EuroSciCon

DAY 1

Scientific Tracks & Abstracts

International Conference on

Nuclear Medicine & Radiation Therapy

October 01-02, 2018 | Stockholm, Sweden

DAY 1

October 01, 2018

Sessions

Nuclear Medicine| Radiology | Radiation Therapy | Functinal Imaging | Radiopharmaceuticals | Radiation Dosimetry | Oral Radiology | Radiography | Roles & Importance of Nuclear Medicine | Limitation of Nuclear Medicine

Session Chair
C. J. Palestro
Donald & Barbara Zucker School of Medicine, USA

Session CO-Chair
Golam Abu Zakaria
University of Cologne, Germany

Session Introduction

Title: The role of nuclear medicine in prostate cancer imaging, treatment and surgery
Marcel P.M. Stokkel, Netherlands Cancer Institute, The Netherlands

Title: Radiolabeled drugs and PET imaging for personalized medicine
N.H. Hendrikse, VU University Medical Center, The Netherlands

Title: Production of radiopharmaceuticals suitable aiding radiotherapy planning
Pal Mikecz, Kaposi Mor Teaching Hospital, Medicopus Non-profit Ltd. Kaposvar, Hungary

Title: Analysing the impact of size of brain metastases in the overall survival of patients with primary head and neck cancer, melanoma and sarcoma
Antonio Manuel da Silva Ribeiro Mota, Instituto Portugues de Oncologia de Lisboa Francisco Gentil (IPOLFG), Portugal

Title: EPR protocol for dose delivery in radiotherapy/radiosurgery
Catalin Stelian Tuta, Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Romania

Title: PET radiopharmaceuticals production facilities, planning and operation challenges
Tamer B Bayomy, International Medical Centre, Egypt

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Marcel P M Stokkel et al., J. med phys & appl sci 2018, Volume: 3
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THE ROLE OF NUCLEAR MEDICINE IN PROSTATE CANCER IMAGING, TREATMENT AND SURGERY

Marcel P M Stokkel, Judith Olde Heuvel and Linda de Wit van de Veen
Netherlands Cancer Institute, The Netherlands

Over the past year, prostate cancer imaging and staging with gallium-68 prostate specific membrane antigen (^{68}Ga-PSMA) PET/CT has been introduced in clinical practice. The higher sensitivity and specificity compared with C11-choline or other tracers even at low PSA levels have been shown in many papers. Also in high risk patients, ^{68}Ga-PSMA PET/CT is increasingly used demonstrating additional value prior to surgery. Although the additional value still has to be established, its role in oncological setting is growing. The same carrier (PSMA) can be used in clinical practice for hormone refractory prostate cancer treatment by labelling it with lutethium-177 (^{177}Lu), a beta-emitting radionuclide. An overview will be given on the diagnostic and therapeutic value in prostate cancer. A new application ^{68}Ga-PSMA, the intra-operative evaluation of prostatectomy margins, has recently been granted by KWF-STW. This evaluation is based on the emission of Cerenkov light, which is a side-effect of the emission of protons from ^{68}Ga. This blue light is emitted from tumors that are not completely resected during surgery, whereas in radically resected tumors this light will be attenuated from normal tissue surrounding the primary tumor. A technical evaluation of this technique is presented and the introduction into clinical practice is described. The latest development in image guided surgery is the introduction of technetium-99m PSMA (^{99}mTc-PSMA). By using this technique, it might become possible to pre-operatively image prostate cancer metastases in loco-regional lymph nodes and to detect these nodes during surgery using standard probes. It is expected to gain a role in lymph node metastases with a diameter >5mm. In smaller lesions, its role is not clear yet. In this respect, a standard sentinel node procedure is available to image and detect lymph nodes at risk for metastatic disease. All procedures will be discussed during this presentation, high lighting the increasing role of nuclear medicine in cancer staging and treatment.

