

JSNC AWARD

Introduction of the JSNC Award – Scope and Recent Research Topics from JSNC Award Memorial Lectures –

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Abstract

In each year, Japanese Society of Nuclear Cardiology (JSNC) recognizes and rewards an outstanding investigator who is making great contributions to the advancement of nuclear cardiology. Until 2015, sixteen researchers have received the JSNC award. In the award presentation session in the annual JSNC scientific meeting, the audience can encounter the latest and outstanding research achievements in the field of nuclear cardiology. This article provides JSNC members with key research topics covered in recent-3 year JSNC award, including coronary flow reserve assessment using positron emission tomography, assessment of myocardial dysfunction with ^{99m}Tc technetium sestamibi imaging, and prognostic values of ^{123}I -metaiodobenzylguanidine imaging.

Keywords: Award, Japanese Society of Nuclear Cardiology, Coronary flow reserve, ^{99m}Tc Technetium sestamibi, ^{123}I -metaiodobenzylguanidine

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Japanese Society of Nuclear Cardiology (JSNC) has a mission to promote nuclear cardiology research activities in Japan. JSNC award is annually given to an outstanding investigator who is making major contributions to the advancement of nuclear cardiology. The JSNC award winner presents the distinguished achievements in each year JSNC scientific meeting, and the audience can encounter the highly-organized and up-to-date research in the presentation, which should meet the aim of JSNC. Therefore, the award session is one of the biggest highlights in the JSNC annual conference. In this article, we provide the key research topics, which the recent JSNC award winners have investigated, and to encourage the up-and-coming researchers to apply for the JSNC award.

Recent key research topics of the JSNC award

Coronary flow reserve (CFR) is a measure of

coronary vasomotor dysfunction that integrates the hemodynamic effects of epicardial coronary stenosis, diffuse atherosclerosis, and microvascular dysfunction on myocardium (1). The 23rd JSNC award was given to Masanao Naya (Hokkaido University) for his work on CFR assessment with myocardial perfusion positron emission tomography (PET). Naya and his colleagues evaluated the interrelation of CFR measured by ^{82}Rb myocardial perfusion PET and coronary artery calcium (CAC), with respect to the prediction of clinical outcomes, in 901 patients with suspected coronary artery disease (CAD) (2). Annual risk-adjusted major adverse cardiac event (MACE) rates were higher for the patients with CFR <2.0 compared with ≥ 2.0 (1.9 vs. 5.5% year, $p=0.0007$) but were only borderline associated with CAC (3.1%, 3.4%, and 6.2% year for CAC of 0, 1 to 399, and ≥ 400) (2). Annualized adjusted MACE was increased in the presence of impaired CFR

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even among patients with CAC=0 (1.4% vs. 5.2%, $p=0.03$) (2). Naya contributed to a number of studies that demonstrated the clinical importance of global CFR measured by myocardial perfusion PET (3-5). In a recent study, Naya et al. evaluated 290 consecutive patients undergoing ^{82}Rb myocardial perfusion PET and angiography (4). The study demonstrated that a preserved CFR (>1.93) has a high negative predictive value (97%) for excluding high-risk CAD, defined as 2- or 3- vessel disease, or left main CAD on angiography (4).

Approximately 90% of myocardial $^{99\text{m}}$ technetium sestamibi (MIBI) is localized within a mitochondrial fraction. An increased MIBI washout is thought to be related to impaired mitochondrial function coexisting with myocardial damage. Satoru Ohshima (Nagoya PET Imaging Center) and his colleagues demonstrated that the $^{99\text{m}}$ technetium sestamibi (MIBI) washout rate is correlated with an impairment in the myocardial contractile and relaxation reserve during dobutamine stress in patients with dilated cardiomyopathy (DCM) (6). In addition, Ohshima et al. demonstrated that an increased myocardial MIBI washout was correlated with a decrease in myocardial mitochondrial mRNA expression or an abnormal morphology of mitochondria in DCM patients (6). The results imply that myocardial MIBI washout rate can be an excellent marker to assess myocardial dysfunction caused by mitochondrial damage in DCM patients. In the 25th JSNC annual meeting, the JSNC award was given to Ohshima for his great achievements. Besides the MIBI imaging, Ohshima made a great achievement in the molecular imaging of atherosclerosis. Ohshima et al. demonstrated that $^{99\text{m}}$ technetium-labeled matrix metalloproteinase inhibitor is useful for assessing the anti-atherosclerotic effect of minocycline (MC) intervention in the animal experiment (7).

