

Immunogenicity of N-Glycolylneuraminic Acid-Containing Carbohydrate Chains of Recombinant Human Erythropoietin Expressed in Chinese Hamster Ovary Cells

Abstract:

Recombinant human erythropoietin (EPO) produced by Chinese hamster ovary cells and distributed by two different pharmaceutical companies were confirmed to contain about 1% N-glycolylneuraminic acid (Neu5Gc) in total sialic acid content. Since chickens, like humans, do not synthesize Neu5Gc, they were used to determine the immunogenicity of Neu5Gc epitope in EPO. Chickens immunized with EPO did not produce significant titer of antibody that was specific to GM3(Neu5Gc) as compared to antibody titers produced in chickens immunized with fetuin containing 7% Neu5Gc or GM3(Neu5Gc) containing 100% Neu5Gc. Results obtained by an ELISA inhibition test showed that EPO, compared to GM3(Neu5Gc), reacted almost one thousand times less strongly with a human Hanganutziu-Deicher (HD) antibody. This study implies that an increase of Neu5Gc content in a molecule enhances its HD antigenicity. The response to Neu5Gc in patients receiving therapeutic injections of EPO is currently under investigation.