Determination of prediction factors of post-neurosurgical thrombosis requires consideration of the entire spectrum of risk factors

ARTICLE INFO

Keywords
Thrombosis
Thromboembolism
Neurosurgery
Risk factors
Prediction factors

Letter to the Editor

We read with interest the article by Parmontree et al. about a retrospective study on the predictive factors of venous thromboembolism in patients after neurosurgical intervention [1]. The multivariant analysis revealed that non-Asian origin, lack of post-operative ambulation, and complications of septic shock were found as predictors for post-neurosurgery thrombosis [1]. The study is attractive but raises concerns that should be discussed.

A putative predictive factor for thromboembolism that was not included in the analysis is dehydration or exsiccosis. Monitoring daily fluid intake can be difficult and unreliable, particularly in patients who do not require post-operative intravenous fluids. Since dehydration is a strong risk factor of thrombosis, daily fluid intake after surgery should be included in the assessment.

Another factor that was not considered is the localisation of the neurosurgical intervention. Patients undergoing resection of a pituitary adenoma or surgery of the hypothalamus may be at risk of postoperative fluid loss due to decreased anti-diuretic hormone availability.

Although some drugs have been considered a potential risk factor of thrombosis, hormones have not been considered. In particular, women who take the pill have an increased risk of postoperative thrombosis. If these women are also smokers, the risk of thrombosis can be even higher. In addition, women who receive hormones (oestrogens) for menopausal symptoms may also be at increased risk of postoperative thrombosis.

Since patient recruitment lasted until the end 2020, it is conceivable that some of the included patients may have suffered postoperative thrombosis due to a SARS-CoV-2 infection. It is well known that SARS-CoV-2 infections are associated with an increased risk of thrombosis [2]. In some of these patients, the susceptibility to thrombosis is due to a SARS-CoV-2 infection complicated by immune thrombocytopenia [3]. We should be told how many of the included patients were positive for SARS-CoV-2.

A mechanism of thromboembolism leading to ischemic stroke that was not considered in the evaluation is patent foramen ovale (PFO). Of particular interest is if any of the 350 patients suffered an ischemic stroke after surgery.

There is also no information on how many of the included subjects had a history of atrial fibrillation. Since atrial fibrillation is a strong risk factor for ischemic stroke, accounting for about one third of the ischemic strokes [4], it is crucial to include this risk factor for thrombosis in the assessment.

Overall, the interesting study has some limitations that call the results and their interpretation into question. Clarifying these weaknesses would strengthen the conclusions and could improve the study. Several risk factors of thrombosis and thromboembolism were not considered in the evaluation. Considering these additional factors may strongly determine the outcome of patients after neurosurgery and therefore the results of the index study.

Ethical approval
n/a, letter.

Funding
No funding was received.

Author contribution
JF: design, literature search, discussion, first draft, critical comments, final approval.

Trial register number
1. Name of the registry: n/a
2. Unique Identifying number or registration ID: n/a
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): n/a
Guarantor

n/a.

Disclosures

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Compliance with ethics guidelines

This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

Consent

n/a.

Declaration of competing interest

None.

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