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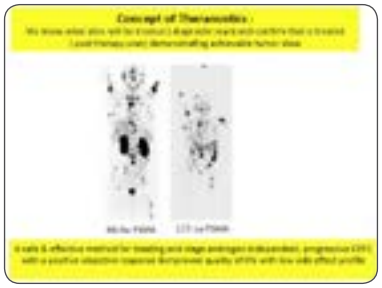
Precision management in castration resistant prostate cancer (CRPC): A theranostic approach

The term theranostics is the combination of a diagnostic tool that helps to define the right therapeutic tool for specific disease. It signifies the "we treat what we see and see what we treat" concept. A diagnostic radionuclide is labelled with the target and once expression is documented, the same target is labelled with a therapeutic radionuclide and treatment is executed. In Nuclear Medicine theranostics is easy to apply because of an easy switch from diagnosis to therapy with the same vector. This concept is utilized in few malignancies and prostate cancer is one of them. PSMA (prostrate specific membrane antigen) expression in normal and other tumor is less than prostate cancer cell. Its expression increases with higher grade and hormone resistance. We have reported excellent sensitivity and detection capability of PSMA for sub centimeter sized lymph nodes at staging. Besides evaluation of recurrence, 68Ga-PSMA PET can be utilized in advanced prostate cancer for detection of metastasis. 68Ga-PSMA also serves the basis of treatment of CRPC with 177Lu PSMA. Progression to androgen independence is the main cause of morbidity & death in these patients. Based on the theranostic concept the aims of treatment with 177Lu PSMA are to improve outcome by early interventions in suboptimal responders, sparing low risk patients from over treatment, reduce treatment related side effects, ensure effective palliation & improve quality of life. Tumor targeting with 177Lu PSMA saves normal tissue & delivers high dose to tumor. Easy radiopharmaceutical labelling & high expression in all cancer cells makes it an optimal target for radionuclide therapy. It is safe with a low toxicity profile. In our experience at RGCI & RC (our institute) we have seen objective regression in lesions and symptomatic relief & found it to be a safe & effective method for treating end stage androgen independent, progressive CRPC. We believe that treatment of recurrent prostate cancer is feasible with 177Lu PSMA with a positive objective response & a low side effect profile where achievable tumor dose is demonstrated by Ga-68 PSMA scan before therapy.



Recent Publications

1. Gupta M et al. (2017) Risk stratification & staging in prostate cancer with prostate specific membrane antigen PET CT : A one-stop-shop. Hell. J. Nucl. Med. 20 Suppl:156.
2. Gupta M et al. (2017) Comparative study of 68Gallium-prostate specific membrane antigen positron emission tomography-computed tomography and magnetic resonance imaging for lymph node staging in high risk prostate cancer patients: An initial experience. World J. Nucl. Med. 16(3):186-191.
3. Gupta M et al. (2018) incremental value of 68gallium-position specific membrane antigen positron emission tomography/computed tomography in patients with abnormal PSA and benign transrectal ultrasound biopsy. Urology Annals. 10(2):150-153.

4. Choudhury P S and Gupta M (2017) Personalized & precision medicine in cancer: A theranostic approach. Curr. Radiopharm. 10(3):166-170.

Biography

Partha S Choudhury is an internationally acclaimed leading Nuclear Medicine Physician of India with special interest in radionuclide therapy of various types of cancers. He has more than 25 years of experience in Nuclear Oncology. He currently heads the Department of Nuclear Medicine at Rajiv Gandhi Cancer Institute & Research Centre, New Delhi, India since 1998 and has been instrumental in its sustained growth over the last 20 years. He has introduced and standardized new procedures in the department both in terms of disease specific diagnostic and molecular imaging & molecular therapy. He is an Invited Speaker at several conferences and symposiums across many countries, the main ones being United Kingdom, Austria, South Africa and South America. He is an avid Clinical Researcher with publications in peer reviewed journals. He is a technical Co-Operation Consultant and participant of coordinated research projects of International Atomic Energy Agency (IAEA) Vienna, Austria.

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