



Letter to the Editor

How to utilize a new pre-test probability score for diagnosis of deep vein thrombosis before surgery?



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To the editor:

Venous thromboembolism, dominantly from deep vein thrombosis (DVT), is a serious perioperative complication that is associated with mortality and morbidity [1]. We congratulate Hamamoto and colleagues, who developed a novel pre-test probability score to predict the incidence of DVT prior to major surgery [2]. Several concerns have been raised.

In this study, all participants had D-dimer $\geq 1.0 \mu\text{g/mL}^2$, which might be a potential selection bias. Applicability of their novel score to those with D-dimer $< 1.0 \mu\text{g/mL}$ might remain uncertain.

The authors used cut-offs of each item by referencing the previous studies or the upper limits of normal reference values [2]. Cut-offs that are statistically calculated for the prediction of clinical outcomes might give us greater predictability.

Approximately 25 % of the patients were excluded from their study, including those with intra-vascular devices, ongoing anticoagulants, and aneurysm [2]. We understand the reason for their exclusion: their considerable impacts on the D-dimer levels. Nevertheless, these patients should be the cohort in which we struggle to survey DVT in daily practice. Could the authors suggest to the readers any strategies to detect DVT among such a challenging cohort?

We would like to ask the authors further strategy following the calculation of their novel score. The incidence of DVT in patients who were assigned to the low risk was 6–7 % [2]. Could we ignore the estimated incidence of DVT, although not so high, and exempt those with low risk from receiving whole-leg ultrasonography?

Declaration of competing interest

None.

References

- [1] Nakamura M, Yamada N, Ito M. Current management of venous thromboembolism in Japan: current epidemiology and advances in anticoagulant therapy. *J Cardiol* 2015;66:451–9.
- [2] Hamamoto Y, Tokushige A, Toshinori Y, Ikeda Y, Horizoe Y, Yasuda H, et al. A new pre-test probability score for diagnosis of deep vein thrombosis in patients before surgery. *J Cardiol* 2022;79:664–70.

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Author's reply

We greatly appreciate the interest that Dr. Teruhiko Imamura has shown in our article “A new pretest probability score for diagnosis of deep vein thrombosis in patients before surgery” [1].

We welcome the opportunity to continue the discussion and to clarify the issues you pointed out in your letter. We will respond to each of your points point-by-point.

First, we recognized the selection bias you mentioned. As described in the “Limitations”, we conducted on pre-operative subjects with D-dimer $\geq 1.0 \mu\text{g/ml}$ for developing Kagoshima-deep vein thrombosis (DVT) score. We think that further validation evidence is needed to apply the Kagoshima-DVT score to the general population. In several facilities, we started an observational study to validate the usefulness of the Kagoshima-DVT score in pre-operative subjects included with D-dimer $< 1.0 \mu\text{g/ml}$. The validation findings will be shared at a later date.

Second, we were concerned that if a cut-off value is statistically calculated using our data set in this study, its internal validity will be improved but its outward validity would be diminished. We adopted the cut-off value set from a previous study or the upper limit of the standard reference value to apply Kagoshima-DVT score broadly at other facilities and boost external validity.

Third, as you pointed out, each of the patient groups excluded in our study affected D-dimer values, so it was difficult to predict DVT before surgery. Therefore, as Wells reported [2], we consider it is necessary to stratify the probability with the Wells score for DVT to detect symptomatic DVT.

In fact, the incidence of 6–7 % DVT is observed in the low-probability group (Kagoshima-DVT score 0–2 points). However, our study cohort consisted of pre-operative subjects with D-dimer $\geq 1 \mu\text{g/ml}$, and the prevalence of DVT was considered higher than in the pre-operative general population.