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Lecture

Tenth Scientific Congress of the Polish Society of Nuclear Medicine, Białystok 2006 – Highlights Lecture

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Introduction

The Tenth Scientific Congress of the Polish Society of Nuclear Medicine was held on 22nd–24th June, 2006 in Bialystok, the capital of the beautiful Polish Eastern Frontiers — a country of vast plains, open people, zubrovka grass and the famous Bialowieza Wild Forest. It is my pleasure to summarise the Congress, but please forgive my criticisms here and there and/or some nostalgic/sad remarks, also please forgive my omitting some Congress presentations, there were so many of them.

The Congress comprised 12 programme lectures (including 7 by eminent foreign scholars), 54 oral presentations, 66 poster presentations and a vast social programme. All of this was thanks to the organiser; the indefatigable, incredible and magnificent Professor Franciszek Rogowski.

Neurology

From congress to congress, more and more presentations are devoted to neurology; today the main NM neurological centre in Poland seems to be Łódź.

Image fusion: a solid paper by Górska-Chrząstek et al., i.e. a song about how nice is to have SPECT/CT; from the same centre a nice paper on methyltyrosine in brain tumours, a theme both old and new, important because of more and more visible failures of PET in some brain tumours. Also from the same centre there was a presentation on rCBF brain SPECT in systemic lupus erythematosus. The results, as usual in that field, were broad, but not always conclusive. I wrote some papers about it. It's a difficult job…

The problem of brain tumours was also raised by Jakuciński et al., Medical University, Warsaw, stating the occurrence of somatostatin receptors in 75% of brain tumour patients; showing this to be weak as a diagnostic test, but fairly promising as an introduction to peptide therapy, and, in fact, the next paper by the same authors discusses the results of Y-90-DOTA-TATE therapy in patients with inoperable brain tumours, with very promising results.

From the once renowned Gdańsk NM neurological centre there was only one paper by Piskunowicz et al., which was interesting in that it raised the criminal aspects of rCBF SPECT brain scanning, i.e. the application of this technique in forensic medicine, this is a nice niche problem, please continue.

The Military Medical Institute in Warsaw (Bilski et al) is proud to possess the BRASS computer programme and *voxel based analysis*. Today neurological nuclear medicine is hardly possible without 3D analysis.

Cardiology

The presentations concentrated on different means of RI coronary disease analysis. Teresińska et al. from the Institute of Cardiology, Warsaw, assessed heart muscle imminent necrosis using GSPECT and the efficacy of treatment with stent implantation and thrombectomy, the latter was found to be superior. Wnuk, Chojnowska et al from the same centre assessed the efficacy of therapeutic angiogenesis using RI techniques, stating the improvement of EF. Congratulations!

Czepczyński et al. (Medical University, Poznań) worked with the myocardial infarct therapy by the transplantation of bone marrow cells; I am not sure whether I would back administering placebos in experiments of that kind. Miśko, Dziuk et al. (Warsaw) raised an important question concerning the complementary (or

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competitive?) role of SPECT scanning and MRI-gadolinium-enhanced scanning. Radiology attacking, SPECT defending its role, image fusion raises the diagnostic effect very well.

MIBI-SPECT in heart transplant, from Warsaw Cardiology Institute, gave interesting results — lots of perfusion disturbances, mostly diffused ones, sometimes with high progression, showing it to play an important role in the diagnostic algorithm of those patients. Białystok NM centre — Parfieńczyk, Rogowski et al., our kind hosts, studied heart perfusion in systemic sclerosis with some peculiarities both in stress scanning and e.g. inversely improved perfusion at rest in some cases; that's interesting — in vasculitis paradoxical vascular reactivity is quite frequent, I showed it myself some time ago in cerebral circulation.

Pietrzykowski et al. (Warsaw) analysed the influence of heart arrhythmias and heart size on GSPECT results; in a large cohort they found lower EF fraction, which could be expected, but — what is interesting — EF may be artificially high at low end--systolic and end-diastolic volumes. Szczepański, Teresińska et al. (Warsaw) compared the results of heart perfusion scanning utilising two different ways of polar map segmentation: a lower amount of segments in the polar map was shown to decrease the parameters of summarized perfusion deficit (SDS). Szumiński, Płachcińska et al. analysed how the supplementation of myocardial scintigraphy with assessment of contractility improved the efficiency of scanning; in fact, so it went significantly, strangely, the authors criticized the CEqual computer programme so highly advocated by the producer.

