

## Can we avoid the Hemorrhagic strokes? MIPSE criteria among attended population and temporal trends.

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### Background

The European population above 65 years of age will double by 2050 as well the risk of intracranial hemorrhage (ICH). The aim of this study was to assess the association between the incidence ICH and the prevalence of known associated risk factors (avoidable incidence).

### Methods

The Ebrictus Registry study is a cross-sectional, multicentre study of stroke incidence among out-of-hospital patients over 15 years old attending primary care teams in the Terres de l'Ebre health area in Catalonia. We reviewed consecutive adult patients with ICH between 04/2006-06/2015 from Catalan registries. We analyzed patient demographics, NIHSS, medical co-morbidities, pharmacological information, length of stay, treatment, Barthel and Rankin score, therapeutic time in range (TTR%) by Rosendaal method, disposition to home, rehabilitation facility, nursing home, hospice, or death. Temporal trends in ICH incidence. Event rate ratios and avoidable cases with treatment or prevention measures were calculated according the Unnecessarily Premature and Sanitarily Avoidable Mortality (MIPSE) classification, a matched odds ratio (OR) was calculated for ICH occurrences, and Cox proportional hazard models were used.

### Results

240 cases were included (143 H 97 W). The cumulative incidence of ICH was 26.3/10<sup>5</sup> per year. The rate-ratio was 0.68 [CI95% 0.52-0.88], p 0.004. 43.7% occurred in patients aged ≥80 years. Women with ICH were older than men (77.12±12.47 vs. 73.3±12.4, p=0.02). Males had higher prevalence of smoking (p <0.002), alcoholism (p=0.004), chronic liver disease (p=0.028), and chronic renal insufficiency (p 0.007). An increase in the prevalence of ICH is seen, progressing from 7.9% (period 2006-2008) to 14.8% (December/2014, p<0.001). The alcoholism [OR 13.4], antidepressant selective serotonin (SSRI) reuptake inhibitor [OR=3.70], hypertension [R=2.89], and polimedication [OR=2.21] were identified as the main risk factors for ICH incidence.

Forty percent were associated to avoidable factors, being the hypertension (19.6%) and the traumatism (16.4%) the ones that presented in 89,7% of all patients ICH. The avoidable ICH incidence is 66.6% of all cases among people under 75 year-old and 22.7% of those ones ≥75 year-old. The overall avoidable ICH incidence could be around 36.6%.

Women present a lower Barthel score after episode (72.3±29.7 vs. 82.0±23.3) and higher Rankin score (3.7±1.4 vs. 2.6±1.5) than men. Older age, pre-stroke disability, and female gender were independent predictors of poor outcome at discharge.

The women had higher mortality than men (p 0.069). The risk of mortality is different according associated risk factor and age. The factors associated with poor outcomes were: age (OR 1.18 per year [CI95% 1.07-1.29], p <0.001), oral anticoagulant treatment (OR 4.65 per year [CI95% 1.10-19.6], p 0.036), polimedication (OR 1.08 [CI95% 1.03-1.13], p 0.001), and selective inhibitor serotonin reuptake antidepressant (OR 9.71 [CI95% 1.23-76.68], p 0.031). Those ones neither traumatic brain injury (TBI) nor OAC survived two times (44%) more than those ones with OAC and ITB (23%).

### **Conclusion**

Around 66.6% of ICH in patients <75 year-old could be avoidable.

### **Clinical Relevance.**

Intracerebral hemorrhage (ICH) is a devastating event, carrying a very high morbidity and mortality rate. The past decade a notable transformation has taken place in the demographic composition characterized by the ageing associated to an increased comorbidity for cardiovascular risk factors and chronic pathologies which, in addition, are associated with the presence of polimedication in people over 65 years old.

The MIPSE classification doesn't include relevant risk factors associated that can explain partially a major risk associated with an aging population as the polimedication, OAC and/or SSRI treatment, and chronic renal insufficiency.