EDITORIAL POINT OF VIEW

Current Clinical Practice of Nuclear Cardiology in Japan

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Abstract

For the numerous cardiology clinical practices in Japan, nuclear cardiology imaging tests are among the most important diagnostic tools. The Japanese nuclear cardiology community has developed a new application using $^{18}$F-fluorodeoxyglucose (FDG) positron emission tomography (PET) to diagnose cardiac sarcoidosis, as well as new diagnostic imaging tests using $^{123}$I-beta-methyl-p-iodophenyl-pentadecanoic acid (BMIPP) and $^{123}$I-metaiodobenzylguanidine (MIBG). These new approaches have become popular worldwide. The Japanese Circulation Society (JCS) and the Japanese Society of Nuclear Cardiology (JSNC) have published clinical imaging guidelines and recommendations showing indications and standards for the new imaging tests. Current nuclear cardiology clinical practices in Japan may provide new insights for nuclear cardiology worldwide.

Keywords: Approval, Guidelines, Japanese Ministry of Health, Labor, and Welfare, Myocardial perfusion imaging, Positron emission tomography

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Based on the Japanese ISOTOPE Foundation survey, 1,170 facilities performed nuclear medicine tests in 2012. The population of Japan is currently 125 million, with 0.94 nuclear facilities per 100,000 population. Twenty-five percent of those facilities (296 of 1,170) performed PET studies. Among them, 104 performed PET only, and the remaining 192 performed both PET and SPECT (1,2).

Nuclear cardiology practice in Japan

The 2012 Japanese ISOTOPE Foundation survey showed the total number of nuclear cardiology studies performed as 31,475, an 11.0% decrease compared to the number in the previous survey in 2007. The Japanese Circulation Society (JCS) also conducts a clinical practice survey known as the Japanese Registry Of All cardiac and vascular Disease (JROAD) every year. Results of this survey also show a decreasing trend in the use of single-photon emission computed tomography (SPECT) myocardial perfusion imaging (MPI). In contrast, the overall numbers of PET studies are gradually increasing, possibly indicating that PET is gradually replacing conventional SPECT MPI, similar to the case in North America (3).

Ministry’s approval of nuclear cardiology in Japan

Almost all members of the Japanese population are covered by either governmental or company health insurance plans. Health insurance covers 70% of hospital visits, in-patient treatment, and drugs. In this regard, it is quite important to obtain Japanese Ministry of Health, Labor, and Welfare (JMHLW) approval and reimbursement for new diagnostic imaging tests. JMHLW has approved 3 MPI and two I-123 imaging tracers for SPECT (Table 1) (4). JMHLW currently approves $^{15}$N-ammonia ($\text{NH}_3$) for MPI, $^{15}$O-labeled gas for radionuclide angiography, and $^{18}$F-fluorodeoxyglucose (FDG) for myocardial viability and cardiac sarcoidosis testing (Table 1) (2,5). Unlike the earlier approval of SPECT imaging, in the case of PET imaging, JMHLW approval was contingent upon some conditions. Currently standard hybrid PET/computed tomography (CT) scanners use CT for attenuation correction. However, for cardiac PET, only the PET part is reimbursed even when a PET/CT scanner is used, and the simultaneously performed CT study is not reimbursed. $^{15}$N-$\text{NH}_3$ PET MPI is
Japanese Circulation Society guidelines for nuclear cardiology and Japanese Society of Nuclear Cardiology recommendation

JCS guidelines, initially issued in 1989, provided clinical indications for nuclear cardiology. The current JCS guidelines were updated in 2010 (7). In accordance with JMHLW approval, the JCS guidelines include indications for the clinical use of $^{123}$I-BMIPP and $^{123}$I-MIBG (Table 2).

In 2014, the Heart Rhythm Society (HRS) issued an expert statement on the diagnosis of cardiac involvement of sarcoidosis, in which it raised the importance of $^{18}$F-FDG PET imaging for that purpose (8). However, previous to that, no clinical standard for $^{18}$F-FDG PET in sarcoidosis patients existed. In this regard, the Japanese Society of Nuclear Cardiology (JSNC) established a subcommittee and issued the recommendation that $^{18}$F-FDG PET imaging be used for detecting cardiac sarcoidosis (6).

Conclusions

Current nuclear cardiology practice in Japan resembles that in North America but specifically differs in that $^{123}$I-tracers imaging and $^{18}$F-FDG PET have been approved for the diagnosis of cardiac sarcoidosis, differences that may be worthy of consideration for nuclear cardiology practice worldwide.

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Conflicts of interest

None

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