Nuclear Cardiology and Cardiac CT
ESC Working Group
EUROPEAN SOCIETY OF CARDIOLOGY®

Newsletter Number 9 August 2008 Editor: Joanne Schuijf

Message from the Chairman

Dear Friends,

It is again the time to start looking forward to our most important annual event, the ESC congress 2008. This year the theme of the congress is imaging. What theme could be better to that!

The theme of imaging will be shown as more integrated imaging talks in clinical sessions, but not as larger number of dedicated imaging sessions. I think this is the best strategy since we aim to educate those physicians and cardiologists that are not experts of imaging. We have to keep in mind that vast majority of ESC participants are cardiologists that are not specialized to any subspecialty.
By help of you also, great prearranged and abstract sessions were easy to compose. Being an Imaging coordinator of the Congress Program Committee (CPC) taught me a lot how important indeed it is that excellent sessions are submitted by the members and WGs. Our field of cardiovascular imaging will be again well exposed in the program of 2008. Since I have been appointed to this job for another 2-year term by a new CPC chairman Fausto Pinto, I have good possibility to develop further the visibility of imaging at ESC congress.

I would like to express my deep thanks to the participants in the Brainstorming Meeting in Kitzbuehel. I believe the meeting was a success in many ways. The program was excellent; the traditional venue Hotel Tennerhof was great and social program exceptional again. For those who skied, the event was successful with loads of new powder snow. I would like to thank especially Heinz, who did again great job with the venue, and to Nili, Johan and Michael, who created a stimulating programme. Later in this Newsletter more detailed report can be found.
We are also looking forward to the most important meeting of our imaging field, ICNC9, Nuclear Cardiology and Cardiac CT in Barcelona May 2009. Prearranged program is almost finished and will be distributed soon.

Finally, as this is likely the last Newsletter while I am a chairman of the WG, I would like to thank all nucleus and regular members for this two year term. It has been pleasure to work for you. Especially those nucleus members who have delivered their tasks have been invaluable for the WG's success. I believe that we have been able to further improve our performance but we can still develop our actions. One of the challenges is to get regular members more actively involved with the business of WG.

Best regards,
Juhani

Brainstorm Meeting in Kitzbuhel

Report contributed by Juhani Knuuti, MD, FESC

This time we went back to the traditional format of program with plenty of time for discussions and very strictly limited time for presentations. This allowed us to concentrate only on a few important topics that were discussed in depth.

This time the number of attendees was limited to 40 that seem to be quite ideal size for this kind of brainstorming meeting.

The meeting also demonstrated well how innovative we really are when trying to go around of the rules of maximum slides. There seems to be hundreds of ways to hide 10 slides into the set of 3.

The program consisted of 5 sessions with 15 minute introductory presentation about the following 5 topics:

- PET: Moving from research to clinical practice.
- Clinical algorithms for integrating CT in CAD workup and the role of other modalities.
- Combined Imaging and hybrid imaging - an update.
- Industry perspectives
- Imaging in heart failure - an update.

After introduction of each topic several short commentaries (max 3 slides) were given allowing almost everybody to contribute. This produced very active discussion and debate, especially since the topics were those which are currently very hot ones.

Participants of the Brainstorm Meeting 2008, viewed from the top…

In the PET session perfusion imaging quantification, gene imaging, plaque imaging as related to clinical role of PET were discussed.
In the following sessions the current trends in integrating CT in CAD workup and the role of combined and hybrid imaging were dealt.
Then industry representatives shared their visions towards imaging and finally updates of imaging in heart failure including cell therapy, devices, apoptosis and sympathetic system were presented.

Heinz Sochor, Ernst Hinterseer and accordionist.

The social program was a great experience, as usually in Kitzbuehel. The venue has exceptional atmosphere. In general, this meeting is unique in its spirit and stimulation for both experienced and younger participants. It is indeed important to allow also young people to attend but not to expand the meeting too much. The next Brainstorming meeting is under planning phase but is likely happening in the fall 2009 at new, currently still secret venue.

