Rituximab

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Rituximab is a monoclonal antibody used for treatment of cancer, rheumatoid arthritis, and Multiple sclerosis. It is a part of the IgG antibody class. Usage of monoclonal antibodies began to be explored in the 1900's and by 1980 there was research specifically in regard to using the antibodies to attack the CD20 protein attached to B cells. Research continued and Ronald Levy created rituximab as we know it today to target malignant B cells, and in 1997 it became FDA approved. (Pierpont, Limper, & Richards, 2018) Treatment for rheumatoid arthritis became FDA approved in 2006.

Rituximab is used for cancer treatment, specifically Non-Hodgkin Lymphoma. Non-Hodgkin Lymphoma (NHL) affects the lymphatic system, although not an autoimmune disease, autoimmune diseases can increase risks of developing NHL due to the connection to the immune system. Because the lymphatic system is distributed throughout the body, lymphomas can develop anywhere from the throat to bone marrow. Rituximab was the first therapeutic antibody approved for oncology patients and opened the door for treatment of other conditions. (Pierpont, Limper, & Richards, 2018) Rituximab or Rituxan, the brand name, is given to patients with NHL together with chemotherapy, on its own, or as part of pre- or post-chemotherapy treatment.

Another condition that benefits from treatment with rituximab is rheumatoid arthritis. rheumatoid arthritis is an autoimmune disease that effects the joints of the body and results in joint pain as well as decreased motor dexterity and mobility. Those with rheumatoid arthritis experience onset typically at smaller joints such as the fingers and then it proceeds to spread over time without treatment. Rheumatoid arthritis is believed to develop from environmental factors, cigarettes being one of the strongest environmental factors, and individual genetics.

Inflammation is also said to be triggered by pollutants affecting the lungs, gastrointestinal tract, and throat. (Chauhan, Jandu, Brent, & Al-Dhahir, 2023)

Rituximab binds to CD20, making the natural killer cells attack the targeted B cells. In NHL this reduces the number of cancerous cells by decreasing the total B cells. Because rheumatoid arthritis is an autoimmune disease, B cells produce autoantibodies, leading to inflammation. The attacking of the B cells decreases the quantity of cells and therefore overall inflammation. Typical dosage of Rituximab for Rheumatoid arthritis is 1000mg per intravenous infusion 2 weeks apart and 100mg of methylprednisolone is taken before the Rituximab to reduce reactions to the treatment. (Mok, 2013) For NHL, typical dosage is 375mg per square meter of the body surface area, also intravenously. Side effects of Rituximab include a weakened immune system and increased risk of infection, allergic reactions, bruising, and more. Side effects vary with individuals.

References

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