Non-Hodgkin’s lymphoma (NHL) is a clinically and molecularly heterogeneous group of malignant lymphoproliferative diseases. Diffuse large B cell NHL (DLBCL) is the most common subtype followed by indolent or low-grade lymphomas [follicular lymphoma (FL), being the most common subtype among indolent-type lymphoma]. Addition of anti-CD20 therapy (immunotherapy, rituximab) to cyclophosphamide, doxorubicin, vincristine and prednisone results in cure in over half of the patients and is currently the standard of care. For asymptomatic, low-tumour burden FL, a ‘wait-and-watch’ policy is generally followed. Early-stage FL is treated with local radiation. For symptomatic FL the first-line treatment is chemo-immunotherapy followed by two-year maintenance therapy with anti-CD20 monoclonal antibodies. The CD20 antigen is a transmembrane protein that acts as a calcium channel and plays a key role in cell cycle progression and differentiation of B cells. CD20 antigen is present in approximately 9 per cent of peripheral blood mononuclear fraction and >90 per cent of B cells from blood and lymphoid organs. Lymphoma cells from >90 per cent of patients with B cell NHL express this antigen. Therefore, CD20 is an attractive target molecule in the treatment of B cell NHL.

A number of radionuclides are being used in medicine either for diagnosis or therapy. Monoclonal antibodies are considered efficient carriers for radionuclides to be delivered to the target (also called radio-immunotherapy, RIT). Radiolabelled compounds (therapeutic radiopharmaceuticals) once administered reach to the target molecule present on the surface of tumour cells and directly interact with these cells. The $^{90}$yttrium ($^{90}$Y)-labelled ibritumomab tiuxetan is one such therapeutic radiopharmaceutical that conjugates an anti-CD20 monoclonal antibody with the beta-emitting radionuclide $^{90}$Y using the chelating agent tiuxetan; $^{90}$Y is a pure beta emitter with a half-life of 64 h (2.7 days) that decays to $^{90}$Zr. It has an effective path length of 5.3 mm, meaning that 90 per cent of its energy is absorbed within a sphere with 5.3 mm radius.

Ibritumomab tiuxetan, the $^{90}$Y immunotherapy ($^{90}$Y-IT), was approved for the treatment of relapsed indolent or low-grade FLs or transformed B cell NHL and for patients with rituximab-refractory follicular NHL. This therapy should be considered for patients with indolent lymphoma in the first relapse, who have tumour long-axis diameter $\leq$2.5 cm and SUV$_{\text{max}}$ $\leq$6.5. $^{90}$Y-IT improves the response rate and outcomes of relapsed/refractory DLBCL patients and in mantle cell lymphoma (MCL) where it has been used to treat minimal residual disease (as consolidation) after first-line chemotherapy. In addition to RIT, recently, there has been development of new classes of highly effective immunotherapeutic approaches including chimeric antigen receptor T cell therapy that are designed to bypass cancer immune evasion.

This book is arranged in 10 chapters: the first chapter gives a comprehensive overview of the clinical use, efficacy, toxicity and safety profile of ibritumomab. $^{90}$Y-IT uses an antibody to mediate complement-mediated cytotoxicity, along with the delivery of high-energy, short path length (5 mm) beta irradiation from $^{90}$Y to both CD20-lymphoma cells and neighbouring tumour cells that are inaccessible to the antibody or have insufficient antigen expression as a result of a cross-fire effect, with little effect on other solid organs. The expected short-term toxicity associated with $^{90}$Y-IT is mainly reversible myelosuppression followed by the
potential development of myelodysplastic syndrome and secondary leukaemia in long term. The second chapter deals with the biology and pathology of B cell lymphomas. The heterogeneity of B cell NHL is nicely captured through WHO classification and the cellular origin of B of mature B cell neoplasms. Better understanding of the microenvironmental interactions in B cell lymphomas has led to the identification of targets and development of newer targeted therapies. The third chapter deals with the issue of resistance to $^{90}$Y ibritumomab tiuxetan therapy. It has been suggested that bulky disease, downregulation of CD20 or activation of NF-kB or a combination of these factors is the potential cause of resistance to $^{90}$Y-IT.

The next three chapters deal with the characteristics of ibritumomab, radiation dosimetry and response evaluation. $^{18}$F-fluorodeoxyglucose positron emission tomography ($^{18}$F-FDG PET)/computed tomography scan is currently the standard investigation for the evaluation of response for lymphoma. Negative PET finding at three months after $^{90}$Y-IT is highly predictive of complete response. However, metabolic response to $^{90}$Y-IT could be gradual with continued declines of FDG uptake occurring between 7 and 9 months after therapy; therefore, PET-positive result after three months does not warrant immediate additional therapy.

The subsequent chapter deals with the preparation and schedule of $^{90}$Y-IT administration, resistance and heterogeneity of intratumoral antibody distribution and data on radiation dosimetry for patients receiving ibritumomab therapy. The authors described combining radionuclide therapy and other immune-based therapies to overcome resistance in cancer. In the concluding chapter the authors describe prospects for enhancing the efficacy of RIT which has been little utilized because of a variety of medical, financial and logistic obstacles. Newer technologies employing multistep ‘pre-targeting’ methods, particularly those utilizing bi-specific antibodies, have greatly enhanced the therapeutic efficacy of RIT and diminished its toxicities.

This multi-authored book serves as a reference book on the use of RIT in the treatment of B cell indolent-type lymphoma with good summary of data, potential mechanisms of resistance and possible options for minimizing resistance and improving results. A few details are missing, especially data on DLBCL, MCL, high-dose chemotherapy and stem cell transplant would have been of interest.

Overall, the book will be a useful companion for oncologists, lymphoma pathologists, nuclear medicine specialists, researchers and physicians involved in the management of lymphomas with radionuclide therapy. This would be a good reference book in the medical libraries.

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Quick Response Code: Therapeutic application of nitric oxide in cancer & inflammatory disorders, 1st edition, L. Morbidelli, B. Bonavida, editors (Academic Press, Elsevier, UK) 2019. 372 pages. Price: Not mentioned.
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The present book discusses the therapeutic applications of nitric oxide (NO) in three parts; the first in cancers, the second in inflammatory diseases and the third part involves the collection of abstracts from the conference held in Siena, Italy, on October 4-5, 2018. This book is designed to share knowledge from the highly reputed eminent researchers and clinicians in the field of NO and related bioactive nitrogen oxides, as signalling molecules in physiological and pathophysiological states.

In the first chapter, the role of NO donor nanoparticles to be used for cancer chemotherapy is discussed as it would release NO at target site, contributing to the reversal of multidrug resistance (MDR) in cancer cells, in comparison with lower doses, which given independently does not have the potential to trigger apoptosis. This nanoparticle which has the ability to induce leakiness in the blood vessels, when combined with traditional cancer chemotherapeutic