Selection of Nuclear Cardiology and Cardiac CT abstracts of the 57th Annual Scientific Session of the American College of Cardiology in Chicago

Contributed by Joanne Schuijf

Technical advances

During the conference, new myocardial perfusion agents and reconstruction techniques were introduced. In one of the late breaking abstract sessions, the results from VISION 302 and VISION 305 trials were presented by Udelson et al. (*Udelson JE, Iteld B, Weiland F et al. Efficacy and Safety of the selective Adenosine A2A receptor agonist Binodenoson for pharmacologic stress: Results of a Phase 3, randomized, double blind, risk-stratified, active-controlled crossover trial.*). In VISION 302, the safety and efficacy of a highly selective adenosine A2A receptor agonist, binodenoson, was evaluated in 415 patients referred for pharmacological stress myocardial perfusion imaging (MPI) due to suspected or known coronary artery disease (CAD). All patients underwent 2 double-blind, double dummy MPI procedures using either binodenoson or adenosine stress in random order, revealing no significant differences between the techniques in measures of severity and extent of ischemia. Side effects on the other hand, including 2nd or 3rd degree atrioventricular block, occurred less frequently or were less intense during binodenoson, resulting in a significant preference of patients for binodenoson (71%) over adenosine (20%).

In several abstracts, improved efficiency for SPECT MPI through the

use of novel reconstruction techniques was reported. Bateman et al. (*Bateman TM, Heller GV, McGhie AI, et al.Application of simultaneous Gd-153 line source attenuation correction to half-time stress only SPECT acquisitions: a multicenter clinical evaluation.*) reported on the image quality and accuracy of half time stress only acquisitions with line-source attenuation correction 110 patients who underwent underwent rest/stress SPECT with line-source attenuation correction. Half time scans were obtained by retrospective reconstruction of the 'full time' scans. Importantly, no statistical differences in image quality, interpretive certainty, sensitivity, specificity and normalcy were observed.

Similarly, improved efficacy was reported by Maddahi et al. (*Maddahi J, Mendez R, Babla H, Bai C, Arram S, Conwell R. Prospective multicenter clinical evaluation of rapid SPECT myocardial perfusion upright imaging.*). The authors evaluated acquisition times as well as the diagnostic quality of the images in 448 patients using a novel reconstruction technique for SPECT myocardial perfusion imaging (3D-OSEM image reconstruction technique (nSPEED)). As compared to the standard approach (2D-OSEM iterative reconstruction), mean acquisition times for stress and rest studies were significantly reduced using nSPEED (respectively 3.5 and 4.1 minutes) as compared to the standard approach (6.4 and 7.8 minutes). No difference in image quality was observed, and 99% of studies were considered to be diagnostically equivalent, indicating that nSPEED allows reduction of image acquisition times without compromising diagnosis.

The efficacy of novel dose-saving algorithms was evaluated by Hausleiter et al. (*Hausleiter J, Meyer T, Hermann F, et al. International Prospective Multicenter Study On RadiaTion Dose Estimates Of Coronary CT AngIOgraphy IN Daily Practice – the PROTECTION I study.*). In total, 44 centers contributed to the PROTECTION I study resulting in 1965 multi-slice computed tomography coronary angiography (CTA) studies available for analysis. Substantial differences in radiation dose between centers (8.5-43.8 mSv) and scanner systems (11.8-25.2 mSv) were noted. Tube modulation and lowered x-ray energy (100kV instead of 120kV) were identified as approaches that contributed the most to dose reduction.

Differences in X-ray energy were also applied in several abstracts with another motive than dose reduction. In an ex-vivo study by Komatsu et al (*Komatsu S, Kuhlmann A, Campean V, et al. Plaque characterization using different x-ray energy by dual source CT and comparison with histology.*), dual source CT was used for plaque characterization. DSCT data sets with different tube voltages (ranging between 80-140 kV) were obtained and subsequently the attenuation of lipid-rich, fibrotic and calcified plaque was determined and compared to the attenuation of the contrast-filled lumen. Using histology as the gold standard, different ratios between plaque and lumen attenuation were identified between differing x-ray energies for each plaque type. Possibly, variation of x-ray energy may assist in the characterization of plaque component.

