The first European Congress of Cardiology, predecessor of the European Society of Cardiology (ESC) Congress, was held in London in September 1952. The congress was initially held every 4 years until 1988 when it became an annual congress. It is one of the leading conferences in cardiology globally, and is held in a European city every year, such as Amsterdam in 2013 and Barcelona in 2014. This year, for the first time in 63 years, it was held in London, United Kingdom. The townscape and atmosphere of London were excellent, with a combination of the past and the present. This year’s poster of the Congress featured a “Big Ben” motif (Figure 1).

The 2015 Congress, which was held between 29 August and 2 September 2015, achieved great success, with more than 32,000 delegates and 5,000 exhibitors from 140 countries. A number of the latest scientific presentations, including 28 clinical hot lines, 18 clinical trial updates, 20 registry studies, 12 basic and translational science hot line studies, and 4,533 abstract studies, provided useful education in cardiology. It should be noted that 580 of the 4,533 abstracts were contributed from Japan, and the total number of abstracts in the past 3 years was the highest in the world. We appreciate the great contribution made to the ESC Congress by Japanese cardiologists and scientists (Figure 2).

The program was well planned for learning purposes, but it was common practice that several interactive sessions were held concurrently in different rooms. In order to allow delegates to fully experience all of the sessions, ESC offered a web-based free access page, “ESC Congress 365” (http://congress365.escardio.org/). With this, we are able to review all videos, slides, abstracts and reports of the Congress and extend our knowledge at any time.

Key Words: Cardiology; European Society of Cardiology; Guidelines; Meeting report

Figure 1. This year’s poster of the Congress was designed with a “Big Ben” motif (A, C). Big Ben is the nickname for the Elizabeth Tower (B), which is one of the most prominent symbols of London.
PATHWAY-2
Resistant hypertension is defined as uncontrollable blood pressure despite administration of 3 antihypertensive drugs: an angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker, calcium-channel blocker, and thiazide-like diuretic. The PATHWAY-2 study randomized 335 patients with resistant hypertension to sequentially receive 12 weeks of spironolactone (25–50mg), bisoprolol (5–10mg), doxazosin (4–8mg) and placebo. The primary endpoint of a reduction in blood pressure with spironolactone compared with placebo was 8.7 mmHg (P<0.001), 4.03 mmHg with doxazosin (P<0.001), and 4.48 mmHg with bisoprolol (P<0.001). Professor Bryan Williams (University College, London, UK) concluded that spironolactone is overwhelmingly the most effective drug treatment for resistant hypertension.

Here, we report the highlights and several interactive presentations from the ESC Congress 2015.

**Hot Line Sessions**

PARAMETER
Principal results of the PARAMETER study were disclosed. The results of PARADIGM-HF reported at last year’s ESC Congress were sensational, and angiotensin-receptor nepriyisin inhibitor (LCZ696) is now one of the most discussed topics among cardiologists. The PARAMETER study was a multicenter, randomized, double-blind, active-controlled trial to assess the effect of LCZ696 compared with olmesartan at 12 and 52 weeks on central aortic systolic pressure (CASP) in older hypertensive patients. A total of 454 patients aged >60 years were randomized to either LCZ696 400mg daily or olmesartan 40mg. Results at 12 weeks of the primary endpoint showed that LCZ696 reduced CASP by 12.6 mmHg compared with 8.9 mmHg for olmesartan (P=0.01). The significant reduction by LCZ696 compared with olmesartan was also present during 24-h ambulatory systolic blood pressure, especially at night-time. At 52 weeks, no difference was found in CASP and systolic blood pressure between groups, because of add-on antihypertensive therapy.
The primary endpoint was the first event of death from any cause, lifesaving cardiovascular intervention (cardiac transplantation, implantation of a ventricular assist device, resuscitation after sudden cardiac arrest or appropriate lifesaving shock), or unplanned hospitalization for worsening HF. The secondary endpoint was both all-cause and cardiovascular mortality. Although the mean AHI in the ASV group was significantly reduced, the incidence of the primary endpoint did not differ significantly between the ASV group and the control group (54.1% and 50.8%, respectively; hazard ratio 1.13, 95% confidence interval [CI] 0.97–1.31, P=0.10). All-cause mortality and cardiovascular mortality were significantly higher in the ASV group than in the control group (hazard ratio for death from any cause 1.28, 95% CI 1.06–1.55, P=0.01; and hazard ratio for cardiovascular death 1.34, 95% CI 1.09–1.65, P=0.006). Professor Martin Cowie (Imperial College London, London, UK), the principal investigator, warned that ASV therapy should not be used in patients with central sleep apnea and reduced EF.

