

Study on the usefulness of whole body SPECT coronal image, MIP image in ^{67}Ga scintigraphy

Seiji KAWAMURA,* Masatoshi ISHIBASHI,** Shigehiro FUKUSHIMA,*** Seiji KURATA,**
Noriyoshi UMEZAKI,**** Seiichirou MORITA** and Naofumi HAYABUCHI**

**Center for Diagnostic Imaging, Kurume University Hospital*

***Department of Radiology, Kurume University School of Medicine*

****Auditory and Visual Communication Sciences Graduate School Kyushu Institute of Design*

*****Department of Radiochemistry & Radiation Hygiene Daiichi College of Pharmaceutical Sciences*

In this study, we examined the usefulness of whole body coronal images and whole body cine display MIP images (CMIP) upon which image processing was carried out after whole body SPECT in comparison to the usefulness of whole body images (WB/SC) compensated by scattered radiation in tumor/inflammation scintigraphy with ^{67}Ga -citrate (^{67}Ga). Image interpretation was performed for the 120 patients with confirmed diagnoses, and the accuracy of their diagnoses was studied by three nuclear medical physicians and two clinical radiological technologists by means of sensitivity, specificity and ROC analysis. The resultant data show that sensitivity, specificity, accuracy and the area under the ROC curve Az in the WB/SC were approximately 65%, 86%, 74% and 0.724, respectively, whereas sensitivity, specificity, accuracy and Az of the image reading system in which CMIP is combined with whole body coronal images reconstructed by the OS-EM method were approximately 93%, 95%, 94% and 0.860, respectively. Furthermore, coronal images reconstructed by the OS-EM method tended to be superior to those produced by the FBP method in both diagnostic accuracy and ROC analysis. In conclusion, the image reading system in which CMIP is combined with whole body coronal images reconstructed by the OS-EM method was shown to be superior in diagnostic accuracy and ROC analysis. Our data suggest that whole body SPECT is an excellent technique as an alternative to WB/SC.

Key words: whole body SPECT, ^{67}Ga -citrate, ordered subset expectation maximization (OS-EM), filtered back projection (FBP), maximum intensity projection (MIP)