In another study, DSCT was applied to visualize blood-pool defects. In 35 patients dual energy CT was performed by Ruzsics et al. (*Ruzsics B, Suranyi P, Leoo H, et al. Coronary CTA and myocardial blood pool analysis using cardiac dual-energy CT: initial experience.*) with the X-ray tubes set at 14kV and 100 or 120kV, respectively. Using a dedicated reconstruction algorithms, myocardial iodine distribution was mapped allowing detection of perfusion defects. On a segmental basis, this novel CT approach detected myocardial ischemia with a sensitivity of 84%, a specificity of 94% and an accuracy of 92% as compared to SPECT.

Prognosis and cost-effectiveness

The strong prognostic value of stress myocardial perfusion imaging has been well-established during the past decades. However, less data are available with regard to the identification of long-term post MPI therapeutic benefit with revascularization as compared to medical therapy. Therefore, Hachamovitch et al identified 10,609 patients who underwent MPS (*Hachamovitch R, Gransar H, Kang X, et al. Sress myocardial perfusion SPECT is predictive of the long-term therapeutic benefit of revascularization versus medical therapy.*)
During an average follow-up of 3 years, all cause death occurred in 25% of patients. Analysis of the data revealed a threshold of 10% of ischemic myocardium to identify patients with a survival benefit from revascularization over medical therapy. Moreover, increasing amount of ischemia was found to be related to increasing benefit from more aggressive therapy.

The lack of cost-effectiveness data has been a major critique of CTA. Min and colleagues therefore investigated this issue by comparing cost-effectiveness of CTA to matched patients undergoing MPI using the recently assigned transaction codes (*Min JK, Kang N, Shaw LJ et al. Cost-effectiveness of coronary computed tomographic angiography using medicare category III transaction codes (T-codes): A matched comparison to myocardial perfusion SPECT*). Measures of cost- and clinical-effectiveness were obtained in the 9 months following the initial testing. In total, 2,313 patients were matched to a cohort of 9,252 patients who underwent MPI. No difference was observed in the rate of clinical events between two groups. However, the rate of PCI was slightly higher after anatomic testing with CTA as compared to MPI. Despite this observation however, use of CTA was demonstrated to result in a 9% cost reduction. Importantly, this reduction was attributable to patients without a history of CAD. In contrast, use of MPI was shown to be more cost-effective in patients with known CAD.

Fusion of Cardiac CT and Nuclear Cardiology

Finally, data on semi-automatic fusion of 64-slice CTA and MPI data were presented by Slomka et al (*Slomka PJ, Suzuki Y, Cheng V, et al. Combined quantitative analysis of 64-slice coronary CT angiography and myocardial perfusion SPECT.*). In 38 patients in whom 64-slice CTA, MPI and invasive coronary angiography was performed, non-invasive data were fused using a dedicated

algorithm. Direct visualization of functional data facilitated diagnosis with CTA in patients with extensive calcifications or motion artefacts, whereas the visualization of anatomy allowed adjustment of vascular territories on MPI and LV contours. Accordingly, retrospective combination of the anatomical and functional data may have the potential to improve diagnostic certainty and accuracy, although more data are needed.

ESC Training Course In Nuclear Cardiology and X-ray CT – 29-31 May 2008

Contributed by Richard Underwood

The most recent version of our annual training course took place at the European Heart House in late May. As always it was judged to be a success by both delegates and faculty with one exception: the weather was highly unseasonal and reminded us of the first two ICNC congresses in Cannes that were marked by non-stop rain. Fortunately, this did not manage to dampen the spirit of over a hundred attendees who had the opportunity to discuss current practice in nuclear cardiology and cardiac CT and to learn about the future of the sub-specialty. As always, the lecturers were of a very high standard and we are particularly grateful to Dr Wackers and Germano for having come so far, although Frans Wackers is now semi-retired and living not quite so far away in South-West France.