**SERVE-HF**

Central sleep apnea is an independent risk factor for poor prognosis and death in patients with heart failure. The SERVE-HF trial was designed to investigate the effects of adaptive servoventilation (ASV) in patients who had HF with reduced ejection fraction (EF <45%) and predominantly central sleep apnea (apnea-hypoxia index [AHI] >15). In total, 1,325 patients were randomized to either guideline-based medical treatment with ASV or guideline-based medical therapy only (control). The primary endpoint was the first event of death from any cause, lifesaving cardiovascular intervention (cardiac transplantation, implantation of a ventricular assist device, resuscitation after sudden cardiac arrest or appropriate lifesaving shock), or unplanned hospitalization for worsening HF. The secondary endpoint was both all-cause and cardiovascular mortality. Although the mean AHI in the ASV group was significantly reduced, the incidence of the primary endpoint did not differ significantly between the ASV group and the control group (54.1% and 50.8%, respectively; hazard ratio 1.13, 95% confidence interval [CI] 0.97–1.31, P=0.10). All-cause mortality and cardiovascular mortality were significantly higher in the ASV group than in the control group (hazard ratio for death from any cause 1.28, 95% CI 1.06–1.55, P=0.01; and hazard ratio for cardiovascular death 1.34, 95% CI 1.09–1.65, P=0.006). Professor Martin Cowie (Imperial College London, London, UK), the principal investigator, warned that ASV therapy should not be used in patients with central sleep apnea and reduced EF.

**Leadless II**

Leadless pacemakers have been developed to reduce the adverse events of conventional pacemakers, such as lead dislodgement, infection, cardiac perforation, venous occlusion, and tricuspid regurgitation. The device is a single-chamber.
pacemaker, 42 mm long and 6 mm wide, and delivered to the right ventricle via femoral vein using a 18F catheter. The Leadless II was designed to evaluate the clinical safety and efficacy of non-surgical implantation of the leadless cardiac pacemaker system. The study consisted of the primary cohort (n=300) with 6-month follow-up, and an additional 220 patients. Results showed that the primary efficacy endpoint, both an acceptable pacing threshold (≤2.0 V at 0.4 ms) and acceptable sensing amplitude (R wave ≥5.0 mV) through 6 months, was observed in 270 of 300 patients (90%). The primary safety endpoint was observed in 280 of 300 patients (93.3%). The adverse events were cardiac perforation (1.3%), vascular complications (1.3%), dislodgement (1.7%), and elevation of pacing threshold with retrieval and implantation of new device (1.3%).

**CIRCUS**

Ventricular remodeling caused by reperfusion injury during percutaneous coronary intervention (PCI) is a serious problem with a poor prognosis. The CIRCUS trial was designed to determine whether cyclosporine improves clinical outcomes in ST-segment elevation myocardial infarction (STEMI) patients. The study randomized 970 patients with STEMI to receive either intravenous cyclosporine (2.5 mg · kg⁻¹ · body⁻¹) or placebo before PCI. The primary endpoint was a combined incidence of all-cause mortality, worsening HF during initial hospitalization (or re-hospitalization for HF), left ventricular remodeling (increase of 15% or more in end-diastolic volume) at 1 year. The rate of the primary outcome was 59% in the cyclosporine group and 58.1% in the placebo group (odds ratio 1.04, 95% CI 0.78–1.39, P=0.77). There were no differences between the groups in the incidence of the separate clinical components of the primary outcome or other events, including recurrent infarction, unstable angina, and stroke.

**Spotlight of ESC Congress 2015**

This year’s Spotlight of the Congress was “Environment and the Heart.” The close linkage between air pollution and health is well known. The OECD estimates that by 2050 urban air pollution will be the top environmental cause of mortality worldwide. Global action on the issue is urgently required, but this area remains unknown territory for many cardiologists. Therefore, the Congress focused on this problem, and cautioned cardiologists with more than 100 abstracts on air pollution and myocardial infarction or stroke, noise and smoke on cardiovascular diseases, and the daily effects of cell phone or wireless electronic devices on patients with pacemakers.

