

Intracranial aneurysm diameter and risk of rupture

O diâmetro de aneurismas intracranianos e o risco de ruptura

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Dear Editors,

We read with great interest the article, “Bleeding risk of small intracranial aneurysms in a population treated in a reference center” by Lepski et al.¹, in which the authors proposed a new method to address the relationship between aneurysm size and the prevalence of rupture.

Perfect studies on the risk of aneurysm rupture do not exist, therefore physicians have been obliged to settle for sub-optimal epidemiological evidence. As a consequence, the conclusions of many studies have been accepted despite scientific limitations in their methods.

In the past two decades, some evidence has been published showing that rupture rates of small aneurysms are extremely low. Despite the bias involved in the International Study of Unruptured Intracranial Aneurysms (ISUIA) study², especially regarding the nonconsecutive recruiting method, it is the most powerful study ever published. The annual rupture rate for aneurysms smaller than 10 mm in a patient with no previous subarachnoid hemorrhage was extremely low. According to the ISUIA, the larger the aneurysm, the greater the risk of rupture. This finding is in accordance with other studies.

Lepski et al.¹ retrospectively studied a population of 290 patients harboring both ruptured and non-ruptured newly-diagnosed aneurysms. The mean largest diameter for the ruptured versus unruptured groups was 13.3 mm ± 1.7 mm versus 22.2 ± 2.2 mm. Only 21.8% of the aneurysms measured less than 5 mm. A mean diameter larger than 20 mm for non-ruptured aneurysms seems not to be representative of the whole population of unruptured aneurysms, as the vast majority of them are quite a bit smaller than that. The study being

conducted in a tertiary neurosurgical center could explain that discrepancy. Are the included patients representative of the whole German population?

The term “bleeding risk” used in the article title is a common pitfall in statistical analysis. Calculation of risk requires the use of “people at risk” as the denominator. In retrospective studies, where the total number of exposed people is not available, risk cannot be calculated. It is more suitable to use the expression “association” to represent the higher probability of the occurrence of an event. Therefore, based on the study methodology, it is clear that the conclusion that small aneurysms were more prone to bleed is, at least, not accurate. The design of the study does not allow that conclusion. The authors could conclude that in a specific population, aneurysms that presented with bleeding at the time of diagnosis were more prone to be small. The results cannot be extrapolated to the general population.

About 2% of the worldwide population have an unruptured aneurysm³. The vast majority of them are quite small. Therefore, we can expect that most ruptured aneurysms will be small.





In the worst scenario, data are summarized and extrapolated to generate general recommendations, guidelines, or risk prediction models. In relatively-small scientific communities, the risk of reporting and publishing biases may also partly contribute to the expansion of unwarranted extrapolations.

The research efforts to identify risk factors for unruptured aneurysms should be directed to prospective studies, especially those including an unselected cohort.

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