STUDIES OF COMPLEMENT FIXATION OF ANTIBODIES IN HUMAN BLOOD GROUP P SYSTEM

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The human blood group P system consists of three antigens, P_1, P and P^k and five phenotypes, P_1, P_2, p, P_1^k, and P_2^k, P_1, p and P^k antigens were recently identified as glycosphingolipids, Gal (α, 1–4) Gal (β, 1–4) GlcNAc (β, 1–3) Gal (β, 1–4) Glc-Ceramide, GalNAc (β, 1–3) Gal (α, 1–4) Gal (β, 1–4) Glc-Ceramide and Gal (α, 1–4) Gal (β, 1–4) Glc-Ceramide, respectively (NAIKI, M. & MARCUS, D. 1975).

The presence of antibodies in all three antigens in the sera from rare p donors, antibodies to P antigen in the serum from a rare p^k donor and antibodies to P_1 antigen in the serum from a P_2 donor were firstly demonstrated by a complement-fixation reaction with each antigen preparation contained in optimum, lecithin and cholesterol as auxiliarly lipids.

The anti-P_1 antibodies of P_2 serum were highly specific IgM, but such specific anti-P_1 antibodies were not detected in the p serum. All of the anti-p^k antibodies of p serum, consisting mainly of IgG, completely cross-reacted with P_1 antigen. The anti-p antibodies of p serum and P^k serum consisted mainly of IgM partially cross-reacted with Forssman glycolipid, GalNAc (α, 1–3) GalNAc (β, 1–3) Gal (α, 1–4) Gal (β, 1–4) Glc-Ceramide.

The anti-P^k antibodies of p serum separated from anti-p antibodies by absorption and continued reacting with the P_1 and P_2 erythrocytes. This observation indicated at first that the p^k antigen did appear on the surface of these cells.

Only parts of the anti-p^k antibodies, however, could be absorbed out with these cells, while all of them reacted with the P^k erythrocytes.

Rabbit anti-P_1 and anti-p sera and rat anti-p^k sera were first obtained by immunization of each glycosphingolipid antigen and methylated bovine serum albumin, and were compared in these specificities. The anti-P_1 antibodies were IgG with marked specificity, but the anti-P^k antibodies consisting of IgM cross-reacted with the P_1 antigen. The anti-P antibodies were composed of IgG and IgM. The IgM antibodies cross-reacted with Forssman glycolipid, but the IgG antibodies were highly specific.