Clinical Practice of Molecular Radiotherapy

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This is the first supplement published by *The Journal of Nuclear Medicine* that is dedicated to the interesting topic of the clinical practice of molecular radiotherapy. This supplement is timely, because updated monographic reviews of this expanding and growing field are not readily available.

For me, it was a pleasure to read this supplement because it was written by pioneers and world-class experts in the field of molecular radiotherapy. Although the title of this supplement suggests that the content is dedicated to current therapeutic nuclear medicine, it is also true that iodine ^{131}I, one of the first forms of targeted therapy in cancer medicine, has been used by nuclear medicine specialists to treat benign and malignant thyroid conditions for more than 5 decades. During this time, especially over the past 20 years, the accelerated growth in this field has been due, in part, to a better understanding of pharmacokinetics, biodistribution, dosimetry, and the toxicity profiles of the various compounds used in targeted radionuclide therapy. Furthermore, the fairly recent Food and Drug Administration approval of 2 radiolabeled monoclonal antibodies, ^{90}Y-ibritumomab tiuxetan (Zevalin; Biogen Idec) and ^{131}I-tositumomab (Bexxar; GlaxoSmithKline), for the treatment of relapsed or refractory non-Hodgkin's lymphoma has created additional interest in the field.

This monographic supplement to *The Journal of Nuclear Medicine* is a collection of reviews and articles written by authors from the United States and Europe. It contains 26 articles, beginning with one entitled "A Pragmatic Perspective on Molecular Targeted Radionuclide Therapy," written by the 2 editors of the supplement. In this initial article, the authors explain that the supplement is "a pragmatic perspective intended to offer relevant advice to nuclear medicine practitioners and other professionals who may be actively involved in radionuclide therapy to provide them with a summary of suggested patterns of practice for common radionuclide therapies now available." These objectives are met perfectly as the various forms of radionuclide therapy, commercially available or in different stages of research, are systematically reviewed.

The initial articles discuss the principles of radionuclide therapy and are followed by an explanation of the dosimetry of internal emitters. Other articles are dedicated to more traditional forms of radionuclide therapy, including ^{131}I, bone-seeking radionuclides for therapy, and radiosynovectomy. I most enjoyed reading the article that focused on the use of ^{131}I in thyroid cancer, not only because the topic is relevant to my daily clinical practice, but also because the article is an up-to-date, insightful, practical, and well-structured review of this subject. The relevance of the topic is reflected by the fact that the incidence of thyroid cancer is one of the most rapidly growing in the United States, having been expected to increase 17% in 2005 over 2004, with about 30,180 new cases having been expected in 2006.

Other articles are dedicated to the review of ^{131}I-metaiodobenzylguanidine, as well as of somatostatin receptor analogues and peptides for targeted radionuclide therapy in adults and in children. The most extensively reviewed subject is peptide receptor radiotherapy, mainly with ^{177}Lu- and ^{90}Y-somatostatin analogues. A total of 8 articles provide an in-depth review of the indications, dosimetry, patient preparation, imaging, toxicities, complications, results of prior trials, future therapy protocols, and possible future applications of this novel form of targeted radionuclide therapy. Another article focuses on the use of this type of therapy in differentiated thyroid cancer. Also of great interest is an article presenting a practical overview of patient treatment in the form of 3 patient cases, with insightful commentaries in the discussion section.

Another subject to which 5 articles are dedicated is radiolabeled monoclonal antibodies, currently generating extensive interest in clinical practice and medical research. These articles review the applications of radioimmunotherapy in hematologic malignancies, solid tumors, pediatric malignancies, ^{131}I-tositumomab in non-Hodgkin's lymphoma, and even immuno-PET.

This monographic supplement finishes with a collection of articles describing ^{68}Ga-labeled peptides, radiotargeted gene therapy, radiation sensitizers, the induction of apoptosis with hybrids of Arg-Gly-Asp molecules, and the antimitotic effects of hybrids of cytostatic drugs and peptides; the final article reviews the potential of α-particle therapy.

The review articles are well structured, user friendly, and straightforward. Despite the many authors contributing to this supplement, the result is consistent and fairly homogeneous.

I encountered one shortcoming in this supplement. Some topics in targeted radionuclide therapy were not covered, such as the use of radiolabeled microspheres for the treatment of hepatocarcinoma and liver metastasis from colorectal cancer, the application of radionuclides for selective therapy in coronary artery disease, and the treatment of hyperthyroidism with ^{131}I.

In conclusion, this supplement of *The Journal of Nuclear Medicine* is easy to read, has excellent-quality images and relevant tables, and provides a practical overview of the current uses and possible future applications of this increasingly important medical therapy. Considering that our knowledge of cellular and molecular biology is accelerating rapidly, that new targets for targeted therapy are continually being discovered, and that radiopharmaceutical formulations are reaching an ever-increasing level of sophistication, this monographic review of molecular targeted radionuclide therapy provides a timely, extensive, expert, and invaluable review.

Therefore, I recommend this supplement as an indispensable resource for nuclear medicine physicians, radiologists, and their residents, as well as for oncologists or any other health care professional interested in the subject. Monographic reviews such as this will help increase knowledge of, and interest in, this modern form of medical therapy for the benefit of the patient.

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