**ESC-JCS Joint Session**

The ESC and the JCS had 2 joint sessions during the Congress. On 30 August, the first joint session titled “Impact of optical coherence tomography (OCT) and computed tomographic angiography (CTA) on the management of acute coronary syndrome (ACS)” was chaired by Professor Fernando Alfonso (Hospital Clinico San Carlos, Madrid, Spain) and Professor Takashi Akasaka (Wakayama Medical University, Wakayama, Japan) (Figure 4). This session focused on the role of CTA and OCT in diagnosing the mechanism for ACS compared with pathological findings. The first speaker of the session was Professor Arbustini Eloisa (Policlinico San Matteo, Pavia, Italy) who gave an overview of the research history of vulnerable plaque in pathology from past to present, and pointed out the fibrous cap, lipid core, and inflammation as traditional players in plaque instability. She also pointed out hemorrhage and angiogenesis as new players in plaque instability, and asked for continuing research into the use of OCT in this area. The next speaker, Professor Yukio Ozaki (Fujita Health University, Toyoake, Japan) demonstrated his extensive research of the ACS mechanism using CTA and OCT. He advocated the use of the OCT-based terms, “ACS with intact fibrous cap (ACS-IFC)” and “ACS with ruptured fibrous cap” in the clinical settings. Professor Francesco Prati (San Giovanni Hospital, Rome, Italy) presented that the culprit lesion morphology derived by OCT has prognostic implications in patients with ACS. Lastly, he introduced OCT-based management of...
Dr Peter Ong (Robert-Bosch-Krankenhaus, Stuttgart, Germany) demonstrated that approximately half of the patients in Germany who had myocardial ischemia without obvious stenosis on angiography were positive for acetylcholine provocation test. Finally, he noted the safety of the acetylcholine provocation test, and emphasized the importance of the test for patients with myocardial ischemia without obvious stenosis.

Professor Hisao Ogawa (Kumamoto University, Japan) overviewed coronary spasm after PCI in Japan. He presented the differences in coronary response and cardiovascular events after bare metal stents, 1st and 2nd generation DES implantation. He introduced hyperemic microvascular resistance (HMR) by ComboWire® as a new marker of coronary microvascular resistance, and HMR is elevated in patients with vasospastic angina with coronary microvascular dysfunction. He concluded that epicardial coronary spasm and/or coronary microvascular disorders are associated with cardiovascular event risk after PCI. However, the risk in clinical practice varies according to stent type. Professor Filippo Crea
angiography can be classified into 4 categories: immediate invasive strategy (<2 h), early invasive strategy (<24 h), invasive strategy (<72 h), and selective invasive strategy. With coronary angiography and intervention, radial access is recommended for a lower bleeding rate and significant reductions in total mortality compared with femoral access (Class I, Evidence level A). For the optimal duration of dual antiplatelet therapy (DAPT), the guidelines recommend the traditional 1-year period. However, shorter (3–6 months) or longer (30 months) duration with DAPT could be considered according to individual risk of bleeding and ischemic events. Finally, the important role of secondary prevention is emphasized, such as lifestyle changes, exercise, smoking cessation and drug therapy. In particular, LDL-lowering therapy with high-intensity statin is important.

Diagnosis and Treatment of Pulmonary Hypertension (PH)

The guidelines on PH updated the latest findings and evidence, including definitions and classification, epidemiology and genetics, diagnosis, and specific treatments. The guidelines provide details of appropriate diagnosis of PH, as well as the latest treatment strategies with newly-approved drugs for pulmonary artery hypertension and chronic thromboembolic PH. In addition, the last section of “to-do and not-to-do messages

Five New Practice Guidelines

Management of ACS in Patients Without Persistent ST-Segment Elevation

The guidelines emphasize rapid diagnosis and risk stratification in non-ST-segment elevation-acute coronary syndrome. In this context, high-sensitivity cardiac troponin T assays have received particular attention in the guidelines (Class I, Evidence level A). According to risk stratification, the timing of angiography can be classified into 4 categories: immediate invasive strategy (<2 h), early invasive strategy (<24 h), invasive strategy (<72 h), and selective invasive strategy. With coronary angiography and intervention, radial access is recommended for a lower bleeding rate and significant reductions in total mortality compared with femoral access (Class I, Evidence level A). For the optimal duration of dual antiplatelet therapy (DAPT), the guidelines recommend the traditional 1-year period. However, shorter (3–6 months) or longer (30 months) duration with DAPT could be considered according to individual risk of bleeding and ischemic events. Finally, the important role of secondary prevention is emphasized, such as lifestyle changes, exercise, smoking cessation and drug therapy. In particular, LDL-lowering therapy with high-intensity statin is important.