Cardiology — risk stratification

Dziuk, Kaźmierczak et al. (Military Medical Institute, Warsaw) assessed the prognostic value of stress heart perfusion scanning in a large group of 174 patients; the strongest prognostic parameter was the positive result of scanning, and its depth; negative results indicated a low probability of grave cardiac events (< 1% per year). Those results are important, as they can help to promote radionuclide techniques among the cardiologists. Another presentation from the same centre analysed the risk of cardiovascular events in non-smoking patients younger that 60 years old with lipid disturbances.

Endocrinology

As usual, the most interesting papers were from Poznań University: two fascinating papers by Kosowicz, Czepczyński et al. on medullary carcinoma; one on gastrin receptors, and the second comparing (V)DMSA and HYNIC-TOC, both with very high efficacy. Medullary carcinoma and its metastases scanned with I-131-MIBG were studied by Łapińska et al. (Institute of Oncology, Warsaw). They had interesting results and nice images, but it is slightly unclear what the reference group was. Two papers from Białystok were devoted to apoptosis; the first one on apoptosis markers after rhTSH and radioiodine therapy, and the second on the correlation of MIBI scanning, hormonal function and apoptotic index — could this be the solution to hypothyreosis prognostication? A very interesting paper from Szczecin was presented by Listewnik, Birkenfeld et al. on ophthalmopathy following radioiodine therapy. They screened files of 4059 patients and found 9 patients with ophthalmopathy following RIT, thus leaving more answers than questions, but it's very good that someone is working with that issue. Carry on.

Endocrinology — NET

An interesting presentation was presented by Jurecka et al. from the Institute of Oncology in Gliwice. They underlined the importance of strict inclusion criteria to RI NET treatment, otherwise it makes little sense in this difficult and costly treatment.

Another interesting paper was presented by Hubalewska et al. from Cracow on intra-operation gamma probe in the surgery of carcinoids and insulinomas, with very good results. From the same centre there was a comparison of CT, MRI an RI studies in NETs of the pancreas (22 cases). The authors say that if scintigraphy is positive, we can operate CT, and MRI has a secondary meaning. Perhaps they are too much in love with their method…but if they are right? They can be.

NETs — technical remarks; Lenda-Tracz et al. (Cracow) compared the results of FBP and iterative (OSEM) SPECT reconstruction modes; OSEM is better than ITW. It was proven in the brain and heart, but in neuroendocrine tumours it is probably new. Congratulations! It's a pity that the material is rather small (14 cases). Szaluś et al. (MMI, Warsaw) analysed the utility of RI/CT image fusion in predicting response to radioisotope therapy; pilot results were very promising, let's wait for more than 4 studied patients.

Depreotide in hypophysis tumours as a specific imaging agent, discriminating other imaging modalities — that's the opinion of Nocuń et al. from Lublin. OK — this could be interesting. However, what would be the place of this costly imaging in the clinical algorithm? What do the neurosurgeons think?

Warsaw Medical University NM centre is faithful to parathyroid imaging. Kobylecka et al. presented three nice papers on it, although the aim of the third one (testing the utility of intra-operation hand-held gamma probe scanning in tumour differentiation) is perhaps too ambitious. However, this or that way, gamma probe scanning gives the best practical results.

Oncology

Oncology — sentinel node

Czepczyński et al. from Poznań showed an interesting series of 19 ENT tumour patients with well-documented efficacy. In more conventional sentinel node RI localisation Jędrzejczak et al from the Institute of Oncology (Warsaw) presented a well-documented series of 286 patients with breast cancer, although with rather static results.

Another paper on the same subject from Wrocław showed very good sensitivity of gammacamera scanning of sentinel nodes — 93%. I wish I could achieve the same sensitivity, but I do believe in hand-held gamma probe SN finding. A similar large series of SN findings by Birkenfeld et al. on 118 melanoma cases by Birkenfeld et al. from Szczecin, gave solid performance, nice results, although I do not fully understand the sense of detecting the sentinel node in upper and lower extremities melanoma cases.

Oncology — peptides

Noble self-criticism was the dominating feature of the presentation on depreotide *vs.* EDDA/HYNIC-TO given by Płachcińska, Mikołajczak et al (Łódź/Świerk); the results are usually the best of

the authors, but here the authors criticized their own results; both tracer scannings, depreotide scanning had better count statistics, false-positive rate was high in mediastinum and hilar region. Jędrzejczak et al. from IO, Warsaw studied the usefulness of depreotide in pulmonary opacities of unknown origin, if the sensitivity is 95%, specificity 82%; if they are right, PET could be forgotten. Really? Unconventional depreotide application in sarcoidosis by Pilecki et al. from Bydgoszcz, in 5 patients some promising results. It's worthy carrying on.