The basics of nuclear cardiology and cardiac CT were covered by Drs Underwood, Reyes, de Feyter and Germano and then clinical aspects were covered by Drs Kaufmann, Underwood, De Feyter, Wackers and Bax. There was particular interest in the advanced techniques described by Drs Knuuti, Bax and De Feyter and the Read with the Experts sessions with Drs Germano, Harbinson, Kaufmann and Schuijf provided the opportunity for interactive discussion of clinical cases in an environment similar to that of everyday reporting. Finally, a popular variation on this theme entitled “Stump the Stars” had a number of the stars of nuclear cardiology and cardiac CT testing their reporting skills on unknown cases presented by the audience and their co-stars.

Faculty of the 2008 Course

If you have not had the opportunity to attend this course please consider registering for next year (28-30 May 2009). Whether you are new to the field, wanting to update your skills, or simply to interact with and learn from excellent teachers in the field, you will not be disappointed. It is now the most popular training course run by the ESC and something that you should experience at least once in your career. We look forward to seeing you and to better weather next May.

Forthcoming International Meetings

ESC Congress 2008

Munich, Germany
August 30 - September 03
The highlight of the congress this year is Cardiovascular Imaging

For details:
www.congress@escardio.org

Full scientific program available at:
http://spo.escardio.org/Welcome.aspx?eevtid=24

Meetings of the Working group during ESC:
Nucleus meeting:
Sunday 31 August 14.00-15.00
Room 8 (1st floor Zone C)

General assembly:
Monday 1 September 14.00-15.15
Room 8 (1st floor Zone C)

"Nuclear Cardiology and Integrated Cardiovascular Imaging Today"
Cesena, Italy
September 18-20

Submission of abstracts is encouraged and the three best scientific original contributions will be awarded the "Nuclear Cardiology and Integrated Cardiovascular Imaging Award".

Deadline July 31st 2008

For details: *www.ausl-cesena.emr.it/nuclearcardiologytoday*

For any further information please contact the Organizing secretariat Cetra Congressi e-mail:
cetra@cetranet.it

EANM´08 Annual Congress of the European Association of Nuclear Medicine
Munich, Germany
October 11-15
http://eanm08.eanm.org/

EANM Pre-Congress Symposia
Saturday, October 11, 2008

Program
Cardiovascular Multimodality Imaging:
Part 1: Diagnostic and Prognostic Workup of Coronary Artery Disease-State of the Art in 2008
Part 2: Heart failure: Role of Non-Invasive Imaging

Acute Cardiac Care
Versailles, France
October 25-28

EUROECHO 2008
Lyon, France
December 10-13

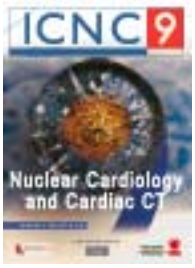
Certification Examination for Nuclear Cardiology and Cardiac CT 2008

This certification exam is arranged yearly (since 2004) by the Certification Board of Nuclear Cardiology (CBNC), in cooperation with the European Council of Nuclear Cardiology (ECNC).
Date: December 1 - 6

Final deadline for registration
September 29 2008.
For details:
http://www.cbnc.org/theexam/candidatebulletin.cfm

EuroPRevent 2009
Stockholm, Sweden
May 6-9 2009

ICNC9 - Nuclear Cardiology and Cardiac CT



Barcelona, Spain
May 10-13, 2009

Abstracts deadline: 29 Sep 2008

Preliminary Scientific Program available at:
http://www.escardio.org/congresses/icnc9/Documents/icnc9-preliminary-programme.pdf

Website of the Working Group

Every month, you can read updates of the literature on Cardiac CT by Dr. S. Schroeder, in addition to the ongoing update on Nuclear Cardiology by Dr J. de Sutter.
You are invited to visit the newly revised website of the Nuclear Cardiology and Cardiac CT WG, designed by our Web Editor, Dr. M. Zellweger. The site includes up-to-date information on WG activities and meetings, the WG's newsletters, and links to other journals.

Joanne Schuijf