Biography

Marcel Stokkel is a Nuclear Medicine Physician since 1997 and has completed his PhD in 1999. He is Head of the Department of Nuclear Medicine and Head of the division of Diagnostic Oncology of the Netherlands Cancer Insititute–Antoni van Leeuwenhoek Hosptial. In addition, he is Chair of the Netherlands Society of Nuclear Medicine. He has published almost 200 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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RADIOLABELED DRUGS AND PET IMAGING FOR PERSONALIZED MEDICINE

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Therapeutic advances in cancer care have revolutionized the oncological landscape. One of the major advancements in this regard is owed to the development of targeted drug therapies. However, for successful clinical treatment of cancer patients with these drugs, proper identification of target (e.g. receptor) expression is essential. To have knowledge about target expression, tumour biopsies have to be obtained, which is often limited by practical issues, including the inability to reach the tumour, low yields of malignant tumour cells, or tumour heterogeneity. Positron emission tomography (PET), a powerful and accessible imaging technique, enables to overcome these limitations. PET can visualize and quantify tumour specific uptake of radiolabelled targeting drugs, allowing for characterization of their pharmacological and pharmacokinetic behaviour. For visualization tumour targeting with PET, tyrosine kinase inhibitors (TKIs) and monoclonal antibodies (mAbs) are most frequently used therapies. Due to receptor mutations in tumour tissue, the affinity of drugs for receptors may change, often resulting in limited clinical response. Therefore, to select the best drug for treatment for each patient, we radioactively labelled several TKIs and mAbs that are in clinical use and performed PET studies to determine pharmacological parameters, including receptor binding. PET also plays an important role to optimize dose schemes in treatment of cancer patients. Cancer patients mostly use different drugs simultaneously. Optimization of co-administration of drugs is essential for successful tumour treatment. Several examples demonstrating the role of quantitative PET imaging for receptor expression and mutation in tumour tissue, but also optimization of chemotherapeutic dose schemes will be discussed. Microdosing-PET provides a means for optimizing drug treatment in individual cancer patients, and as such would be an important step towards personalized medicine.

Biography

Harry Hendrikse has studied Pharmacy at the State University of Utrecht (Pharm D). He completed his PhD at the State University Groningen (The Netherlands) by measuring MDR in tumour tissue using positron emission tomography (PET). Subsequently he was Postdoctoral Fellow at the PET Center of the University of Washington Medical Center (Seattle, USA). He has specialized as Hospital Pharmacist and Clinical Pharmacologist at the University Hospital Groningen (UMCG) where he worked for more than 10 years. Now he is working at VU University Medical Center Amsterdam (VUmc) where he is Staff Member of the Departments of Clinical Pharmacology and Pharmacy, Radiology and Nuclear Medicine. He is also Professor in Clinical Radiopharmacology VU University Medical Center Amsterdam. He focusses on Labelling and Clinical PET Evaluation of Small Molecules and Monoclonal Antibodies in Oncology. He has published many peer reviewed manuscripts. He is a (Board) Member of several scientific (inter)national programs and Member of the Editorial Board of several scientific journals.

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PRODUCTION OF RADIOPHARMACEUTICALS SUITABLE AIDING RADIOTHERAPY PLANNING

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Positron emission tomography (PET) could significantly improve the radiation therapy planning by increasing the targeting accuracy and therapeutic efficacy of the delivered radiation. Since this method gives information of the biochemistry of tissues, it should be a necessary supplement to the anatomical imaging methods such as CT or MRI. The main advantage is its ability in image metabolism, apoptosis, proliferation, cellular transporters, cell receptors, oxygen availability, gene expression and cell kinetics, non-invasively in living subjects at multiple time points. Besides the 2-[fluorine-18] fluoro-2-deoxy-D-glucose (FDG), the most often applied radiopharmaceutical, there are several other well established but much less used tracers. The use of other tracers is often hindered by price and the lack of availability of these tracers. The second most frequently used tracer family is the fluorine-18 or carbon-11 labelled amino acids like [11C] methionine, [^{18}F] Fluoro (methyl or ethyl) tyrosine or even [^{18}F] FDOPA (fluorodopa). The carbon-11 and fluorine-18 labelled choline analogues could be useful in prostate tumour metastases or in some cases in gliomas. Since hypoxic tumour cells are relatively resistant to radiation and would be more likely to be controlled if a higher radiation dose could be accurately targeted at regions of imaged hypoxia with [^{18}F] FMISO (fluoromisonidazole) or [^{18}F] FAZA (Fluoroazomycin arabinoside). The ideal radionuclide for PET imaging is fluorine-18 due to its ideal nuclear properties. Application of other nuclides is always call for compromise in image quality. The acceptance of the radiopharmaceuticals by the end users, i.e., clinicians and the patients is important, however, the approval by the national regulatory agency and above all reimbursement for the particular clinical indication are critical factors that determine the success of a scientifically useful molecular imaging agent. Recently in Hungary there are four tracers that are available for human applications. Their use for radiation therapy planning so far was not commenced.

Biography

Pal Mikecz has received his University Doctoral Degree in 1988 based on the work of Production Methods of Medically Important Radioisotopes which was conducted in Joint Nuclear Research Institute in Dubna. Since then, he had participated in establishment and running a few PET radiochemistry laboratories in Hungary, Scotland, Poland and Germany. He has recently retired from the University of Debrecen. He is Senior Advisor for the Radiochemistry Laboratory of the newest Hungarian PET centre at the Kaposi Mór Teaching Hospital in Kaposvár. He had participated in several IAEA mission as an Expert in the field of PET Radiochemistry. He has published more than 50 papers in reputed journals with 500+ citations and has been serving as Reviewer of many articles.

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ANALYSING THE IMPACT OF SIZE OF BRAIN METASTASES IN THE OVERALL SURVIVAL OF PATIENTS WITH PRIMARY HEAD AND NECK CANCER, MELANOMA AND SARCOMA

Antonio Manuel da Silva Ribeiro Mota[1, 2], RoldaoM[1,2], Silva P[1], Pedro C[1], Ferreira N[1], Fonseca J[1], Viveiros C[1], Fonseca L[1], Colaco R[1], Matos A[1], Netto E[1,2] and Santos F[1]

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[2]Nova Medical School, Portugal

Introduction: Management of brain metastases (BMs) depends on important prognostic factors such as age, performance status (PS), primary cancer and the status of extracranial disease. Until now, the size of brain metastasis (BM) is used to decide the therapeutic approach but not as a prognostic factor.

Methods: A retrospective and single center study of patients having primary head and neck cancer, melanoma or sarcoma who were diagnosed of BMs from 2006 to 2015 was analysed. Patients were selected by number of BMs (≥4) and/or by size of the biggest BM (≥3cm). The primary outcome was to evaluate the association between the size of BM and overall survival (OS) in months, and the second outcome was to evaluate the association between whole brain radiotherapy (WBRT) and OS in months. We compared the association by baselines covariates using log-rank test and Cox proportional hazards regression.

Results: 66 patients were collected (median age 63 years old) with primary head and neck cancer, melanoma or sarcoma. In univariate analysis, there was no difference in OS between gender, number of BMs and primary cancer. However, there was a statistical difference in OS when the diameter of the biggest metastasis is ≥3cm (difference in median OS=1.3 months, $p<0.05$). There was also an increase in OS among patients treated with WBRT (difference in median OS=2.5 months, $p<0.05$). In a multivariate analysis, there was no difference in association between the size of BM and OS (Hazard Ratio (HR) = 1.6, 95% CI: 0.82-3.2), p=0.16)

Conclusion: This retrospective study shows no association between BMs' size and OS in patients with primary head and neck cancer, melanoma or sarcoma. However, in this cohort, WBRT improves OS in the group of patients with ≥4 BMs and/or one BM≥3cm.

Biography

António Manuel da Silva Ribeiro Mota has completed his MSc in Medicine from Nova Medical School and finished his Residency in Radiation Oncology from Instituto Português de Oncologia de Lisboa Francisco Gentil in 2015 with the grade of 19.5/20.0 He has undergone a professional training at Mount Vernon Cancer in London in 2014, to improve his knowledge in Radiation Oncology. He has completed his Clinical Scholars Research Training (CSRT) from Harvard Medical School in 2018. Currently, he is associated with Nova Medical School for the Oncology studies and Volunteer Assistant with students from the 5th year of MSc studies. He has published two papers in journals and presented several oral communications in congress and symposium. His area of interest includes Central Nervous System, Hematology and Head and Neck cancer.

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EPR PROTOCOL FOR DOSE DELIVERY IN RADIOTHERAPY/RADIOSURGERY

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There are four million new cases of cancer per year, and the number of treatments is also increasing due to diagnostic improvements and an ageing population. The goal of radiotherapy/radiosurgery is to kill the tumour cells and simultaneously achieve a high survival rate of the surrounding healthy tissue. A 5% change in the dose can result in normal tissue complication probability of 20%-30%. However, the uncertainty requirement for the dose to the tumour (2.5% ICRU) is not achieved due the gap between the calibration conditions and the conditions used for new treatment modalities based on small and complex radiation fields. Electron paramagnetic resonance (EPR)/electron spin resonance (ESR) spectroscopy is a suitable method for radiation dosimetry due to its accuracy, sensitivity and non-destructive measuring procedure. Materials in which stable paramagnetic species are produced by irradiation can be used as EPR dosimeters for radiation research. When the relationship between EPR signal intensity of stable paramagnetic centre and the dose is of linear character over a wide dose range, the material can be used as a good dosimeter. The amino acid alanine (CH_3 (NH_2)-CH-COOH) is one of the most standardized organic materials for fabrication of dosimeters. The alanine dosimeters are used in biomedical applications due to the similarity with human tissues. Alanine dosimeters are small, compact and quite easy to handle. They are characterized by low influence of dose rate as well as a wide measuring dose range, which makes them applicable for radiation therapy in the ~5-100 Gy dose range where the measured signal is proportional to the absorbed dose. In this paper, an optimisation of the operational parameters of the EPR spectrometer was performed in order to determine the range of doses used in radiotherapy/radiosurgery using alanine dosimeters system and as a result, a new improved protocol was developed.

