absence in some cases. The [^{161}Tb]Tb-PSMA-617 group is ongoing, therefore comparative efficacy in tumor size and survival will be presented.
Conclusion: PSMA-targeted radioisotope therapy and combined TAT could improve disease management by delaying progression, emphasizing the need for further studies to optimize administration schemes according to patient status and lesion type.
Funding Acknowledgements: Centro Uruguayo de Imagenología Molecular

Keywords: Actinium-225, Terbium-161, Lutetium-177

Area/Category: Beta Therapy - Pre-clinical studies

P-25 (313)

Galectin-3 as a Candidate Nephroprotective Adjunct in 177Lu-DOTATATE Therapy: Acute and Chronic Findings in Mice

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Introduction: Neuroendocrine tumors (NETs) are most common in the gastrointestinal tract and respiratory system and mostly exhibit high expression of somatostatin receptors, allowing the therapeutic use of the radiopharmaceutical 177Lu-DOTATATE. However, nephrotoxicity is a significant adverse effect of this therapy, partially reduced by the co-administration of amino acids, which cause side effects and do not offer complete protection. Galectin-3 (Gal-3), a lectin of approximately 27 kDa encoded by the LGALS3 gene, has been studied for its roles in inflammation, immunoregulation, and apoptosis, and may act as a nephroprotective agent.
Objectives: The renal protective potential of Gal-3 and its variants (R186S and K176L) against nephrotoxicity induced by 177Lu-DOTATATE was evaluated, in addition to pharmacokinetic characterization radiolabeled with ^{99}mTc.
Materials and Methods: Male BALB/c mice were divided into seven groups: control, Gal-3, Gal-3 + amino acids, Gal-3-R186S, Gal-3-K176L, amino acids, and 177Lu-DOTATATE. All, except the control, received 177Lu-DOTATATE at a therapeutic dose (75 MBq). Kidney damage was assessed in the acute (2 weeks) and chronic (3 months) phases. The kidneys were histologically analyzed by H&E and Masson's trichrome staining to identify lesions and fibrosis. Blood samples were used to measure urea and creatinine levels. Biodistribution and μSPECT/CT imaging with ^{99}mTc-labeled galectins were performed 1 hour after injection. Pharmacokinetic profiles were determined by analyzing blood samples collected at different time intervals up to 24 hours. Stability tests were performed in mouse serum and saline for up to 24 hours.
Results: Radiolabeled galectins showed radiochemical purity >95% and stability up to 24 h; elimination was predominantly renal, with R186S exhibiting higher renal uptake and wild–type Gal–3 slower clearance. Acute phase (2 weeks): Gal–3 alone demonstrated better preservation of renal morphology than 177Lu-DOTATATE alone and performed comparably to amino acids, with stable urea/creatinine levels. Chronic phase (3 months): Groups treated with Gal–3, particularly Gal–3 combined with amino acids, showed preserved morphology and absence of fibrosis; other groups displayed discrete lesions with minimal fibrotic foci. Urea and creatinine remained stable in most groups, with elevations noted in the amino–acids–only group.
Conclusion: Galectin–3 mitigated 177Lu-DOTATATE–induced renal injury in mice. In the acute phase (2 weeks), Gal–3 alone performed as well as amino–acid infusion and better than none. By 3 months, the Gal–3 + amino–acid group showed clear structural preservation, while other groups had mild residual lesions; these preclinical data support Gal–3 as a candidate adjunct, warranting dose–finding and mechanistic studies before clinical use.
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Keywords: 177Lu-DOTATATE, Gal-3, nephrotoxicity

Area/Category: Beta Therapy - Pre-clinical studies

P-26 (315)

2-[^{131}I]Iodomelatonin for Breast Cancer: Synthesis, Stability, Biodistribution, and Antitumor Activity in MCF-7 Xenografts

