Risk Factors Of Symptomatic Venous Thromboembolism In Sarcoma Patients: A Japanese Prospective Multicenter Study

Introduction: Patients with musculoskeletal tumors may have a higher risk of venous thromboembolism (VTE) because of vessel wall injury during surgery, venous stasis caused by immobilization after surgery, and activation of coagulation factors in malignant disease. However, no prospective studies have been undergone to prove this theory. The aim of this prospective multicenter study was to evaluate an incidence and risk factors of symptomatic VTE in Japanese musculoskeletal sarcoma patients.

Methods: VTE cohort study for sarcoma (VTECS) is a prospective observational cohort study of patients with newly diagnosed bone and soft tissue sarcoma and planned for definitive surgery. Patients with metastatic tumor or benign/intermediate bone and soft tissue tumor, or past history of VTE were excluded from this study. Thirty tertiary musculoskeletal oncology hospitals belonging to Japanese Musculoskeletal Oncology Group (JMOG) participated in this study from April 2012 to March 2015. The endpoints of this study were incidence of symptomatic VTE within the follow-up of 6 months and risk factors of symptomatic VTE. Univariate (Wilcoxon rank sum test or chi-square test) and multivariate (logistic regression model) analysis were used to analyze the association of the incidence of symptomatic VTE and risk factors.

Results: Eight out of 803 patients were diagnosed as a symptomatic VTEs (7 deep venous thromboses and 1 pulmonary embolism) on 7 to 53 days after the surgery (median, 12 days), and the incidence was 1.0%. All clinically detected symptomatic VTEs were confirmed by CT venography or ultrasonography. Univariate analysis indicated that lower extremity (P=.042), maximum diameter over 6cm (P=.032), elevation of preoperative platelet count (P=.023), operation time longer than 5 hours (P=.026), and blood loss during surgery over 700mL (P<.0001) were significantly associated with the occurrence of symptomatic VTE, although age at diagnosis of VTE (median, 56 years old), gender (3 males and 5 females), and body mass index (median, 21.2) did not. Multivariate analysis resulted that the elevation of preoperative platelet count (relative risk, 6.59) and massive blood loss (relative risk, 9.57) were independent risk factors of increased risk of symptomatic VTE.

Conclusion: The incidence of symptomatic VTE in Japanese patients with bone and soft tissue sarcoma was 1.0%. Elevation of preoperative platelet count and massive blood loss during the surgery are new risk factors for occurrence of symptomatic VTE in those patients.

Keywords : VTE, Sarcoma, Risk factor

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