INPLASY PROTOCOL

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Support: **Yanbian University.**

Review Stage at time of this submission: **Formal screening of search results against eligibility criteria.**

Conflicts of interest:
None declared.

Risk factors for deep venous thrombosis in patients with stroke: a meta-analysis

Shi, GX[1]; Zhao, W[2].

Review question / Objective: **To identify the risk factors of deep venous thrombosis in patients with stroke.**
Condition being studied: **In the Guideline for Stroke Prevention and Control in China published in 2021, it is pointed out that stroke is one of the major diseases that endanger the national health of China, and has the characteristics of high incidence rate, high disability rate, high mortality rate, and high recurrence rate. In 2019, the incidence of ischemic stroke in China was 1,700 per 100,000 and the incidence of haemorrhagic stroke was 306 per 100,000, and the incidence of stroke in China is gradually becoming younger. DVT and PTE are known as venous thromboembolism (VTE). The resultant pulmonary embolism is also an important cause of exacerbation or early death. In practice, clinicians often neglect to assess the risk of thrombosis in hospitalized patients and often find that patients are accompanied by the presence of multiple risk factors for DVT if they suddenly develop DVT. It is therefore essential that patients with stroke should be thoroughly and systematically assessed for thrombotic risk upon admission to the hospital.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 May 2022 and was last updated on 08 May 2022 (registration number INPLASY202250045).

INTRODUCTION

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METHODS

Search strategy:

1. “Stroke"[Mesh]
2. ((((((((((((((((((((((((((Strokes[Title/Abstract]) OR (Cerebrovascular Accident[Title/Abstract])) OR (Cerebrovascular Accidents[Title/Abstract])) OR (CVA (Cerebrovascular Accident[Title/Abstract]))) OR (CVAs (Cerebrovascular Accident[Title/Abstract]))) OR (Cerebrovascular Apoplexy[Title/Abstract])) OR (Apoplexy, Cerebrovascular[Title/Abstract])) OR (Vascular Accident, Brain[Title/Abstract])) OR (Brain Vascular Accident[Title/Abstract])) OR (Brain Vascular Accidents[Title/Abstract])) OR (Vascular Accidents, Brain[Title/Abstract])) OR (Cerebrovascular Stroke[Title/Abstract])) OR (Cerebrovascular Strokes[Title/Abstract])) OR (Stroke, Cerebrovascular[Title/Abstract])) OR (Strokes, Cerebrovascular[Title/Abstract])) OR (Apoplexy[Title/Abstract])) OR (Cerebral Stroke[Title/Abstract])) OR (Cerebral Strokes[Title/Abstract])) OR (Stroke, Cerebral[Title/Abstract])) OR (Strokes, Cerebral[Title/Abstract])) OR (Stroke, Acute[Title/Abstract])) OR (Acute Stroke[Title/Abstract])) OR (Acute Strokes[Title/Abstract])) OR (Strokes, Acute[Title/Abstract])) OR (Cerebrovascular Accident, Acute[Title/Abstract])) OR (Acute Cerebrovascular Accident[Title/Abstract])) OR (Acute Cerebrovascular Accidents[Title/Abstract])) OR (Cerebrovascular Accidents, Acute[Title/Abstract])
3. ("Stroke"[Mesh]) OR ((((((((((((((((((((((((((Strokes[Title/Abstract]) OR (Cerebrovascular Accident[Title/Abstract])) OR (Cerebrovascular Accidents[Title/Abstract])) OR (CVA (Cerebrovascular Accident[Title/Abstract]))) OR (CVAs (Cerebrovascular Accident[Title/Abstract]))) OR (Cerebrovascular Apoplexy[Title/Abstract])) OR (Apoplexy, Cerebrovascular[Title/Abstract])) OR (Vascular Accident, Brain[Title/Abstract])) OR (Brain Vascular Accident[Title/Abstract])) OR (Brain Vascular Accidents[Title/Abstract])) OR (Vascular Accidents, Brain[Title/Abstract])) OR (Cerebrovascular Stroke[Title/Abstract])) OR (Cerebrovascular Strokes[Title/Abstract])) OR (Stroke, Cerebrovascular[Title/Abstract])) OR (Strokes, Cerebrovascular[Title/Abstract])) OR (Apoplexy[Title/Abstract])) OR (Cerebral Stroke[Title/Abstract])) OR (Cerebral Strokes[Title/Abstract])) OR (Stroke, Cerebral[Title/Abstract])) OR (Strokes, Cerebral[Title/Abstract])) OR (Stroke, Acute[Title/Abstract])) OR (Acute Stroke[Title/Abstract])) OR (Acute Strokes[Title/Abstract])) OR (Strokes, Acute[Title/Abstract])) OR (Cerebrovascular Accident, Acute[Title/Abstract])) OR (Acute Cerebrovascular Accident[Title/Abstract])) OR (Acute Cerebrovascular Accidents[Title/Abstract])) OR (Cerebrovascular Accidents, Acute[Title/Abstract])
4. "Venous Thrombosis”[Mesh]
5. ((((((((((((((((((((((((Phlebothrombosis[Title/Abstract]) OR (Phlebothromboses[Title/Abstract])) OR (Thrombosis, Venous[Title/Abstract])) OR (Thromboses, Venous[Title/Abstract])) OR (Venous Thromboses[Title/Abstract])) OR (Deep Vein Thrombosis[Title/Abstract])) OR (Deep Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep Vein[Title/Abstract])) OR (Vein Thromboses, Deep[Title/Abstract])) OR (Vein Thrombosis, Deep[Title/Abstract])) OR (Deep-Venous Thrombosis[Title/Abstract])) OR (Deep-Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep-Venous[Title/Abstract])) OR (Thrombosis, Deep-

Venous[Title/Abstract])) OR (Deep-Vein Thrombosis[Title/Abstract])) OR (Deep-Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep Vein[Title/Abstract])) OR (Deep Venous Thrombosis[Title/Abstract])) OR (Deep Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep Venous[Title/Abstract])) OR (Thrombosis, Deep Venous[Title/Abstract])) OR (Venous Thromboses, Deep[Title/Abstract])) OR (Venous Thrombosis, Deep[Title/Abstract])

6. ("Venous Thrombosis"[Mesh]) OR ((((((((((((((((((((((((Phlebothrombosis[Title/Abstract]) OR (Phlebothromboses[Title/Abstract])) OR (Thrombosis, Venous[Title/Abstract])) OR (Thromboses, Venous[Title/Abstract])) OR (Venous Thromboses[Title/Abstract])) OR (Deep Vein Thrombosis[Title/Abstract])) OR (Deep Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep Vein[Title/Abstract])) OR (Vein Thromboses, Deep[Title/Abstract])) OR (Vein Thrombosis, Deep[Title/Abstract])) OR (Deep-Venous Thrombosis[Title/Abstract])) OR (Deep-Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep-Venous[Title/Abstract])) OR (Thrombosis, Deep-Venous[Title/Abstract])) OR (Deep-Vein Thrombosis[Title/Abstract])) OR (Deep-Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep Vein[Title/Abstract])) OR (Deep Venous Thrombosis[Title/Abstract])) OR (Deep Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep Venous[Title/Abstract])) OR (Thrombosis, Deep Venous[Title/Abstract])) OR (Venous Thromboses, Deep[Title/Abstract])) OR (Venous Thrombosis, Deep[Title/Abstract]))

7. (relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND stud*[Title/Abstract])

8. ((("Stroke"[Mesh]) OR ((((((((((((((((((((((((Strokes[Title/Abstract]) OR (Cerebrovascular Accident[Title/Abstract])) OR (Cerebrovascular Accidents[Title/Abstract])) OR (CVA (Cerebrovascular Accident[Title/Abstract]))) OR (CVAs (Cerebrovascular Accident[Title/Abstract]))) OR (Cerebrovascular Apoplexy[Title/Abstract])) OR (Apoplexy, Cerebrovascular[Title/Abstract])) OR (Vascular Accident, Brain[Title/Abstract])) OR (Brain Vascular Accident[Title/Abstract])) OR (Brain Vascular Accidents[Title/Abstract])) OR (Vascular Accidents, Brain[Title/Abstract])) OR (Cerebrovascular Stroke[Title/Abstract])) OR (Cerebrovascular Strokes[Title/Abstract])) OR (Stroke, Cerebrovascular[Title/Abstract])) OR (Strokes, Cerebrovascular[Title/Abstract])) OR (Apoplexy[Title/Abstract])) OR (Cerebral Stroke[Title/Abstract])) OR (Cerebral Strokes[Title/Abstract])) OR (Stroke, Cerebral[Title/Abstract])) OR (Strokes, Cerebral[Title/Abstract])) OR (Stroke, Acute[Title/Abstract])) OR (Acute Stroke[Title/Abstract])) OR (Acute Strokes[Title/Abstract])) OR (Strokes, Acute[Title/Abstract])) OR (Cerebrovascular Accident, Acute[Title/Abstract])) OR (Acute Cerebrovascular Accident[Title/Abstract])) OR (Acute Cerebrovascular Accidents[Title/Abstract])) OR (Cerebrovascular Accidents, Acute[Title/Abstract]))) AND (("Venous Thrombosis"[Mesh]) OR ((((((((((((((((((((((((Phlebothrombosis[Title/Abstract]) OR (Phlebothromboses[Title/Abstract])) OR (Thrombosis, Venous[Title/Abstract])) OR (Thromboses, Venous[Title/Abstract])) OR (Venous Thromboses[Title/Abstract])) OR (Deep Vein Thrombosis[Title/Abstract])) OR (Deep Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep Vein[Title/Abstract])) OR (Vein Thromboses, Deep[Title/Abstract])) OR (Vein Thrombosis, Deep[Title/Abstract])) OR (Deep-Venous Thrombosis[Title/Abstract])) OR (Deep-Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep-Venous[Title/Abstract])) OR (Thrombosis, Deep-Venous[Title/Abstract])) OR (Deep-Vein Thrombosis[Title/Abstract])) OR (Deep-Vein Thromboses[Title/Abstract])) OR (Thromboses, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep-Vein[Title/Abstract])) OR (Thrombosis, Deep Vein[Title/Abstract])) OR (Deep Venous

Thrombosis[Title/Abstract])) OR (Deep Venous Thromboses[Title/Abstract])) OR (Thromboses, Deep Venous[Title/Abstract])) OR (Thrombosis, Deep Venous[Title/Abstract])) OR (Venous Thromboses, Deep[Title/Abstract])) OR (Venous Thrombosis, Deep[Title/Abstract]))))) AND ((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word]) OR risks[Text Word] OR cohort studies[MeSH:noexp] OR (cohort[Title/Abstract] AND stud*[Title/Abstract])).

Participant or population: Patients with stroke.

Intervention: Stroke patients with DVT.

Comparator: Stroke patients without DVT.

Study designs to be included: Cohort study or case-control study.

Eligibility criteria: Inclusion criteria: (i) the study population was stroke patients (age ≥18 years) who met the revised diagnostic criteria of the 4th National Conference on Cerebrovascular Diseases [22] or WHO diagnostic criteria [23] and were confirmed by CT/MRI; tumour stroke, transient ischaemic attack and cerebral venous system thrombosis were excluded; (ii) the outcome met the diagnostic criteria for deep vein thrombosis [24] and was confirmed by compression ultrasound or colour Doppler ultrasound; (iii) the study type was a cohort study or case-control study; (iv) the language of the restricted literature was English. Doppler ultrasonography; (iii) the type of study was a cohort study or case-control study; (iv) the language of the restricted literature was English and Chinese.Exclusion criteria: (i) duplicate publications; (ii) studies with no full text, incomplete information or inability to perform data extraction; (iii) definition of exposure differing significantly from the majority of the literature; ○4 reviews, conferences, abstracts, case reports, etc.

Information sources: We searched Electronic databases: Cochrane Library, PubMed, Embase, Web of Science, ProQuest, China National Knowledge Infrastructure(CNKI), VIP database, Wanfang database, and China Biomedical Literature Database (CBM). The search period was from the date of database creation to 24 April 2022.

Main outcome(s): Identifying the risk factors of DVT in stroke and establishing a clinically applicable prediction model.

Data management: Noteexpress.

Quality assessment / Risk of bias analysis: Two researchers independently used NOS to evaluate the quality of the literature, and any disagreements were resolved through consultation or third-party opinion. NOS includes 4 items (4 points) for "selection", 1 item (2 points) for "comparability" and 3 items (3 points) for "outcome" or “exposure” with a full score of 9 points. The Articles with NOS score ≥6 was classified as high quality literature and <6 was considered low-quality articles.

Strategy of data synthesis: Data were analyzed using RevMan 5.4. For enumeration data, the odds ratio (OR) was used as the effective index, the mean difference (MD) was selected for continuous variables, and the interval estimation was expressed by a 95% confidence interval (95% CI). If the heterogeneity test P≥0.1, I2≤50%, it indicates the homogeneity among the studies, and the fixed effect model is used for combined analysis; If the heterogeneity is still large, a random effect model is used or the results are discarded and combined, and descriptive analysis is used. When more than 10 articles were included in the analysis of a single risk factor, a funnel plot was used to analyze the publication bias of each risk factor.

Subgroup analysis: If there is significant heterogeneity in the included trials, a subgroup analysis will be performed based on potential factors such as the underlying disease or age of patients with stroke to explore possible factors for heterogeneity.

Sensitivity analysis: A sensitivity analysis will be performed to test the robustness of the review result and to detect the source of heterogeneity This can be done by excluding trials with a high risk of bias or eliminating each study individually.

Language: Chinese and English.

Country(ies) involved: China.

Keywords: stroke; deep venous thrombosis; risk factors; meta-analysis.

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