Biography

Catalin Stelian Tuta has completed his PhD from Faculty of Chemistry, University of Bucharest. Currently, he is working as a Scientific Officer at National Institute of Physics and Nuclear Engineering (IFIN-HH). He has published more than 10 papers in various scientific journals.

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PET RADIOPHARMACEUTICALS PRODUCTION FACILITIES, PLANNING AND OPERATION CHALLENGES

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Cyclotron facilities are relatively long lived solutions. Having a production facility complying with the international standards of good manufacturing practice (GMP) can be only achieved by a well-planed road map. The scope of services provided by the facility and how much it is incorporated in the national research and production activities is defining how it should be planned and operated. The production facility can't be limited only to the cyclotron products but should be designed to accommodate all PET and some SPECT radionuclide production technologies to act as a central nuclear pharmacy for the local area.

Biography

Tamer B Bayomy has completed his PhD from Cairo University. He was serving as an Expert /Lecturer for the IAEA since 2010. He was granted as a Member of the American Board in Radiopharmacy in June 2014. He is the Head of the Cyclotron Department, International Medical Centre, Cairo, Egypt since 2016. He worked as the Head of Cyclotron in King Hamad University Hospital, Bahrain from 2012 to 2016. He also has worked as Senior Radiopharmacist and an Acting Cyclotron Head (2005-2012) in King Fahd Specialist Hospital, Saudi Arabia.

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DAY 2

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DAY 2

October 02, 2018

Sessions

Nuclear Medicine| Oral Radiology | Radiography | Roles & Importance of Nuclear Medicine | Limitation of Nuclear Medicine| Quantitative SPECT Imaging | Nuclear Medicine Working

Session Chair
C. J. Palestro
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Session CO-Chair
Golam Abu Zakaria
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Session Introduction

Title: Combining IMRT and DIBH for the treatment of mediastinal lymphomas: What's the benefit?
Antonio Manuel da Silva Ribeiro Mota, Instituto Portugues de Oncologia de Lisboa Francisco Gentil (IPOLFG), Portugal

Title: Nuclear medicine imaging: Effective cost saving of radio tracers
Evbuomwan Osayande, University of the Witwatersrand, South Africa

Title: PET-CT application for adjustment of thyroid cancer treatment algorithm
Olena Oliinichenko, Kyiv Municipal Clinical Oncology Center, Ukraine

Title: Dosimetry of small photon radiation fields: comparison of the German DIN-6809 (2016) and the IAEA TRS- 483 (2017) protocols
Golam Abu Zakaria, University of Cologne, Germany

Title: Quality of life and suicidal ideation among patients with well differentiated thyroid carcinoma undergoing radioactive I-131 therapy at Perpetual Succour Hospital, Cebu City for the year 2018
Junjie N. Caber, Perpetual Succour Hospital, Philippines
Charles Tan, Perpetual Succour Hospital, Philippines

Title: Current trends in PET radiopharmacy, diagnostic and therapeutic applications
Tamer B Bayomy, International Medical Centre, Egypt

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COMBINING IMRT AND DIBH FOR THE TREATMENT OF MEDIASTINAL LYMPHOMAS: WHAT'S THE BENEFIT?

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Background: Radiotherapy plays an important role in the treatment of Hodgkin lymphoma (HL). However, long term survivors treated with mediastinal RT have an increased risk for the development of cardiovascular disease and secondary cancers. Efforts have been made to reduce the rates of late toxicity and promising results have been published with intensity modulated radiation therapy (IMRT) and deep inspiration breath-hold (DIBH). Patients with HL are often young with good respiratory function, enabling the use of DIBH.

Objective: To evaluate the potential benefit of combining IMRT with DIBH to decrease cardiac and lung dose in mediastinal RT.

Material & Methods: Three patients with cervical and mediastinal lymphoma involvement received involved site radiotherapy (ISRT) with 30 Gy in 15 fractions. Each patient underwent a planning CT scan in free-breathing (FB) and DIBH using a 5 point thermoplastic mask. IMRT plans for FB and DIBH were created and compared with respect to PTV coverage and doses to organs at risk.

Results: Patient 1 had a large PTV volume extending downwards into the anterior mediastinum reaching the cardiofrenic space while patients 2 and 3 had disease only on the upper mediastinum. Mean heart dose was lower with DIBH in all patients (~22-52%). Greater lung expansion was achieved with DIBH which contributed to lower mean lung doses (~14-18%) and lung V20 (~20-28%). Higher absolute decreases on mean heart and lung doses were seen on patient 1. PTV coverage (D95, V95) was similar for both plans in all patients. DIBH-IMRT was chosen for treatment delivery on patients 1 and 2.

Discussion: Significant decreases on heart and lung doses can be achieved while not comprising PTV coverage. Patient anatomy and disease extension will determine the degree of dosimetric improvement when using DIBH. Also, appropriate patient compliance is essential to perform DIBH.

Conclusion: Combining DIBH and IMRT can significantly improve doses on heart and lung when using mediastinal RT and thus reduce long-term morbidity. Choice between treatment delivery techniques should be made on an individualized basis.

	Patient 1			Patient 2			Patient 3		
	FB	DIBH	Δ	FB	DIBH	Δ	FB	DIBH	Δ
Mean heart dose (Gy)	15.1	11.8	-22% -3.3Gy	2.5	1.2	-52% -1.3Gy	2.6	1.9	-26% -0.7Gy
Mean lung dose (Gy)	13.9	11.6	-17% -2.3Gy	8.3	6.8	-18% -1.5Gy	8.3	7.1	-14% -1.2Gy
Lung V20 (%)	19.1	13.7	-28%	12.7	10.2	-20%	14.5	10.4	-28%
Lung Volume (cc)	2461	5329	+102%	3315	4061	+23%	2437	3944	+62%

Biography

João António Maia Garcia Fonseca is a Medical Doctor and has completed his studies in Nova Medical School Lisbon in 2014. He is currently in his last year of Residency in Radiation Oncology at Instituto Português de Oncologia de Lisboa which began in 2015. Over the past years, he has presented several posters and oral communications in both national and international conferences. In 2018, he presented poster in ESTRO 37 and 20th ESMO World Gastrointestinal Congress.

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NUCLEAR MEDICINE IMAGING – EFFECTIVE COST SAVING OF RADIO TRACERS

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There are FDA approved radiopharmaceuticals for various nuclear medicine imaging procedures. Examples will include 99mTc DTPA as a radioaerosol for ventilation studies and 99mTc sulphur colloid for milk scans. We now live in the era of health economics and it has become essential for resource constraint facilities to develop means to save cost while maintaining acceptable standards. The use of one radiopharmaceutical for different nuclear medicine studies for example may offer opportunities to do so.

Aim: To show how radiopharmaceuticals may be used cost-effectively in a busy nuclear medicine practice.

Methods: We looked at two studies that have been conducted in our facility over the last 2 years. One was a randomized prospective study where 99mTc MDP and MIBI were compared with 99mTc DTPA for lung ventilation scintigraphy in patients with suspected pulmonary embolism. The second study was a retrospective study were 99mTc nanocolloid was used in place of 99mTc sulphur colloid for performing milk scans.

Results and Conclusion: The alternative agents in both studies were shown to be cost saving to the department with good quality images. 99mTc MIBI was also shown to be a better radioaerosol for ventilation when compared to 99mTcDTPA. Spare doses drawn up from a vial being used for myocardial perfusion imaging can be used for ventilation scintigraphy. Spare doses of 99mTc nanocolloid drawn up from a vial being used for lymphoscintigraphy, sentinel lymph node mapping or bone marrow imaging can be used for performing milk scans.

Biography

Dr Evbuomwan has completed his masters in medicine (MMED, Nuclear medicine) from the University of the Witwatersrand, Johannesburg, South Africa. He is currently a nuclear medicine specialist practicing in Charlotte Maxeke Johannesburg Academic Hospital. He has published lots of papers in reputed journals. He is also a presenter in both local and international conferences and a reviewer for high impact journals.

