The usefulness of dipyridamole thallium-201 single photon emission computed tomography for predicting perioperative cardiac events in patients undergoing non-cardiac vascular surgery

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The aim of this study was to evaluate the usefulness of dipyridamole Tl-201 myocardium single photon emission computed tomography (^{201}Tl-SPECT) for predicting perioperative cardiac events in patients with arteriosclerosis obliterans (ASO) and abdominal aortic aneurysm (AAA) undergoing non-cardiac vascular surgery. *Methods:* Preoperative dipyridamole ^{201}Tl-SPECT imaging in association with clinical risk assessment was performed in 224 consecutive patients (97 ASO and 127 AAA). *Results:* The patients were classified into three groups, including low-risk (n = 173, 77%), intermediate-risk (n = 39, 18%), and high-risk (n = 12, 5%) groups according to the clinical risk stratification. The prevalence of reversible Tl-201 defect was significantly higher in the high-risk group than that in the low-risk group (83% vs. 14%, $p < 0.001$). In 180 patients who underwent vascular surgery, 9 patients (5.0%) had perioperative cardiac events, including heart failure (n = 1), unstable angina (n = 2), and other cardiac events such as arrhythmias (n = 6). The clinical variables including the clinical risk stratification did not significantly correlate with the perioperative cardiac events. In contrast, the reversible defect on ^{201}Tl-SPECT was the only variable to predict perioperative cardiac events by a stepwise logistic regression analysis (odds ratio 7.0, 95% confidence interval 1.7–28.0, $p = 0.007$). It was also a significant predictor of perioperative cardiac events in a subgroup of low risk patients (odds ratio 11.6, 95% confidence interval 2.3–57.4, $p = 0.004$). The sensitivity and specificity of the reversible defect for predicting perioperative cardiac events were 55.6% and 84.8% in all operated patients, and 57.1% and 89.7% in low risk patients, respectively. *Conclusions:* The preoperative dipyridamole ^{201}Tl-SPECT was useful for predicting perioperative cardiac events in patients with vascular diseases, even in patients identified as having a low risk based on the clinical risk assessment.

Key words: dipyridamole, Tl-201, SPECT, perioperative cardiac event, vascular diseases