Abstract:

PURPOSE: Venous pain induced by peripheral intravenous infusion of gemcitabine has remained an unresolved issue in clinical practice. This study aimed to identify differences between gemcitabine formulations as well as risk factors associated with gemcitabine-induced venous pain in patients with cancer.

METHODS: We retrospectively analyzed data from consecutive patients with cancer who had received chemotherapy including a lyophilized or liquid formulation of gemcitabine diluted with 5% glucose solution via a peripheral vein. The study was conducted at Ehime University Hospital using electronic medical records dated between January 2015 and July 2017. The primary end point was the prevalence of venous pain at the administration site during gemcitabine infusion, classified as injection site reaction of grade ≥2 according to the Common Terminology Criteria for Adverse Events, version 4.0. A multivariate logistic regression analysis with generalized estimating equations for longitudinal data was used to identify risk factors for venous pain during all courses of gemcitabine treatment.

FINDINGS: A total of 1150 treatment courses in 141 Japanese patients were evaluated in this study. Venous pain occurred in 115 courses (10.0%) and in 49 patients (34.8%). The multivariate logistic regression analysis with generalized estimating equations revealed that a dose increase of gemcitabine and use of the liquid formulation of gemcitabine were significantly associated with an increased risk for venous pain (dose increase, adjusted odds ratio (OR) = 1.25; 95% CI, 1.11-1.40 (P < 0.001); and liquid formulation, adjusted OR = 12.43, 95% CI, 5.61-27.51 (P < 0.001)), whereas age, course number of gemcitabine, and use of the soft-back product of 5% glucose solution were significantly associated with a reduced risk for venous pain (age, adjusted OR = 0.75; 95% CI, 0.57-0.98; course number, adjusted OR = 0.96; 95% CI, 0.92-0.99 (P = 0.023); and soft back, adjusted OR = 0.39; 95% CI, 0.21-0.74 (P = 0.004)).

IMPLICATIONS: The use of the liquid formulation of gemcitabine was associated with a significant increase in the frequency of gemcitabine-induced venous pain despite dilution with 5% glucose solution compared to that with the lyophilized formulation. The lyophilized formulation of gemcitabine should hence be used in peripheral intravenous infusion for the treatment of patients with cancer.

Reference: