# Anti-CD20 monoclonal antibody (rituximab) in the treatment of pemphigus

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Since the 1960s, systemic corticosteroids with or without immunosuppressives have been the mainstay of therapy for the treatment of pemphigus. However, there are occasional refractory cases in which therapy with conventionally accepted modalities is either not efficacious or not possible on account of side effects.

Rituximab belongs to the class of biologicals and is a specific mouse and human chimeric monoclonal antibody. This IgG1 has a long half-life of 76 to 200 h and targets the CD20 antigen. The CD 20 antigen is present on pre-B, immature and mature B cells and is important for B-cell activation and proliferation. Binding of rituximab to CD 20 results in complement- and antibody-dependent cytotoxicity and subsequent apoptosis of cells exhibiting this antigen. CD20 is not expressed on stem cells and plasma cells and hence depletion of the B-cell subpopulation is transient and does not affect immunoglobulin synthesis. Normal levels of total serum IgG are maintained and antibody levels against HSV 1/2 and VZV are not significantly affected after rituximab treatment.

Rituximab is approved for use in the treatment of relapsing and refractory follicular lymphoma, where it has been shown to be highly efficacious. There are reports of its use in the treatment of autoimmune antibody mediated disorders such as rheumatoid arthritis, idiopathic thrombocytopenic purpura, autoimmune hemolytic anemia, myasthenia gravis and Wegener's granulomatosis. One of the main advantages of rituximab is low toxicity. Mild allergic reactions, such as fever and chills, sometimes occur during the first infusion but frequently do not recur with subsequent infusions.

Rituximab was first used in paraneoplastic pemphigus by Borradori *et al.* in 2001.[1] In this case, the drug was used for the concurrent follicular B-cell lymphoma; with four infusions over one month, the paraneoplastic pemphigus improved dramatically. Since then, over 20 reports of its use in pemphigus vulgaris and pemphigus foliaceus have appeared, eight in the past year alone.[1-4] All of these have been difficult-to-treat cases, many nonresponsive to conventional corticosteroids, pulse steroids, adjuvants (cyclophosphamide, azathioprine, mycophenolate mofetil, cyclosporine, etc.), plasmapheresis and intravenous immunoglobulin. Many of these patients were controllable only with high doses of steroids (over 60 mg/day prednisolone, often with adjuvants such as cyclosporine), but after the use of rituximab, the steroids could either be completely withdrawn or tapered to very low

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maintenance doses.

Rituximab is available in India as Mabthera® (Roche Products Ltd.) and is primarily used by oncologists. It is expensive and at this point of time, it is unlikely to replace the standard treatment in our country. However in patients nonresponsive to standard therapies, its use may be considered, especially in those who can afford the drug. It is given in a dose of 375 mg/$m^2$ as an intravenous infusion weekly for 4 weeks; in individual cases, further infusions may be necessary.

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