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PET-CT APPLICATION FOR ADJUSTMENT OF THYROID CANCER TREATMENT ALGORITHM

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[2]Kyiv Municipal Clinical Oncology Center, Ukraine

Case-records of 10 patients with an average of 54 years have been analyzed taking into account the ability of PET/CT to provide information on tumor biology, its metastases and prognostic factors. Among them nine were females and one was male. PET/CT was applied to decide on possibility to conduct primary or repetitive iodine therapy courses. There were two cases of mixed medullary follicular carcinoma, one case of mixed medullary papillary carcinoma and one case of follicular papillary carcinoma with medullary lesion. Only one patient within this group has been approved for repetitive iodine therapy courses after investigation with PET/CT. Four patients had prolongation suspicion and resistance to radioactive iodine: two of them with growing level of thyroglobulin 135.3 and 532.0 ng/mL registered during the year and additional new lesions detected by CT and two with stably elevated level of thyroglobulin 8.4-8.9 ng/L and 9.3-9.8 ng/L during two years of monitoring. All of them had negative iodine scans. Investigation has detected high level of standard uptake value (SUV) from eight to 24 in patients with high level of thyroglobulin. Consequently, iodine therapy was not planned for these patients. Results of instrumental examinations proved no foci in patients with stably elevated level of thyroglobulin; additionally no pathological uptake of 18F-FDG has been registered. In two patients with the following primary diagnosis: poorly differentiated adenocarcinoma, syndrome of neck tumor compression and medullary carcinoma with metastatic lesions of lymph nodes, PET/CT has been applied to detect additional lesions and their metabolic activity (in lungs and lymph nodes with SUV>9). Outcome of PET/CT application: the investigation enabled adjustment of treatment algorithm in five patients and was useful as a prognostic tool in other patients.

Biography

Olena Oliinichenko has studied in Bogomolets National Medical University, Kyiv and graduated in 2009. She has completed her Internship in Radiology from Bogomolets National SMedical University in 2011 and special training courses in Nuclear Medicine in P L Shupyk National Medical Academy of Postgraduate Education (NMAPE) in 2011. She worked as a Radiologist in Radiotherapy department of Kyiv Municipal Clinical Oncology Centre (2009-2011). She worked as a Nuclear Medicine Physician until now and currently she holds the position of Head of PET/CT department in Centre of Nuclear Medicine of Kyiv Municipal Clinical Oncology Centre. She is a Member of EANM, IASLC. She has completed several trainings by IAEA. She has published fifteen papers in core Ukrainian and several international journals.

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DOSIMETRY OF SMALL PHOTON RADIATION FIELDS: COMPARISON OF THE GERMAN DIN-6809 (2016) AND THE IAEA TRS- 483 (2017) PROTOCOLS

Golam Abu Zakaria

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Modern radiation techniques such as stereotactic radiosurgery and intensity modulated radiation therapy (IMRT) use small radiation fields (field sizes <2x2 cm2), which deviate significantly from the dosimetric reference field size 10x10 cm2. Small photon field dosimetry requires further development of today's codes of practice, because of the changing physical conditions. The resulting changes in physical and dosimetric conditions go beyond the measuring methods defined in the popular standard protocols like IAEA TRS-398, German DIN 6800-2, and AAMP TG-51. For this reason, the German standard DIN 6809-8 (2016) and the international IAEA TRS-483 (2017) protocols have recently been developed. They define the measuring methods and physical parameters of dosimetry of small photon fields. The IAEA TRS-483 protocol is an extension of the Codes of Practice TRS-378 based on the basic work of Alfonso et al. Similarly the standard DIN 6809-8 is an extension of the DIN 6800-2 for small field. The content of the DIN 6809-8 standard is, among others, the introduction of a new reference field size to ensure an adaptation to the conditions of the small photon fields. It is defined as the small calibration field. Furthermore, correction values are recommended which correct the influence of the detectors on the measured value when measured field sizes are smaller than the small calibration field. In this norm, the detector-dependent correction factors are based on the formalism of Alfonso et al. The DIN 6809-8 is a suitable recommendation for small field dosimetry and ensures the alignment of the Codes of practice. The principles of determination of the absorbed dose in water according to both protocols and a comparison of results for different high energy photon beams are explained in this paper.

Biography

Prof. Dr. G. A. Zakaria studied physics at the University of Halle-Wittenberg in 1978, and post-graduated at the University of Goettingen and received his Ph. D in medical physics at Heidelberg University, Germany.

Prof. Zakaria is currently the chairman of the Department of Medical Radiation Physics at Gummersbach Teaching Hospital of the University of Cologne and professor of Biomedical Engineering at the University of Applied Sciences in Koethen. Furthermore he has been invited as Guest/honorary/adjunct professor in many institutes or universities in Germany, Italy, China and Bangladesh. Since January 2018, Dr. Zakaria is nominated as the Accreditation Committee-2 Chair (Radio-Oncology Physics) of the International Medical Physics Certification Board (IMPCB).

