LETTER TO THE EDITOR

Outcome Predictors of an Intracerebral Hemorrhage also Depend on the Causes of the Bleeding

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Dear Editor,

We read with interest the article by Al-Alawi et al. on a retrospective cohort study of the outcome predictors of intracerebral hemorrhage (ICH) in 89 patients admitted to the emergency department.[1] Predictors of outcome were hematoma size, followed by midline shift, ventricular intrusion, arterial hypertension, and low Glasgow Coma Scale (GCS).[1] A favorable outcome [modified Rankin Scale (mRS) <3] was observed in 47.2% of patients, severe disability (mRS 3–5) in 30.3% of patients, and 22.5% died (mRS 6).[1] The study is excellent, but some points should be discussed.

The first point is that a number of potential predictors of outcome were not included in the assessment. As the outcome is highly dependent on the causes of ICH, it is crucial to know the individual causes of ICH in each patient.

Multiple causes of angiopathy were not included in the assessment. As 32 patients had lobar hemorrhage and lobar hemorrhage is often due to amyloid angiopathy, it would have been essential to indicate how many of these patients had lobar hemorrhage due to hereditary or acquired amyloid angiopathy.[2] It would also have been useful to indicate how many of the included patients had CADASIL, which is associated with ICH in 2% of patients.[3] In addition, patients with autosomal dominant pontine microangiopathy and leukoencephalopathy (PADMAL) and those carrying mutations in COL4A1 also have an increased risk of ICH.

Inherited or acquired platelet dysfunction was also not considered a cause of ICH and was not included in the analysis. An increased risk of ICH was found in patients with immune thrombocytopenia or heparin-induced thrombocytopenia.[4]

Coagulation disorders have also not been sufficiently considered as a cause of ICH. We should know how many patients had hemophilia, von Willebrand disease or afibrinogenemia, which were not considered causes of ICH.

Not only anticoagulants, heparin or antithrombotics can cause ICH, but also a number of other medications. These include antidepressants, antibiotics, NSAIDs (ibuprofen, naproxen, acetaminophen, diclofenac), coxibs, fenofibrate, glucocorticoids and proton pump inhibitors. Therefore, we should know the total current medication that the included patients were taking at the time of the onset of bleeding. Comorbidities such as hepatopathy and renal insufficiency can also increase the risk of bleeding.

Secondly, it was not reported in how many of the 89 patients the hematoma was surgically removed. Surgical intervention can strongly influence the outcome of ICH patients.

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The third point is the small group size. It is conceivable that the small number of patients was responsible for the finding that age, gender, heart disease, hypertension, diabetes, and use of anticoagulants are not predictors of ICH.

In conclusion, it can be said that this interesting study has limitations that relativize the results and their interpretation. Addressing these limitations could strengthen the conclusions and reinforce the message of the study. When analyzing the predictors of the outcome of an ICH, it is important to know the causes of the ICH. Potential outcome predictors of ICH that should be considered are angiopathy, coagulopathy, platelet dysfunction, co-medications and comorbidities.

Availability of Data and Material

All data are available from the corresponding author.

Author Contribution

JF: Responsible for the design and conception, discussed available data with coauthors, wrote the first draft, and gave final approval.

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