize that our global mortality (3.9%) was lower than that described previously^{3, 7, 8}.

Greater mortality and mRS > 2 were associated with: female sex, previous AF, IHD, previous mRS score, stroke severity measured on the National institute of health stroke scale (NIHSS), cardioembolism (CE), symptomatology compatible with TACI and the development of febrile syndrome. The development of heart failure (HF) and age over 80 were associated with a poor prognosis in the whole cohort of patients. The analysis of the area under the receiver operating characteristic curve shows a good capacity for the NIHSS scale to predict mRS>2 and death during admission, with a value under the curve of 0.82 (0.79-0.85) and 0.87 (0.81-0.92), respectively. The predictive capacity of the stroke prognostication using age and NIHSS (SPAN) index (0.68 [0.64-0.72]) and age (0.59 [0.55-0.63]) was less significant.

Despite higher initial stroke severity and the development of more medical complications among older patients, age did not play a predictive role for poor prognosis measured by the mRS scale and mortality during admission. In the multivariate analysis using logistic regression, history of IHD (Odds ratio [OR] 1.59 [95% CI 1.01-2.30], $p=0.014$), the NIHSS score (OR 1.24 [95% CI 1.19-1.29] $p<0.001$), development of febrile syndrome (OR 3.03 [95% CI 1.34-6.86], $p=0.008$) and cardiac failure (OR 8.52 [95% CI 0.96-75.66], $p=0.054$) were independent predictors of $mRS>2$. Finally, independent of age, NIHSS score (OR 1.11 [OR 1.06-1.17], $p<0.001$), suffering a TACI (OR 2.39 [95% CI 1.43-3.98], $p=0.001$) and development of HF (OR 6.24 [95% CI 1.01-38.40], $p=0.048$) were predictors of death during admission. The predictive capacity of the NIHSS among patients over 80 was similar to that observed in the whole cohort of patients (area under the ROC curve: 0.81 [0.75-0.86] for $mRS>2$ and 0.83 [0.74-0.93] for death).

In conclusion, despite the fact that older patients have more risk factors and their own etiology, in an academic Hospital with access to stroke code and FT regardless of age, initial clinical severity and the development of medical complications were more important predictive factors for ischemic stroke evolution than age.

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