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QUALITY OF LIFE AND SUICIDAL IDEATION AMONG PATIENTS WITH WELL DIFFERENTIATED THYROID CARCINOMA UNDERGOING RADIOACTIVE I-131 THERAPY AT PERPETUAL SUCCOUR HOSPITAL, CEBU CITY FOR THE YEAR 2018

Junjie Neri Caber, Charles S Tan and Ian Fruto G Teodorico
Perpetual Succour Hospital, Philippines

Objective: This descriptive co-relational study aimed to determine the quality of life of patients with well differentiated thyroid carcinoma undergoing radioactive iodine (I-131) therapy and their suicidal ideation at Perpetual Succour Hospital for the year 2018.

Method: The subjects of the study with well differentiated thyroid carcinoma comprising the entire group and classified as to: age, sex, civil status, educational attainment, work status, stage of cancer and co-morbid conditions. The data gathered were subjected to descriptive and inferential statistics set at 5% level of significance.

Result: The level of cancer and the socio-demographic profiles of the respondents indicated that at least one of the predictors in the model has a statistically significant association with a higher level of cancer. In particular, only age is statistically significant at the significance level of 0.05. Since the coefficient is positive, it indicates that a higher level cancer becomes more likely as the age increases. The odd ratio also indicates that for every one year the patient grows the likelihood of a higher level cancer is increased by 1.12 times. The overall level of the Quality of Life of the respondents in terms of psychological, physical, emotional, social and financial is good. While the respondent's level of suicidal ideation in terms of psychological and emotional is low. Moreover, marital status is observed to be statistically significant. Finally, co-relational analysis of quality of life and the suicidal ideation of the respondents show that the correlation coefficient is statistically significant at the significance level of 0.05. The coefficient suggests a moderate negative relationship.

Conclusion: This study proved that once the patient is diagnosed with cancer, changes in the age are associated with changes in the probability of the severity of the cancer by 1.12 times. The quality of life differs among statuses. The respondents who are married have better quality of life compared with the others, while separated ones have poorer life quality. Lastly, the study proved that the better the quality of life, the less likely for the patients to commit suicide.

Biography

Junjie Neri Caber is the Radiation Safety Officer and the Chief Nuclear Medicine Technologist at Perpetual Succour Hospital, Cebu City, Philippines. She was the President of the Philippine Society of Nuclear Medicine Technologist Cebu Chapter. She is a Licensed Medical Technologist by the Philippine Board and licensed by the American Society of Clinical Pathology International. She has obtained her Bachelor of Science in Medical Technology at South-western University Cebu City, Philippines in 2006. She finished her Postgraduate course with a degree Master of Public Health. Furthermore, she obtained her Distance Assisted Online Training course to all Nuclear Medicine Technologist through International Atomic Energy Agency (IAEA) and Philippine Nuclear Research Institute (PNRI) in 2015. Currently, she is working on her PhD in Education major in Research and Evaluation at Cebu Normal University, Cebu City, Philippines.

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CURRENT TRENDS IN PET RADIOPHARMACY, DIAGNOSTIC & THERAPEUTIC APPLICATIONS

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PET radiopharmaceuticals are extensively used all over the world for different diagnostic and therapeutic applications. Although ^{18}F-FDG is the most common tracer being used in PET diagnosis, many other cyclotron and generator produced radiopharmaceuticals are dragging more attention to cover the known limitations of FDG. Theranostics are trending now as a successful combination of a predictive biomarker with a therapeutic agent that showing confident achievements in specific targeted therapy.

Biography

Dr. Tamer has completed his PhD at the age of 33 years from Cairo University. He is an Expert / Lecturer for the IAEA since 2010. He was granted the American Board in Radiopharmacy in June 2014. He is the head of the Cyclotron Department, International Medical Centre, Cairo, Egypt from 2016 till now. He worked as the Head of Cyclotron in King Hamad University Hospital, Bahrain from 2012 to 2016. Worked as Senior Radiopharmacist and acting cyclotron head in King Fahd Specialist Hospital, Dammam, Saudi Arabia from 2005 to 2012.

