Predictors of Occurrence and Anatomic Distribution of Multiple Aneurysms in Patients with Aneurysmal Subarachnoid Hemorrhage

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BACKGROUND
The literature on multiple intracranial aneurysms (MIA) in patients with aneurysmal subarachnoid hemorrhage (aSAH) focuses largely on risk factor analysis and consists essentially of retrospective cohort studies of limited sample size, or studies in populations outside Europe and North America. The purpose of this cohort study was to identify predictors for aneurysm multiplicity and to investigate the anatomic distribution of MIA in a representative Western cohort of patients with aSAH.

METHODS
The Swiss Study of Subarachnoid Hemorrhage (SOS) database includes anonymized data from all tertiary neurovascular facilities in Switzerland. The dataset for 2009-2014 was used to compare characteristics of patients with aSAH and MIA and those with a single intracranial aneurysm (SIA) by means of descriptive and multivariate regression analysis.

RESULTS
Among 1689 unselected patients with aSAH, 467 had MIA (prevalence, 27.6%). The location of the ruptured index aneurysm was correlated with the probability of finding bystander aneurysms and predicted their likely anatomic distribution. Patients with a ruptured basilar artery aneurysm (odds ratio [OR], 2.11; 95% confidence interval [CI], 1.30-3.44) or a ruptured middle cerebral artery aneurysm (OR, 1.86; 95% CI, 1.35-2.55) were at the greatest risk for having MIA. Larger size of the index aneurysm (OR per 1 mm, 1.03; 95% CI, 1.01-1.06) was also positively correlated with aneurysm multiplicity. Males were less likely than females to have MIA (OR, 0.79; 95% CI, 0.61-1.01).

CONCLUSIONS
In patients with aSAH, the location of the ruptured index aneurysm is correlated with the probability of finding bystander aneurysms, and is predictive of the sites at which bystander aneurysms are most likely to be found.

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