Myocardial imaging with ^{123}I -metaiodobenzylguanidine (MIBG), an analog of norepinephrine, has the unique feature of visualizing sympathetic nervous function. Shu Kasama (Gunma University) and his colleagues evaluated the washout rate of MIBG scintigraphy in 213 consecutive patients with ST-segment elevation myocardial infarction (STEMI), with respect to the prognostic values (8). Of 213 patients, 46 experienced MACE during the follow-up period (median follow-up period, 982 days). On Kaplan-Meier analysis, the event-free rate of patients with a WR $<40\%$ was significantly higher than that in patients with a WR $\geq 40\%$ ($p<0.001$) (8). Even when confined to patients with LVEF $>45\%$, MIBG washout rate was a

predictor of MACE, pump failure death, cardiac death and progression of heart failure in patients with STEMI (8). Kasama produced splendid achievements in a number of clinical studies of MIBG scintigraphy (9-11). Kasama also contributed to a multicenter study of MIBG scintigraphy using a large cohort database in Japan (12). The 15th JSNC award was given to Shu Kasama (Gunma University) for his outstanding contributions to nuclear cardiology.

Apply for the 17th JSNC award

Until 2015, sixteen investigators have received the JSNC award. The award winners and their honored research titles are listed in Table 1. The 17th JSNC award will be given in 26th JSNC scientific annual meeting to be held in Tsu, Mie. Since the award is intended not only to reward outstanding researchers, but also to offer the great opportunity to share the latest well-organized research achievements with other JSNC members, the authors would like to recommend the eligible researchers to apply for the prestigious JSNC award.

The following is application requirements for the 17th JSNC award.

The 17th JSNC award

Eligibility criteria

- A JSNC member who demonstrated excellence in his/her recent 5-year research, showed exceptional future contributions to nuclear cardiology, and is at age 50 years or younger as at April 1st, 2016.

Due date for the application

- March 31st, 2016

Required application documents

- Application form (JSNC-designated)
- Recommendation letter
- Resume
- Summary of research achievements in the field of nuclear cardiology (2000 words or less in Japanese)
- List of published work (in English)
- Separate volume of 3 major literatures that the applicant achieved.

Addressee

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Table 1 The JSNC award past winners

JSNC award	Year	Award winner	Research title
1st	2000	Ryuji Nohara	Basic and clinical research of myocardial metabolism using PET and SPECT with BMIPP
2nd	2001	Ichiro Matsunari	Assessment of myocardial viability with SPECT
3rd	2002	Ikuo Yokoyama	Early diagnosis of arteriosclerotic disease in high-risk patients with PET imaging.
4th	2003	Hidehiro Iida	Methodological development of quantitative assessment in myocardial functional imaging
5th	2004	Tomoaki Nakata	Heart failure and cardiac sympathetic nervous system functional imaging
6th	2005	Junichi Taki	Assessment of cell death in ischemic myocardium using apoptosis imaging
7th	2006	Yutaka Kagaya	Assessment of energy substrate metabolism and intracellular information transmission system in the myocardium during stress using nuclear medicine
8th	2007	Masao Miyagawa	Cardiac molecular imaging: from pharmacologic stress to monitoring of gene expression
9th	2008	Shinro Matsuo	Pathophysiology and prognostic assessment of heart failure
10th	2009	Keiichiro Yoshinaga	Development of diagnostic method for early detection of coronary atherosclerotic disease and myocardial metabolic dysfunction using PET imaging
11th	2010	Naoya Matsumoto	Role of myocardial perfusion imaging in the era of multimodality cardiac imaging
12th	2011	Nobuhiro Tahara	Inflammation and atherosclerosis detecting PET imaging
13th	2012	Satoshi Isobe	Assessment of cardiomyopathy with nuclear medicine
14th	2013	Masanao Naya	Prognostic value of coronary flow reserve using PET in patients with myocardial ischemia
15th	2014	Shu Kasama	Evaluation of heart failure using cardiac sympathetic nervous system function imaging
16th	2015	Satoru Ohshima	Relationship between ^{99m} Tc-technetium sestamibi washout rate and myocardial dysfunction in DCM patients, molecular imaging with ^{99m} Tc-Technetium-labeled matrix metalloproteinase inhibitor, and PET imaging in hemodialysis patients

Conclusions

The JSNC award is annually given to an outstanding investigator who is making major contributions to the advancement of nuclear cardiology. Key research topics in the recent 3-year JSNC award, including the clinical value of CFR measured by PET, myocardial MIBI washout rate as a marker to assess mitochondrial damage, and prognostic value of MIBG imaging in patients with heart diseases, were introduced in this article. The authors strongly recommend the eligible researchers to apply for the JSNC award.

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Conflicts of Interest

None

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