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PAI-1 4G/5G polymorphism and risks of peripherally inserted central catheter-related upper extremity venous thrombosis in lung cancer patients

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Objective: The association of PAI-1 promoter 4G/5G gene polymorphism with peripherally inserted central catheter related upper extremity venous thrombosis (PICC-UEVT) is still not well defined. We explore the relationship between PAI-1 promoter 4G/5G gene polymorphism and PICC-UEVT in Chinese lung cancer patients. The clinical factors associated with PICC-UEVT is also analyzed.

Methods: A total of 237 lung cancer patients were included. Blood samples were collected to detect the PAI-1 genotype, Caprini risk model was used after the catheterization of a PICC. Color Doppler ultrasound were performed after 48 hours to inspect whether catheter related venous thrombosis was formed, and then patients received ultrasound again on the 7th, 14th, 21st days.

Results: The incidence of PICC-UEVT was 13.50% and the median occurrence time was 5.00 (3.00-7.25) days. There were three genotypes of PAI-1 promoter, and the distribution frequencies of three genotypes in thrombosis group and non-thrombus group were: 4G/4G type (28.12%:34.17%), 4G/5G type (59.38%:49.27%), 5G/5G type (12.50%:17.56%), and the genotype distribution frequency had no significant difference ($P>0.05$). The median Caprini risk scores of thrombosis group was 6.16 ± 1.32 while the non-thrombus group was 5.66 ± 0.87 , the difference was statistically significant ($P=0.049$). The logistic regressive analysis showed that patients with higher Caprini risk scores and FIB are risks for the PICC-UEVT. And the risk of PICC-UEVT increases with the paclitaxel cisplatin (TP) (OR=18.332, 95%CI: 2.890-116.278) and gemcitabine cisplatin (GP) (OR=6.617, 95%CI: 1.210-36.180) regimen compared to those with pemetrexed cisplatin (AP) regimen.

Conclusion: Medical staff should attach great importance to the occurrence of venous thrombosis within one week after PICC catheterization as well as patients at high risk according to Caprini risk scores, FIB and take preventive measures actively.