

Prevalence of and Risk Factors for Venous Thromboembolism in Patients With Lymphoma: A Meta-Analysis

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PROBLEM IDENTIFICATION: The risk of venous thromboembolism (VTE) in patients with lymphoma may be overlooked because patients often experience thrombocytopenia from the disease or chemotherapy. A meta-analysis was conducted to identify the prevalence of and risk factors for VTE in patients with lymphoma.

LITERATURE SEARCH: A systematic search of Embase®, Web of Science, PubMed®, and Cochrane Library databases was conducted to identify relevant studies investigating VTE in patients with lymphoma.

DATA EVALUATION: The methodologic quality of the eligible observational studies was assessed using the Newcastle-Ottawa Scale. Stata, version 12.0, was used to perform the meta-analysis.

SYNTHESIS: Female sex, older age, history of VTE, a diagnosis of diffuse large B-cell lymphoma, Ann Arbor stage III–IV disease, a higher performance status score, bulky disease, central nervous system involvement, a white blood cell count greater than $11 \times 10^9/L$, a D-dimer level greater than 0.5 mg/L, central venous catheterization, and treatment with doxorubicin were significant risk factors for VTE.

IMPLICATIONS FOR PRACTICE: This meta-analysis identified risk factors for VTE, which may provide a theoretical foundation for clinical staff to conduct early assessment and identification of high-risk VTE groups, allowing for timely intervention.

KEYWORDS venous thromboembolism; lymphoma; risk factors; assessment; meta-analysis

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Venous thromboembolism (VTE), which consists of deep venous thrombosis and pulmonary embolism, is a significant global burden and ranks as the third leading cause of death worldwide (Klemen et al., 2020). Lymphoma is a malignancy that carries a high risk of VTE, with an incidence ranging from 5.3% to 59.5% (Caruso et al., 2010; Goldschmidt et al., 2003). VTE in patients with lymphoma is associated with prolonged hospitalization, bleeding-related complications, and mortality, all of which can severely affect prognosis (Kirkizlar et al., 2020). Therefore, it is crucial to determine the prevalence of VTE, identify risk factors in a timely manner, and implement targeted preventive measures to reduce the occurrence of VTE in patients with lymphoma.

VTE incidence across different lymphoma subtypes varies alongside tumor characteristics, such as metastatic spread and growth rate. In a meta-analysis of 18 published studies (Caruso et al., 2010), the prevalence of VTE in patients with non-Hodgkin lymphoma (NHL) was 6.5%, which was significantly higher than the 4.7% prevalence rate observed in patients with Hodgkin lymphoma (HL). An incidence rate of 10%–12% has been reported in patients with aggressive histology, including diffuse large B-cell lymphoma (DLBCL) (Hohaus et al., 2018), and in patients with primary central nervous system lymphoma, the incidence rate is as high as 31% (Saito et al., 2021). Because of its high incidence rate, it is important to identify risk factors associated with VTE to ensure early prevention. Therefore, routine assessment of the risk of VTE in patients with newly diagnosed lymphoma is recommended.

Numerous studies have examined risk factors associated with VTE in patients with lymphoma, with inconsistent results. Previous studies (Borg et al., 2016; Chen et al., 2022) have suggested that age,