OP-386

Feasibility study of applying ICRP biokinetic models for pharmacokinetic modelling of alpha-emitter thorium-227 used in targeted radionuclide therapy

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Aim: Targeted radionuclide therapy with Th-227 conjugated with novel antibodies, e.g. CD33 and CD70 has been pre-clinically used for treatment of myeloid leukaemia and renal cell carcinoma, respectively. Furthermore, PSMA-targeted Th-227 conjugate PSMA-TTC was recently developed for preclinical pharmacological study of treatment of prostate cancer. The imaging of alpha-emitter labelled radiopharmaceuticals in clinical practice is challenging. Therefore theoretical modelling of bio-distributions of Th-227 and its immediate decay product Ra-223 and other progeny is highly desired. Especially radiolabelled metabolites or unconjugated daughters may lead to toxicity but also might be beneficial in the case of unconjugated Ra-223 targeting metastatic bone lesions. **Materials and methods:** The current ICRP systemic biokinetic model structure and transfer parameters of thorium were taken as the prior model and parameters for pharmacokinetic modelling. Because the immediate decay product Ra-223 is another high LET alpha-emitter which can potentially be toxic to healthy tissues, the biokinetic model of radium was coupled to that for Th-227. By doing so, the bio-distributions of Th-227 and Ra-223 in human body can be simultaneously monitored. Furthermore, other decay products were as well taken into account and connected to Ra-223 as independent biokinetic models. **Results:** Model predictions show that 67% of Th-227 leaves blood with a clearance half-life of 6 h and deposits on the bone surface, 6% of Th-227 deposits in the liver and 4.5% of Th-227 deposits in the kidneys. The progeny Ra-223 deposits a similar activity in the alimentary tract and in the liver as the parent Th-227. The retentions of Ra-223 as progeny in kidneys and testes are about 8% of that of parent Th-227. **Conclusion:** The modelled pharmacokinetic bio-distributions of Th-227 and its decay products can be used as start distributions for local kinetic analysis, such as bone surface, volume, marrow and blood. The bio-distributions of decay products can be further used for patient dosimetry assessments.

1007 **Monday, October 15, 2018, 16:30 - 18:00, Hall 1**

Teaching Session 4 - Interactive Clinical Cases: Lung TNM 8 and Function of the Lung MDM

OP-387a

TNM of Lung Cancer 8th Edition

A. Eccles; Guy's and St. Thomas' Hospitals NHS Foundation Trust, London, UNITED KINGDOM.

OP-387b

TNM of Lung Cancer 8th Edition

T. Lynch; Belfast, UNITED KINGDOM.

OP-388

What do the Respiratory Physicians want from your Report?

N. Magee; Belfast City Hospital, Consultant Respiratory Physician, Belfast, UNITED KINGDOM.

OP-389

What do the Surgeons want from your Report?

K. McManus; Belfast Health and Social Care Trust, General Thoracic Surgeon, Belfast, UNITED KINGDOM.

OP-390a

Nodal Stations - Which Stations can be Reached and What Methods are Available

N. Magee; Belfast City Hospital, Consultant Respiratory Physician, Belfast, UNITED KINGDOM.

OP-390b

Nodal Stations - Which Stations can be Reached and What Methods are Available

K. McManus; Belfast Health and Social Care Trust, General Thoracic Surgeon, Belfast, UNITED KINGDOM.

1008 **Monday, October 15, 2018, 16:30 - 18:00, Hall 4**

Clinical Oncology: PSMA Ligand Therapy of Prostate Cancer

OP-391

Radioligand Therapy with 7.4 GBq 177-Lu-PSMA-617 in patients with mCRPC in a 6 weekly interval

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Background: Radioligand Therapy (RLT) using ^{177}Lu-PSMA-617 is generally well tolerated and shows respectable PSA response rates and seems to prolong survival. Initially an injected dose of 6 GBq ^{177}Lu-PSMA-617 at an 8 weekly interval was recommended. The aim of this study was to evaluate response and safety of a shortened cycle interval combined with slightly elevated therapeutic activity. **Methods:** A total number of 30 patients with mCRPC were treated with approx. 7.4 GBq ^{177}Lu-PSMA-617 every 6 weeks (range 6.0 - 7.7 GBq). All patients had exhausted conventional therapeutic options (median age, 67.6 years; range, 50.9 - 82.1). Data were analyzed with respect to response and safety according PCWG3 and common toxicity criteria. **Results:** In median 7.2 GBq of ^{177}Lu-PSMA-617 was injected every 6 weeks. In 23 cases at least 3 cycles of RLT were performed. In 7 patients no 3rd cycle was performed due to progression or death. A PSA decline of 50% or more occurred

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