LETTER TO THE EDITOR

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

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Dear Editor,

We appreciate the authors' interest in our article, "Unveiling the Crystal Ball: Predictors of Adverse Outcomes in Intracerebral Hemorrhage Patients," and welcome the opportunity to address their insightful comments.[1] Here is a point-by-point clarification of the queries raised by the authors.

We acknowledge that amyloid angiopathy, whether hereditary or acquired, is indeed a significant factor associated with lobar hemorrhages.[2–4] As they correctly mentioned, this condition could impact the outcomes in patients with intracerebral hemorrhage (ICH). Nevertheless, we found lobar hemorrhages in 32 patients; however, overall, the location of the hematoma was not significant as a predictor of poorer outcome. Our study aimed to identify potential predictors of poorer outcomes, and while we recognize the importance of amyloid angiopathy, a more thorough evaluation would be required to include this factor comprehensively, which is only possible in a prospective study. While we did not assess the individual causes of ICH in this study, we appreciate your suggestion and will consider it for future research to provide a more comprehensive analysis.

It is essential to recognize that our study was primarily conducted in the Emergency Department (ED), with the main objective of identifying predictors of adverse outcomes in ICH patients. As an emergency physician, our immediate focus is on stabilizing patients and identifying the most pressing predictors of poor outcomes in an acute setting. While conditions such as cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL), pontine autosomal dominant microangiopathy and leukoencephalopathy (PADMAL), and mutations in collagen type IV alpha 1 (COL4A1) indeed increase the risk of ICH, the detailed evaluation for these specific genetic and inherited conditions requires a more specialized and comprehensive approach, often beyond the initial emergency assessment.[5,6] Similarly, while inherited or acquired platelet dysfunctions, including immune thrombocytopenia and heparin-induced thrombocytopenia, are important factors in the risk of ICH, our study's scope was limited to the acute management and immediate predictors in the emergency context. These conditions require specific diagnostic tests and evaluations that are typically conducted in a more controlled, non-emergent setting.

The authors are correct that coagulation disorders such as hemophilia, von Willebrand disease, and afibrinogenemia, as well as various medications including antidepressants, antibiotics, NSAIDs, coxibs, fenofibrate, glucocorticoids, and proton pump inhibitors, can be potential contributors to ICH.[7] However, due to the retrospective nature of our study, we were unable to include all these variables comprehensively. Additionally, our study was not focused on identifying the predictors of ICH, itself but rather aimed to determine the factors that could lead to adverse or poorer outcomes once an ICH has occurred. While understanding the total current medication and underlying coagulation disorders in patients would indeed provide valuable insights, our primary objective was to analyze the immediate predictors of outcomes in the acute setting. As mentioned in Table 2, comorbidities such as hepatopathy and renal insufficiency were indeed considered under the heading 'others.[1] However, they were not found to be significant contributors to the occurrence of ICH in our study, with a *p*-value of 0.521. While platelet dysfunction and coagulation disorders were considered potential contributors to poorer outcomes in ICH patients, our analysis did not find statistically significant associations for these factors (*p*-value: 0.319, and *p*-value: 0.889, *p*-value: 0.568). This observation is detailed in our findings, where these variables did not demonstrate significant correlations with the outcomes under investigation.

The limitations related to sample size are important considerations that contextualize our results and their interpretation. As mentioned in the limitations of our study, it is essential to recognize that our research primarily focused on identifying predictors of adverse outcomes in ICH patients within the ED setting. Therefore, we did not extensively explore neurosurgical interventions, including details such as the number of patients undergoing surgical hematoma removal or the timing of these procedures, which also plays an important role in the outcome.[8]

We would like to conclude that, as a retrospective study, missing data posed a challenge, and only variables with uniform documentation were included in our predictions of outcomes. It is

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important to note that our findings do not encompass all potential adverse outcomes, emphasizing the need for further research on this topic. Thank you for the opportunity to clarify these points and for your constructive feedback, which enhances the discussion around our study's findings.

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