JSNC YOUNG INVESTIGATOR AWARD－REVIEW ARTICLE

Recent Research Topics in Nuclear Cardiology from the YIA Session of JSNC 2015

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Received: May 30, 2016/Revised manuscript received: July 8, 2016/Accepted: July 12, 2016

Abstract

The Young Investigator Award (YIA) competition session is one of the highlights of the Japanese Society of Nuclear Cardiology (JSNC) annual scientific meeting. Beginning in 2014, the top 3 abstracts submitted to the JSNC annual meeting by candidates under the age of 40 have been considered for the YIA. At the 2015 YIA session, these candidates presented abstracts on the latest important research topics in nuclear cardiology. These topics included phase analysis in chronic kidney disease, cardiac sarcoidosis, and risk assessment using myocardial perfusion imaging.

Keywords: Award, Gated SPECT, Japanese Society of Nuclear Cardiology, Myocardial perfusion imaging, Sarcoidosis

Ann Nucl Cardiol 2016；2（1）：186-187

The Japanese Society of Nuclear Cardiology (JSNC) has given Young Investigator Awards (YIA) to researchers under age 40 since 2000 to encourage young physicians and scientists in their nuclear cardiology research activities (1). YIA candidates presented their research topics at the 2015 JSNC YIA session. In this review, we will report on the latest research topics from that session.

Latest research topics in nuclear cardiology and cardiac imaging

Risk stratification using stress myocardial perfusion single-photon emission computed tomography (SPECT) is more common than previously thought. Summed stress score (SSS), which combines the size of myocardial infarction and the amount of stress-induced ischemia is clinically useful information for risk stratifications (2). Conversely, anatomical assessment using SYNTAX score is frequently used in decision-making regarding coronary interventions (percutaneous coronary interventions or coronary artery bypass grafting) (3).

Hori et al. investigated the prognostic value of SSS and SYNTAX score in patients who had revascularization. They evaluated cardiovascular events in 412 patients who underwent rest ^{201}Thallium (Tl) /stress ^{99m}Tc-tetrofosmin SPECT myocardial perfusion imaging (MPI) and had revascularization. There were 37 hard cardiac events including 11 cardiac deaths, one non-fatal myocardial infarction and 25 instances of unstable angina. Patients with SYNTAX score ≥13 and SSS< 9 showed higher cardiovascular event ratio than did those with SYNTAX score <13 and SSS ≥9 (5.8% vs. 2.1%, P<0.05).

A previous report by Kiriyama et al. also addressed the usefulness of combining assessments. They examined coronary calcium score (CCS) and stress myocardial perfusion SPECT to prevent the underestimation of 3-vessel disease or left main coronary artery disease (4). Using such multimodality assessments would contribute to reducing unnecessary interventions and would improve patient care.

Mori and colleagues investigated phase analysis in patients with normal myocardial perfusion and chronic kidney disease (CKD). They used phase standard deviation (PSD) and 95% bandwidth (BW) in stress ECG-gated images. The group with high PSD and wide BW showed higher cardiac event rates including cardiac death, fatal arrhythmia and remote coronary interventions than did the group with low PSD and narrow BW. They found that mechanical dyssynchrony affected the prognosis of patients with CKD regardless of normal

doi：10.17996/ANC.02.01.186

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myocardial perfusion. They concluded that phase analysis would be a useful prognostic marker in this specific population. Previously, data on standard normal values of phase analysis in Japanese population did not exist. Four ECG-gated programs are currently available to analyze those parameters. Recently, Nakajima et al. as part of a Japanese Society of Nuclear Medicine (JSNM) working group documented normal values and standardization of parameters in Japanese population (5). The JSNM working group considered the Emory Cardiac Toolbox, quantitative gated SPECT program (QGS), Heart Function View, and cardio REPO (cREPO) as standard approaches. The data presented by Mori et al. may add new risk assessment markers for this challenging population.

The JSNC subcommittee issued guidelines for diagnosing cardiac sarcoidosis using ^{18}F-fluorodeoxyglucose PET (^{18}F-FDG) (6). JSNC members have done extensive development of diagnostic approaches for patients with cardiac involvement of sarcoidosis (7). According to JSNC guidelines, the standard diagnostic approach is visual analysis of ^{18}F-FDG PET. Ideally, more reliable and quantitative approaches should be developed. In this regard, Yokoyama et al. applied the maximum standardized uptake value (SUVmax), a marker of ^{18}F-FDG uptake, to detect cardiac involvement of sarcoidosis. Patients with cardiac involvement of sarcoidosis showed elevated SUVmax values, and therefore, SUVmax may have potential as a diagnostic marker in cardiac sarcoidosis (8). As the next step, it would be important to evaluate whether this semi-quantitative approach has additional diagnostic value over standard visual analysis.

Conclusions

Topics presented in the JSNC YIA competition included risk assessment using MPI, phase analysis, and cardiac sarcoidosis. These 3 presentations reflected current research topics. The next YIA session is certain to provide JSNC members with additional information on the latest significant research topics.

Acknowledgments

This manuscript has been reviewed by a North American English-language professional editor, Ms. Holly Beanlands. The authors also thank Ms. Holly Beanlands for critical reading of the manuscript.

Sources of funding

None

Conflicts of interest

None

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