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Stem Cells

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Abstract

Objective: The objective of this presentation is to create awareness of stem cell applications in the ISORBE community and to foster a strategy of how the ISORBE community can disseminate information and promote the use of radiolabeled stem cells in biomedical applications.

Methods: The continued excitement in Stem Cells, in many branches of basic and applied biomedical science, stems from the remarkable ability of stem cells to divide and develop into different types of cells in the body. Often called as Magic Seeds, stem cells are produced in bone marrow and circulate in blood, albeit at a relatively low concentration. These virtues together with the ability of stem cells to grow in tissue culture have paved the way for their applications to generate new and healthy tissues and to replace diseased or injured human organs. Although possibilities of stem cell applications are many, much remains yet to be understood of these remarkable magic seeds.

Conclusion: This presentation shall briefly cover the origin of stem cells, the pros and cons of their growth and division, their potential application, and shall outline some examples of the contributions of radiolabeled stem cells, in this rapidly growing branch of biomedical science.

Key words: Radiolabeled stem cells, stem cell kinetics, biomedical applications, magic seeds

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False-Positive Results of 68ga-Dotatate and 11c-Choline Pet/CT in Patients with Hormone-Resistant Prostate Cancer at Biochemical Recurrence are Related to Inflamed Lesions

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Abstract

Objective: For an oncological tracer is relevant to know the uptake in inflamed/infected lesions. Thus, in the framework of a prospective trial aiming to compare the clinical value of 68Ga-DOTATATE and 11C-Choline PET/CT in patients with hormone-resistant prostate cancer at biochemical recurrence, we evaluated the false-positive findings of both techniques.

Methods: The study group comprised 64 prostate cancer patients with PSA relapse under androgen deprivation therapy, with a median trigger PSA level of 4.25 ng/mL (range: 0.22-291 ng/mL). Within 1-2 weeks, a PET/CT study was performed with 68Ga-DOTATATE and 11C-Choline with an approximately dose of 100 MBq and 400 MBq, respectively, using a 64-slice PET/CT with time-of-flight correction. Correlative imaging, histopathology and/or clinical follow-up were considered as reference standard.

Results: Both techniques showed positive local, regional and distant findings in 31 patients. Results were concordant in 57 cases (89%), with discordant findings observed in patients with bone (n=2) and regional lymph nodes lesions (n=5). On a per patient basis, sensitivity, specificity, positive and negative predictive values with their 95% confidence intervals were the same for both techniques: 0.82 (0.65-0.93), 0.90 (0.73-0.98), 0.90 (0.73-0.98) and 0.81 (0.65-0.93), respectively. False-positive lesions (n=5) were found, for both tracers, in 3 patients and were located in the prostate bed (n=1) and regional lymph nodes (n=4, being 3 discordant). In all cases, pathology revealed non-specific inflammatory lesions.

Conclusion: This study demonstrates avid 68Ga-DOTATATE and 11C-Choline accumulation in inflammatory tissue, which may limit the specificity of these techniques for the detection of occult metastatic disease.

Key words: Prostate cancer, biochemical recurrence, 68Ga-DOTATATE, 11C-Choline

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