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DAY 2

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RADIOPROTECTIVE PROPERTIES OF THE ANTI-CANCER PREPARATION NSC-631570 (UKRAIN)

Wassil Nowicky
Nowicky Pharma/ Ukrainian Anti-Cancer Institute, Austria

When NSC-631570 has been used in clinic, it was observed that the patients treated with this drug tolerate the concomitant radiotherapy much better. The adverse effects of this aggressive treatment modality were significantly reduced to minimal. This gave reason to study radioprotective properties of NSC 631570 in the *in vitro* and *in vivo* tests. It was proven the radioprotective effect of NSC 631570 was far superior compared to such of its raw materials taken separately, both measured by survival of mice irradiated by different doses and by the protection coefficient. For example, at a dose of 5.25 Gy, protection coefficient of NSC 631570 was 95.0±4.6 vs 50.8±4.6 in the control. These observations suggested that the radio protective effect of UKRAIN differs significantly from such of its raw material. NSC 631570 was effective in the therapy of recurring respiratory diseases in children from the Chernobyl area. A total of 38 children from areas of radiation contaminated after the chernobyl accident and suffering from recurrent respiratory diseases were included into the study. UKRAIN was administered intravenously at a dose of 5 mg twice a week, up to a total dose of 35 mg. The control group received standard therapy. In the UKRAIN treated group marked anti inflammatory effect was revealed compared to the control: normalisation of WBC count and blood sedimentation rate. The immune modulating effect of UKRAIN was indicated through the improvement in specific humoral and cellular immunity: increased the IgG concentration, the phagocytic activity of neutrophils, the number of total lymphocytes, Tlymphocytes and Thelpers, and the helpers/suppressors ratio.

Biography

Wassil Nowicky (Dipl Ing, Dr techn, DDD rh c) is the Director of Nowicky Pharma and President of the Ukrainian Anti-Cancer Institute (Vienna, Austria). He is the Inventor of NSC-631570, the anticancer preparation on basis of celandine alkaloids. He is the Author of over 300 scientific articles dedicated to cancer research. He is a real Member of the New York Academy of Sciences, Member of the European Union for applied immunology and of the American Association for scientific progress, honorary Doctor of the Yanka Kupala State University of Grodno, doctor *Honoris Causa* of the Open International University for Complementary Medicine in Colombo, Honorary Member of the Austrian Society on the Name of Albert Schweizer. He has received merits of National Guild of the award of Austrian Society of sanitary, hygiene and public health services and others.

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BREAST CARCINOMA: IMPACT OF RESPIRATORY GATING IN CARDIAC DOSE REDUCTION

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Introduction: There is evidence of the importance of dose reduction on the heart due to the association between mean heart dose (Mean HD) and major coronary events in patients who underwent adjuvant radiotherapy for early breast cancer of the left breast (EBCLB). Efforts have been made to reduce the rates of late toxicity and respiratory gating techniques, especially deep inspiration breath hold (DIBH) has shown promising results.

Objectives: Quantify and compare Mean HD and maximum heart dose (Maximum HD) in EBCLB patients using deep inspiration breath-hold (DIBH) vs free breathing (FB). Evaluate the presence of major adverse cardiovascular events (MACE).

Materials & Methods: From 13th Oct' 2016 to 30th Jun' 2018, 14 patients with EBCLB underwent planning CT scans with FB and DIBH, using real-time position management system. Both scans were used for planning and two dosimetries were generated to evaluate Mean HD and Maximum HD for each patient. MACE was evaluated trough the observation of hospital records.

Results: 14 women with the median age of 57 years underwent external beam radiation therapy with conventional fractionation (median dose 60Gy), the comparison of DIBH and FB plans showed a reduction on mean HD (3.7 Gy vs 7.1 Gy) and Maximum HD (40.7 Gy vs 49.5 Gy). MACE was evaluated in 10 patients, no MACE was observed; the median follow up was till 16 months.

Discussion: The observed reductions in mean HD and maximum HD can be explained by the displacement of the treated volume relative to the heart. According to published data, the 3.4 Gy reductions in the mean HD represent a reduction in the risk of MACE of 25.2%. MACE events were not recorded in this sample; however a longer follow up is necessary to evaluate the impact of these cardiac dose reductions.

Conclusion: The use of DIBH on EBC has shown a significant reduction on the mean HD and maximum HD. The observed results may contribute to a decrease in the probability of MACE.

Biography

Raul da Silva Colaço is a Medical Doctor and has completed his studies at Nova Medical School Lisbon in 2015. He is currently in his second year of Residency in Radiation Oncology at Instituto Português de Oncologia which began in 2017. Over the past years, he has presented several posters and oral communications in national conferences.

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