

Radiolabelled antibody therapy for Lymphoma

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Lymphomas arise in lymph-nodes or lymphatic tissue of parenchymatous organs. In Hodgkin's Disease about 90% of patients manifest disease initially in the lymph-nodes while in Non-Hodgkin's Lymphoma (NHL) only 60% have disease originating in lymph-nodes. Two-thirds of NHL are B-cell lymphomas and one-third T-cell. Overall B-cell lymphomas account for 95% of lymphomas. Lymphomas can be classified diffuse or follicular and are characterised as indolent, intermediate or aggressive (REAL classification).

Monoclonal antibodies (MoAb) against antigens expressed on the surface of B-cells eg HLA-DR, CD19, CD20, CD21, CD22, CD37 and CD52 kill lymphoma cells by ADCC (antibody dependent cellular cytotoxicity) or by CDC (complement dependent toxicity), or may induce apoptosis. To increase the efficacy of cell-kill by 'cross-fire' radiation and reduce relapse-rates, the MoAb can be labelled with a radionuclide such as Iodine-131 or Yttrium-90. Commonly used anti-CD20 radiolabelled antibodies are Iodine-131 tositumomab (Bexxar) and Yttrium-90 ibritumomab tiuxetan (Zevalin), both FDA approved for patients with relapsed or refractory low-grade, follicular or transformed B-cell NHL. Survival rates seem to have improved, with radiolabelled anti-body as compared to the 'cold' antibody alone.

Adverse events include asthenia, nausea, fever/chill headache, vomiting and rash. Subacute haematologic toxicities such as neutropenia and thrombocytopenia usually develop after five to seven weeks. HAMA's (human anti-mouse antibodies) formation is a problem to overcome when using murine MoAb.

In the future it is possible that other antibodies and other radiolabels may be used, and combination treatment with chemotherapy and radiotherapy may also be more frequent. Our experience in Singapore is with Iodine-131 rituximab a mouse-chimeric antibody, some cases are presented.

Reference:

Radiolabeled Anti-CD20 Monoclonal Antibodies for the Treatment of B-cell Lymphoma. Robert Dillman. Journal of Clinical Oncology 20;16:3545-3557.