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CD20-directed serotherapy in patients with multiple myeloma: biologic considerations and therapeutic applications.

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Clonotypic B cells circulating in patients with multiple myeloma (MM) express CD20, and it has been suggested that these cells may be clonogenic. Furthermore, 20% of patients with MM express CD20 on their bone marrow plasma cells (BMPCs). Therefore, the authors began a phase II clinical study to determine the activity of the anti-CD20 monoclonal antibody rituximab in MM patients. Nineteen previously treated MM patients received 375 mg/m² rituximab per week for 4 weeks. Three months after initiation of treatment, patients were assessed for response and received a second course of therapy if their disease was stable (SD) or they achieved a partial response (PR). Six of 19 (32%) patients had either a PR (n = 1) or SD (n = 5), with a median time to treatment failure of 5.5 months (mean, 10.3 months; range, 3-27+ months). All six patients who had a PR or SD had CD20+ BMPC. Overall, rituximab therapy was well tolerated. Because most patients with MM poorly express CD20 on their BMPCs, the authors evaluated agents for their ability to induce CD20 expression and thereby facilitate rituximab binding on MM cells. These studies show that interferon-gamma (IFN- γ) induced CD20 expression on MM BMPCs, MM B cells, and healthy donor BMPCs. In contrast, CD20 expression on chronic lymphocytic leukemia, follicular non-Hodgkin's lymphoma, healthy donor B cells, and progenitor cells was unaffected by IFN- γ . Rituximab binding to the BMPCs of MM patients was also increased after culture with pharmacologically attainable levels of IFN-gamma (1-100 U/mL). In conclusion, these studies suggest that MM patients with CD20+ BMPCs may benefit from rituximab therapy. Furthermore, IFN-gamma induces CD20 expression on MM BMPCs and B cells and facilitates rituximab binding to MM BMPCs, providing the rationale for clinical trials to examine its use with CD20-directed serotherapies in MM.