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Epidemiology-based evaluation of trends in treatment for ruptured intracranial aneurysms in Italy

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Abstract

Background: In recent years there have been significant advances in the diagnosis, management and treatment of intracranial aneurysms (IAs) in Italy. Changes in prevalence of several epigenetic risk factors in the population as well as in environmental factors may have influenced the epidemiological burden of this disease. No long-term, population-based study about the incidence of treated ruptured IAs (rIAs) in Italy has yet been reported in literature.

Methods: A long-term (January 2015 - December 2020), nationwide epidemiology study was performed by using discharge data collected by the Italian National Agency for Regional Healthcare Services with a particular focus on the treatment incidence of rIAs. A sub-analysis per macro-areas (north, center, and south and islands) was also performed, including the data about regional healthcare systems organization. The prevalence of common epigenetic and environmental risk factors has been also assessed.

Results: Over 6 years, the mean incidence of rIAs treatment was 2.7 x 100.000 per year ($ds \pm 0.1$; range: 2.6-2.9). In 2020, there was a significant north-south decreasing gradient in incidence (north vs center vs south and islands: 3.4 vs 2.4 vs 1.8 x 100.000/year; all $p < 0.001$). There were no meaningful differences between macro-areas in terms of access to emergency care and number of neurosurgical wards per population. The rate of unruptured IAs (uIAs) treatment did not show a correlation to that of ruptured ones. Minor regional differences were retrieved for high-risk hypertension as well as for alcohol abuse prevalence. Air pollutants and temperature charts showed a north-south gradient similar to that of the incidence in the treated rIAs.

Conclusions: The mean incidence of treated rIAs was stable over the 2015-2020 period in Italy. A north-south decreasing gradient in rIAs treatment incidence was reported. Neither the Regional healthcare organizations nor the rate of uIAs treatment were significant factors explaining the regional differences in the incidence of rIAs treatment. Minor differences in epigenetic and environmental risk factors may be synergistically involved.