Oncology — varia

Scintimammography — a slightly outdated topic, one might think — and here a nice presentation on the usefulness in prognostication of treatment efficacy by Listewnik, Birkenfeld et al. Interesting.

Further in the mainstream of therapeutic applications: Sowa-Staszczak et al. (Cracow) said that Y-90-Zevalin had consolidated and stimulated the effect of chemotherapy, although the results were quite dispersed (sometimes it worked, sometimes not) and described (at least in the summary) in a style of s.c. hermetic prose.

Image fusion

Image fusion is a very important thing and a second breath for nuclear medicine — if we cannot beat CT/MRI with spatial resolution, let's join them.

D'Amico et al. from Gliwice fused SPECT and 16-row CT images, good job, they say that manually established points of fusion will serve the SPECT/CT Hawkeye device (is the CT part of it so good?). 76 patients, quite a lot, very nice results in abdominal imaging and in gliomas.

There were three nice papers on PET/CT from the Oncological Centre in Bydgoszcz. The first presentation was about natrium-^{18}F-fluoride in detecting bone metastases, PET/CT 3 times better than MDP scanning. Really? The second paper was about 126 patients with ovarian carcinoma, 98% sensitivity and 98% specificity. And a third, perhaps the most interesting in that series, was about PET/CT on neoplasms with unknown sites of origin, sensitivity 55%, which is a good result, regarding known diagnostic difficulties in that group of pathology.

Zuchora et al., from the same centre, presented a paper on PET/CT in brain tumour recurrence; interesting speech, as that aspect of PET scanning is still a matter of controversy, some believe that gadolinium-enhanced MRI is better, the authors defended PET like lions. The same centre and PET/SPECT in craniofacial tumours — interesting, somewhat small subgroups, but it is worth carrying on.

PET

Unavoidable neuroendocrine tumours (NET) — I have the impression that anybody who does not publish about them today is *passè i demodè.* Małkowski, Walecki and Ćwikła (Warsaw) assessed highly malignant NETs with vaguely convincing PET results when compared to somatostatin on receptor scanning (SRS).

PET/CT in radiotherapy planning; this was a presentation by Kobus-Błachnio et al. from Bydgoszcz — in patients with NSCLC, PET/CT caused rearrangement of irradiation areas in half of the patients. Very practical.

Paediatrics

Cholestasis in neonates; a group of Kamińska et al. from the Centre of Children's Health (CZD), Warsaw praised the superiority of cholescintigraphy with extraction fraction (HEF), over a sensitive but not very specific ultrasound examination.

Similarly hepatic clearances were advocated by Surma from Łódź, probably the leading expert in that field in Poland, who has been faithful to the subject for ages.

Again CZD; an interesting paper on cholescintigraphy in extrahepatic biliary tree cysts; a rare disease, therefore gathering an ample material of 68 patients is a good thing, but results could be more convincing (what were the results of reference methods?), perhaps comparing the image pre- and post-operation would make sense.

Changes of lung perfusion following Fallot tetralogy operations were shown by Romanowicz et al. from Gdańsk in a solid cohort of 110 patients, 60% of perfusion asymmetries, 40% of regional perfusion deficits, that's interesting, but what becomes of it in practice?

A nice paper on nephrotoxicity in leukaemia chemotherapy was given by Matacz, Zorga et al. A large group of patients with recommendation of dynamic renal scanning before and after chemotherapy; really? Chemotherapy slightly alters the morphology of kidneys, true, but what later? Too little for stable placement of this technique of the diagnostic algorithm. The group of Zawiślak et al from Łódź presented small local areas of decreased clearance renal function in diabetes. Interesting — kidneys lesioned piece by piece?

From the same centre, the next diabetological paper by Frieske, Kuśmierek et al., who analysed, with very impressive precision of statistical analysis, the usefulness of dynamic kidney scanning in the early stages of diabetic nephropathy, stating regional perfusion defects and the usefulness of parametric imaging, even at normal global parameters of kidney function. Important.

An interesting paper was presented by Kostkiewicz et al. from Cracow on the simple but practical problem of renal function pre- and post-renal angioplasties. Lots of interesting results. However, the observation period of 3 months seems to be too short, although in 2 patients re-stenosis has been shown already, after such a short period.

