OPTIMAL CUT-OFF VALUE OF TC-99M DTPA AND TC-99M MAG3 PERFUSION INDEX FOR DETECTION OF ACUTE RENAL GRAFT REJECTION

Nattha Sihanoo¹, Charoonsak Somboonporn¹, Daris Theerakulpisut¹, Pantipa Tonsawan²

¹Department of Radiology, ²Department of Medicine, Faculty of Medicine, KhonKaen University, KhonKaen 40002, Thailand

Abstract

Acute renal graft rejection is one of serious complication after transplantation which could be definitely diagnosed by biopsy. In the renal scintigraphy, the perfusion index has been known to be the indicator for diagnosis of rejection. However, the optimal cut-off value of this index is found to be inconclusive. The aim of this study is to determine the optimal cut-off value of Tc-99m DTPA and Tc-99m MAG3 perfusion index for detection of acute renal graft rejection.

Materials and methods: This study is a retrospective analytical observational study. The renal transplant recipients who were evaluated their post-transplant graft function by the renal scintigraphy, performed in the Nuclear Medicine Department, Srinagarind Hospital, were included into this study. All of them underwent the kidney biopsy within two weeks after transplantation. The patients with non-bolus radiopharmaceutical injection were excluded from the study before assessing their renal scintigraphy.

Results: There are fifty renal transplant recipients included into the study. Three patients were excluded because of non-bolus radiopharmaceutical injection and one patient was excluded because of incomplete first minute data collection (the perfusion phase). Consequently, 46 patients were included for analysis and were divided into two groups according to biopsy diagnosis. The first is acute rejection group (41 patients) and the second is non-rejection group (5 patients). The perfusion index of acute rejection group is found to be higher than that of the non-rejection group. The mean of perfusion index of Tc-99m DTPA in acute rejection and non-rejection group is 160.5 and 121.2, respectively, while that of Tc-99m MAG3 in acute rejection and non-rejection group is 117.1 and 114.9, respectively. The perfusion index is not statistically significant different between acute rejection group and non-rejection group. However, the perfusion index of Tc-99m DTPA is found to be correlated with that of Tc-99m MAG3. The cut-off value of perfusion index of 126 and 100 for Tc-99m DTPA and Tc-99m MAG3, respectively, can detect acute renal graft rejection with the sensitivity and specificity of approximately 60%.

Conclusion: The perfusion index of Tc-99m DTPA and Tc-99m MAG3 may not be the sensitive and specific indicator for detecting acute graft rejection.

Keyword: Acute renal graft rejection/ Hilson’s perfusion index/ Tc-99m DTPA/ Tc-99m MAG3