Figure 6. Advances in Science session entitled “State of the art in invasive imaging and functional assessment” chaired by Professors Fernando Alfonso (Hospital Clinico San Carlos, Madrid, Spain) and Yukio Ozaki (Fujita Health University, Toyoake, Japan) (Left). Professor Takashi Akasaka (Wakayama Medical University, Wakayama, Japan) (Right) presented the topic entitled “State of the art in invasive imaging and functional assessment.”
from the guidelines” is a simple summary of the diagnosis and treatment strategies, which is helpful in daily clinical practice for patients with PH.

Ventricular Arrhythmias and Prevention of Sudden Cardiac Death (SCD)

The guidelines focus on the prevention of SCD,17 emphasizing the importance of identification of high-risk patients because the first clinical manifestation of sudden death is often lethal. An autopsy is recommended to investigate the cause of sudden death and to define whether SCD is secondary to an arrhythmic or non-arrhythmic mechanism. Identification of the cause of an unexpected death provides the family with partial understanding, which facilitates the coping process and allows them to become aware of immediate family members who are also at risk of sudden death. The last sections, “Gaps in evidence” and “to-do and not-to-do messages from the guidelines”, are brief summaries of the guidelines.

Diagnosis and Management of Pericardial Diseases

The guidelines provide new diagnostic strategies proposed for acute and recurrent pericarditis in patients to be admitted. Moreover, specific diagnostic criteria or defibrillator-lead IE. The ESC 2015 modifies the criteria for the importance of multimodality imaging with chest X-ray, echocardiography, computed tomography (CT) and cardiac magnetic resonance (CMR) and assessment of inflammatory or cardiac injury biomarkers, as well as careful assessment of medical history, are emphasized to select high-risk patients to be admitted. Moreover, specific diagnostic criteria have been proposed for acute and recurrent pericarditis in clinical practice.

Prevention, Diagnosis and Treatment of Infective Endocarditis (IE)

The guidelines focus on prophylaxis for IE.19 The important point is that antibiotic prophylaxis is considered only for the high-risk patients (eg, any prosthetic valves; previous episode of IE; any type of cyanotic congenital heart disease (CHD) or CHD repaired with a prosthetic material; residual shunt or remaining valvular regurgitation) when a high-risk procedure is performed, as in the previous guidelines on IE. In the clinical settings, the modified Duke criteria were recommended in the diagnosis of IE. However, the criteria show a lower diagnostic accuracy for early diagnosis in clinical practice, especially in the case of prosthetic valve endocarditis and pacemaker or defibrillator-lead IE. The ESC 2015 modifies the criteria for the diagnosis of IE. Multimodality imaging techniques such as CMR, contrast-enhanced multislice CT, and nuclear imaging by 18F-FDG PET/CT, in addition to conventional transesophageal echocardiography, and transthoracic echocardiography, are strongly recommended. It is essential to note that the guidelines strongly support the management of patients with IE in reference centers by a specialized team (the ‘Endocarditis Team’) that includes a cardiologist, an infectious disease specialist, a microbiologist, imaging specialist, and a cardiac surgeon.

Other Sessions

There were many other sessions, including symposiums, debate sessions, Advances in Science, Meet the Experts, Rapid Fire Abstracts, Young Investigators Awards Abstracts, moderated posters, poster sessions, and so on. Even in these sessions, there were many presentations by Japanese cardiologists as demonstrated in Figure 6.

Closing Remarks

The ESC Congress 2015 in London was a great success, with the latest and exciting scientific sessions. We acknowledge the meaningful contributions of both Japanese cardiologists and the JCS to the Congress. We hope this report delivers a brief summary and helps to provide an insight to the Congress. Much research and many important trials are currently in progress. Thus, we hope other young cardiologists in Japan will submit their abstracts and participate in the 2016 Congress to be held in Rome, Italy. We look forward to discussing the abstracts in Rome.

Acknowledgments

We thank Shenli Hew from the Department of Clinical Research Center, Wakayama Medical University, for proofreading and editing the manuscript.

Disclosures

T.A. is a Fellow of the European Society of Cardiology (FESC). The authors report no conflicts of interest to disclose.

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