Radionuclide therapy

Peptides

As expected, lots of papers on DOTATATE with yttrium-90, peptides still on the top. Handkiewicz et al applied such therapy in 11 patients with NETs, remission in two, no progression in the rest: so far, so good. Another paper from Warsaw by Ćwikła et al. — 19 patients, with good visualisation of metastases resulting from *brehmsstrahlung.*

Bones

Strontium-89 and samarium-153, a comparison of treatment in prostate and breast carcinoma — solid material of 60 patients by Bączyk et al. from Poznań. In conclusion, samarium is better in osteolytic and mixed metastases, especially when bisphospho-

nates were added, a slightly static presentation, but an important vocal discussion on that type of treatment.

Thyroid

Thyroid, after 60 years of presence in nuclear medicine, is still a mysterious organ — that is the reason why I like it, we can speak about it again and again.

Kijek et al. (Lublin) precisely compared the results of treatment of hyperthyreosis and metabolism of I-131; radioiodine uptake and effective half decay with no influence in Graves' disease treatment — do we come back to the *fixed dose* treatment?

From the same centre: after the treatment, Trab and anti-TPO antibodies levels up? Already heard, I believe.

Radioiodine in subclinical hyperthyreosis — a problem raised by Abdelrazek et al. (Białystok). That is important, euthyreosis in 99%, although an observation time of one year is slightly too short.

Factors influencing hypothyreosis occurrence following toxic adenoma radioiodine treatment, by Listewnik et al., Szczecin, a solid meta-analysis, ho ho! They mixed and compared everything with everything, a very hard statistical work, as the main markers of the above seem adenoma's volume and radioiodine 24 hrs uptake.

Returning to the beautiful county of Bialystok, i.e. the realm of apoptosis. Sopotyk et al. indefatigably studied the level of pro- and anti-apoptotic markers, assuming that late hypothyreosis is a result of excessive apoptosis stimulation, with somewhat few conclusive results, perhaps it will be better with annexin-V imaging.

An interesting paper from Lublin. Stefaniak et al. applied neural networks in prognostication of radioiodine in toxic adenoma radioiodine treatment. Neural networks, i.e. the device (potentially) replacing the mind of a medical doctor, is a very *trendy* topic, at least at present. The authors show a very high utility of it in predicting efficacy, with some risk of falsely positive predictions. Lublin centre also gained great expertise in neural networks in other applications, its worth keeping an eye on their progress.

A very interesting paper was presented by Płazińska et al. from Warsaw on radioiodine therapy in haemodialysed patients. Simple, but nice. Retention of radioiodine is of course prolonged, and TEff highly dispersed, therefore administered radioiodine activities should be tailored to renal function parameters.

Thyroid carcinoma

Mediastinal radioiodine accumulation — the group Pisarska et al. from Kielce went through this problem in a very thorough way using a vast amount of material from 2000 patients, postulating an increase in administered radioiodine activity and applying the semiquantitative analysis of mediastinal uptake, as 1/3 of mediastinal metastases escape conventional scintigraphic radioiodine detection. Interesting and of practical value.

From the same centre: whole body radioiodine scintigraphy in multiple metastases of differentiated thyroid cancer, 455 patients; in lung metastases sensitivity 53%, specificity 100%, in bones 100% of both. Have I already heard this before?

Poznań centre, Macioszek et al studied the nonspecific I-131 accumulation in radioiodine whole-body scanning; delayed image acquisition doesn't help much, a very practical study.

Poznań again — Bączyk et al. are proud, and so they should be, of their results of radioiodine thyroid cancer treatment in a group of 1115 patients; perfectly detailed analysis, interesting three-fold increase of differentiated thyroid carcinoma detection in Poznan District in the last two decades.

Radiosynoviorthesis

A comparison of three methods: surgery, arthroscopic intervention and radiosynoviorthesis by the Gdynia group (Łuka et al.); in all three modalities equally good effects in a sound group of 300 patients with knee effusion — therefore, like in the famous meta-analysis on sentinel nodes by Paganelli… why pay more to gain the same, a solid voice advocating radiosynoviorthesis, pure and simple.

Inserting some general remarks: radiosynoviorthesis is one of the more pleasant adventures of Polish nuclear medicine in recent years - better late than never, stable methods, real gains for patients and the development of Polish NM.

