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Letter to the Editor

All Influencing Factors must be taken into Account When Calculating the Outcome Parameters of Sinus Venous Thrombosis

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We were interested to read the article by Moniruzzaman *et al.* on a prospective study of the characteristics and outcome of venous sinus thrombosis (VST) in 81 patients treated at a tertiary center in Bangladesh between 11/2020 and 8/2022 ^[1]. It was found that the median modified Rankin Scale (mRS) score at three-month follow-up was 1, that 27% had a poor outcome (mRS 3-6) and that 10% died ^[1]. Factors associated with poor outcome were age >60 years, hemiparesis, impaired consciousness and involvement of the transverse sinus ^[1]. Poor outcome in older patients was positively correlated with D-dimer levels ^[1]. It was concluded that older age, hemiparesis and impaired consciousness were independent predictors of poor outcome in VST ^[1]. The study is excellent, but some points should be discussed.

The first point relates to the exclusion criteria. It is not clear why certain causes of VST, such as ischemic stroke with hemorrhagic transformation, AV malformation, hemorrhagic encephalitis, and mass lesion, were excluded from the analysis. It is also not clear why ischemic stroke was excluded, although VST is often complicated by ischemic stroke with or without secondary hemorrhage. If all patients with stroke after VST were excluded from the analysis, this should be explained.

The second point relates to the statement in the methods section that no prevalence figures are available for VST and therefore no power calculation was performed ^[1]. On the contrary, there are several studies that provide prevalence figures for VST ^[2, 3]. In a database study of more than 12 million discharges from pediatric departments over a four-year period, 3202 patients with VST were registered, corresponding to an in-hospital prevalence of 26.3/100000 discharges ^[3].

The third point refers to the information on treatment in the methods section ^[1]. It is stated that all included patients received both supportive and standard treatment for VST ^[1]. It should be specified what the authors mean by supportive and standard treatment and whether all patients really received both supportive and standard treatment. It should also be mentioned how many of the included patients underwent mechanical thrombectomy.

The fourth point refers to the factors that influence the outcome of VST ^[1]. The outcome of VST depends not only on age (>60 years), the presence of hemiparesis, impaired consciousness, and involvement of the transverse sinus, but also on hydration status, pro-brain natriuretic peptide (proBNP), aldosterone level, underlying etiology of VST, family history, and genetic predisposition of an individual. In a study of 82 consecutive patients with VST, female gender and the presence of focal neurological deficits were negative predictors of outcome, while the presence of gender-specific risk factors was a positive predictor of outcome ^[4].

The fifth point is that the included patients were not systematically screened for malignancy ^[1]. Table 1 of the index paper only lists that two of the included patients had a history of malignancy ^[1]. As VST can be paraneoplastic ^[5], i.e. occur before the underlying tumor is detected, it would have been imperative to screen all patients with unknown etiology of VST for occult neoplasms, as the presence of malignancy can strongly influence the outcome and therapeutic management of these patients. If the VST was paraneoplastic, the outcome may differ from the VST due to hypotension or dehydration.

The sixth point relates to the discrepancy between the methods and the results. The methods section states that patients with hemorrhagic stroke were excluded, but the results section states that 41% and 26% of patients with hemorrhagic stroke had it in the temporal and parietal lobe, respectively ^[1]. This discrepancy should be clarified.

The seventh point is that patients with jugular vein thrombosis were classified as VST ^[1]. Patients with jugular vein thrombosis should be excluded from the analysis.

In summary, this interesting study has limitations that put the results and their interpretation into perspective. Addressing these limitations could strengthen the conclusions and support the message of the study. In the search for predictors of VST outcome, all influencing factors should be considered in the multivariate analysis.

Declarations

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

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