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Introduction: Breast cancer remains a leading cause of morbidity and mortality worldwide. Although therapies such as tamoxifen improve survival, resistance and side effects limit long-term efficacy. Melatonin receptors (MT1/MT2) are expressed in breast cancer cells, supporting the concept of receptor-mediated targeting. These observations motivate the exploration of radioiodinated melatonin as a therapy strategy. In this context, iodine-131–labeled melatonin (2-[^{131}I]iodomelatonin) represents a potential purpose agent for breast cancer therapy.
Objectives: To synthesize and evaluate the novel MT1-selective radioligand 2-[^{131}I]iodomelatonin for its physicochemical stability, biodistribution, and antitumor efficacy in an MCF-7 xenograft model.
Materials and Methods: General procedures. All reagents were analytical grade (Sigma-Aldrich, Brazil/Canada). Na-^{131}I was obtained from IPEN (São Paulo). Analytical HPLC was performed on an Agilent 1200 system with a Zorbax Eclipse Plus C18 column (5 μm, 4.6 × 250 mm) and UV detection at 254/280 nm.
Radiochemistry. Melatonin (400 μg; $\sim 1.7\times10^{-6}$ mol) in ethanol (20 μL) was reacted with Na-^{131}I (37 MBq, 20 μL) in NaH_2PO_4 buffer (0.05 M, 400 μL) and peracetic acid (2:1 v/v, 150 μL). After 40 min at room temperature, the reaction was quenched with sodium metabisulfite, evaporated under nitrogen, and reconstituted in saline. Identity and purity were confirmed by HPLC using co-elution with authentic melatonin.
In vitro stability. Aliquots (0.37 MBq) were incubated at 37°C in saline or mouse serum and analyzed by iTLC at 5 and 30 min, 1–6 h, 24–72 h, and 7 days.
Animal studies. Female BALB/c nude mice (4–8 weeks) were inoculated s.c. with 5×10^6 MCF-7 cells. For biodistribution, mice (n=5/time) received 1.85 MBq 2-[^{131}I]iodomelatonin (100 μL, i.v.) and were euthanized at 15, 30, and 60 min; organ uptake was expressed as %ID/g. For therapy, mice (n=5/group) received weekly injections for three weeks of: A) 7.4 MBq 2-[^{131}I]iodomelatonin, B) 7.4 MBq Na-^{131}I, or C) saline. Tumor volumes were measured every 3 days with blinded calipers until endpoint.
Results: 2-[^{131}I]iodomelatonin was synthesized with >95% radiochemical purity, a 78.6% radiochemical yield, and molar activity of 2.1 MBq/nmol. The compound was highly stable, retaining >95% integrity in saline for 7 days and in serum up to 3 h, with 84% remaining at day 7. Tumor uptake was rapid and transient, peaking at 1.72 ± 0.56 %ID/g at 15 min, then declining to 0.90 ± 0.49 %ID/g (30 min) and 0.39 ± 0.23 %ID/g (60 min). Liver and intestinal accumulation suggested hepatobiliary clearance, and stomach activity was consistent with iodinated tracers. Therapeutically, 2-[^{131}I]iodomelatonin markedly reduced MCF-7 tumor growth; by day 24, mean tumor volume decreased by ~73.6% vs saline and ~69.9% vs Na-^{131}I. No overt toxicity or weight loss was observed.
Conclusion: 2-[^{131}I]iodomelatonin can be synthesized efficiently with high yield and purity, demonstrates excellent stability, exhibits rapid but specific tumor uptake, and significantly inhibits MCF-7 tumor growth compared with

both saline and Na-^{131}I controls. These results support further preclinical optimization and dosimetric studies toward its development as a therapy agent for breast cancer.

Funding Acknowledgements: Instituto de Pesquisas Energéticas e Nucleares

Keywords: cancer, melatonin, therapy

Area/Category: Case Report - Beta Therapy - Clinical applications

P-27 (252)

Radioiodine Therapy in a Patient with Plummer's Disease and Liver Cirrhosis on the Transplant List: Case Report

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Case Description: A 50-year-old male patient presented to the hepatology outpatient clinic reporting a thyroid nodule for one year, along with choking, hoarseness, and weight loss. He denied prior medication use, transfusion, or jaundice. Imaging studies described chronic liver disease and a thyroid nodule (Tirads 4) seen on ultrasound and CT scan. Laboratory tests showed negative serology for hepatitis, suppressed TSH (0.01), elevated free T4 (1.93), and elevated ferritin (1747), with negative C282Y and H63D genetic mutations (homozygous wild-type). Thyroid scintigraphy with iodine-131 confirmed a toxic nodule, with all other exams normal. The patient was diagnosed with liver cirrhosis and Plummer's disease. Liver transplantation was contraindicated due to the high surgical risk, as well as the use of methimazole due to the high risk of drug-induced hepatitis. Radioiodine therapy (30 mCi) was performed in September 2025. The patient is awaiting remission of hyperthyroidism for transplantation

Discussion: Nuclear medicine played an important role in this case, as it allowed both the diagnosis of the toxic nodule through scintigraphy and the therapy, being the only viable option through radioiodine therapy

Conclusion: This report highlights the evolution of a patient with Plummer's disease and advanced liver cirrhosis, for whom the use of antithyroid medication or liver transplantation was contraindicated. Radioiodine therapy was the adopted alternative, enabling the reduction of thyroid function and making liver transplantation possible.

Ethical Criteria: The case report was conducted in accordance with the ethical principles of the Declaration of Helsinki. The patient signed the Informed Consent Form, authorizing the publication of the data in an anonymous and confidential manner.

International Guidelines: The study followed the ethical principles established by the Declaration of Helsinki and complied with the recommendations of the International Committee of Medical Journal Editors (ICMJE) regarding the publication of clinical case reports.

Keywords: Thyroid Nodule, Liver Cirrhosis, Plummer-Vinson Syndrome

Area/Category: Case Report - Beta Therapy - Clinical applications

P-28 (281)

FDG PET/CT detection of neurolymphomatosis in relapsed Burkitt lymphoma with excellent early response to intrathecal and systemic therapy

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Case Description: Introduction: Burkitt lymphoma (BL) is an aggressive B-cell lymphoma with frequent extranodal spread and risk of central nervous system (CNS) involvement. FDG PET/CT is central for staging and response assessment using the Deauville 5-point scale (D5PS) (1,2). Neurolymphomatosis (NL) infiltration of peripheral nerves/roots by lymphoma—is uncommon and may be occult on MRI; FDG PET/CT can reveal FDG-avid nerve roots and plexuses (3,4).

Objectives: To report FDG PET/CT identification of FDG-avid cervical (C8) and lumbar (L4) nerve roots in relapsed BL with leptomeningeal disease, and to correlate imaging with CSF flow cytometry and early therapeutic response.

Materials and Methods: Male, 48 years, BL (stage IV at baseline), previously treated, achieved interim D5PS 3. In Feb/2021, presented with headache; CSF flow cytometry confirmed leptomeningeal relapse. Brain MRI was normal. Whole-body FDG PET/CT (60 min post-injection; hybrid scanner, BLINDING) showed two focal FDG-avid nerve roots (C8 right, SUVmax 15.7; L4 right, SUVmax 10.9) with mediastinal/liver SUVs 3.0/4.6.

Discussion: Findings were consistent with NL and CNS relapse (D5PS 5). Patient received intensified intrathecal chemotherapy (multiple administrations) plus ICE systemic salvage. Serial CSF analyses converted to negative on two consecutive assessments, with symptom resolution and hematologic recovery, indicating excellent early response. No other new FDG-avid lesions were detected outside the nerve roots at that time.

Conclusion: This case underscores three practice points: (i) FDG PET/CT can detect NL in BL even when MRI is non-diagnostic, highlighting FDG-avid nerve roots/plexuses (3,4); (ii) Deauville-based interpretation remains standard in FDG-avid lymphomas, supporting imaging-guided therapeutic decisions (1,2); (iii) In BL, where CNS relapse is a known adverse prognostic factor, recent data show that achieving early complete response (CR) translates into markedly better event-free and overall survival (EFS/OS) (5). Thus, in cases of radiculopathy or new neurologic symptoms in aggressive B-cell lymphoma, especially BL, prompt PET/CT evaluation followed by rapid intrathecal/systemic therapy may alter the historically poor prognosis of neurolymphomatosis and leptomeningeal involvement (6). Early achievement of metabolic remission in PET strongly correlates with favorable outcome and should be integrated into multidisciplinary management.

Ethical Criteria: Conducted per Helsinki Declaration; retrospective, anonymized data, no additional patient risk.

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Keywords: Burkitt Lymphoma, Positron Emission Tomography, Neurolymphomatosis

Area/Category: Case Report - Beta Therapy - Clinical applications

P-29 (283)

FDG PET/CT findings in a giant cell tumor of the distal femur mimicking high-grade sarcoma: diagnostic and metabolic implications

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