The next three papers were on the same topic, from Białystok (Parfieńczyk et al.), Gdańsk (Romanowicz et al.) and Lublin (Chrapko et al.), the results were similar everywhere, the Lublin team were a bit more precise, in the Gdańsk paper there was correlation with knee joint ultrasound examinations, but few conclusions, after all. However, it is very nice that after years of stagnation in that field we can chase the international NM community.

Radiopharmacy and radioprotection

188-Re-HEDP; Korsak et al. did a sound job, but — sorry — rather an old topic? A presentation by Pawlak et al. on lutetium-177-EDTMP synthesis; they gained a high stability and radiochemical purity, but — excuse me — that lutetium-177 is somehow *unlucky.* Works on it last for years, but somehow cannot successfully compete with the saintly couple, strontium-89 — samarium-153.

We have the same problem with rhenium-188; its generator produced by Świerk centre, nice paper by Żuchlińska et al., and little makes little, clinical utilisation is progressing very slowly. By the way, the same problem is shared by metastable tin-117, phosphorus-33 and some others. Improvements in iodine-123 production by Bartyzel et al. from Cracow — important.

Radiopharmaceutical papers would be incomplete without the paper platinium (IV) complex with [*I] histamine as a radiopharmaceutical in radio-chemotherapy of neoplasms, modification of its structure improves biodistribution. The indefatigable group of Maurin and Garnuszek have been polishing that subject for years and I admire their faith to the idea.

Yttrium-90 and lutetium-177 as therapeutic agents — peptide labelling by Pawlak, Mikołajczak et al., standards good as gold, this is very important not only in the context of common NET--mania, but also for other therapeutic goals. Congratulations!

The possibilities of whole body scintigraphy in patients with administered beta-emitting radionuclides was presented with yttrium-90 as an example by Bajera from Warsaw — pure, simple and important. The author proves that *brehmsstrahlung* by Y-90 enables image registration, very important for dosimetry.

Radioprotection of patients and staff in radiopeptide therapy — the paper by Bilski et al from Military Medical Institute, Warsaw — is very important, when almost everybody in Polish NM wants

to do it. Speedy elimination with urine (75% of activity excreted within first 6 hrs post-injection); their postulate of building retention tanks everywhere, when radiopeptide therapy is applied is a) disputable; b) to be proven by stronger evidence.

Varia

OBRI/POLATOM with a paper on ophthalmic applicators of — 106-Ru and 125-I and 125-I in oncological brachytherapy, nice — I like OBRI!, laborious folks — but it is rather the domain of radiotherapy, not NM. Oczeretko et al. (Białystok) faithful for ages to Falk image analysis, which is nice. An interesting paper from Lublin by Stefaniak et al. on a phantom for simulated brain SPECT analysis; hard and solid job, unexpectedly better results in FBP than ITW image reconstruction. It's good that such a paper has been presented, it's a shame that only two groups in Poland — Lublin team + Bandurski & Świetlik in Gdańsk — work in the frontier of nuclear medicine and computer sciences.

Concluding remarks, i.e. good and bad news

Good news

Good news — things are getting better! The author of this presentation has witnessed the Polish Nuclear Medicine Society Congresses since their beginning, i.e. almost 20 years ago, and, by Jove, it's better in two/three areas! e.g. in NETs and radiopharmacy, the quality of papers is definitely better, quite a lot PET papers; some promising flashes in RN coronary disease studies, but...

Bad news

We are not only losing contact with top world nuclear medicine; I believe we, as a community have already lost it! For some time, in *niche* areas, a good concept, daring thought and laboriousness were good enough — today this is no longer true. This was proven by the recent 2005 Constantinople EANM Congress or the lectures of any issue of EJNM&MI. 75% of papers either on PET or the new tracers, the names of which sound like science fiction movies to our ears; PET presentations are in the poster sessions, and we can only dream about new software — like HERMES on NM image analysis, for financial reasons.

We are chasing — with little effect — not only the world nuclear medicine community, but the Polish NM community looses when compared even with our neighbours, I am speaking not only about Germany (2.800 gamma-cameras, 80 PET units), I am speaking also about the Czech Republic (1.5 × higher Gross National Product, but 6% of it given to health care, not 3.6% as in Poland), I am speaking about Hungary, where quantity goes into quality. In Poland the simple reserves in NM are finished, therefore, in the amount of presentation in EANM congresses, we are lower.

Concluding remarks, i.e. how to survive, when no miracles exist

Let's work together, ladies and gentlemen. Our chance is multicentric cooperation, which has succeeded in NETs, also something which largely disappeared in comparison with previous Polish SNM congresses i.e. papers ensuing from international cooperation.