Pre-existing Renal Failure Increases In-Hospital Mortality in Patients with Intracerebral Hemorrhage

We read with interest the study of Khatri et al that concluded pre-existing renal failure increased the risk of in-hospital mortality among patients with intracerebral hemorrhage (ICH).[1] These results were derived from a retrospective analysis of over 328,000 adult patients (11.8% with pre-existing renal failure) who were admitted to hospitals in the United States with ICH over a 5-year period.

In an unadjusted analysis comparing patients with versus without pre-existing renal failure, the incidence of in-hospital mortality was 26.4% versus 25.3% ($P = .001$). Using a multivariable analysis that controlled for patient characteristics, in-hospital complications, and exposure to invasive procedures, the independent association of pre-existing renal failure with in-hospital mortality remained statistically significant (odds ratio = 1.12, $P = .0025$). We back converted this odds ratio to proportions to assist with clinical interpretation. Ultimately, the adjusted odds ratios reported in the manuscript equate to in-hospital mortality risks of 27.6% and 25.3%, respectively. Based on these results, the authors suggest that pre-existing renal failure seems to be an important prognostic marker of in-hospital mortality in patients with ICH. We respectfully disagree with this conclusion. Despite the statistically significant associations reported in this study, one must also consider the strength of these associations.

In studies with very large sample sizes like the current study, statistically significant associations are often detected that have little clinical importance. The sample size in the current study was so large that, assuming a 25.3% mortality rate in patients without pre-existing renal failure, a mortality rate as low as 25.8% in patients with pre-existing renal failure would still have achieved statistical significance between groups at an alpha level of .05. Would one conclude from this statistically significant result that renal failure is an important prognostic marker of mortality in patients with ICH?

For a categorical variable such as renal failure, the threshold for defining a small or weak association using the odds ratio statistic is 1.5-1.7.[2,3] Given the odds ratio of 1.12 reported in the current study, we offer a conclusion that considerably differs from that of the authors—in patients with ICH, pre-existing renal failure has a very weak and likely clinically irrelevant association with the risk of in-hospital mortality and, therefore, its role as a prognostic marker in this patient population is extremely limited.

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https://doi.org/10.1016/j.jstrokecerebrovasdis.2019.04.030

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DOI of original article: http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2018.07.036.
1052-3057/$ - see front matter