28l-am03

Role of the C3a receptor antagonist SB290157 on anti-OVA polyclonal antibody-induced arthritis

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We investigated whether the C3a receptor antagonist (C3aRA), SB290157, was involved in suppression of anti-OVA pAb-induced arthritis because it is well known that anaphylatoxin C3a plays a crucial role in the development of an effective inflammatory response during complement activation. The anti-OVA pAb was developed from LEW/Sea rats immunized with chicken egg white. Anti-OVA pAb-induced arthritis was induced in DBA/1J mice by administration of anti-OVA pAb 0.5 h earlier than OVA (0 h). Two peaks of joint swelling were observed at 0.5 and 3 h. A role of C3a in arthritis was investigated by injection of SB290157 at the concentration of 10, 30, and 100 mg/kg at 0 and 2.5 h, 30 min before the first and second peaks. The antagonist was able to reduce joint swelling only at 3 h and about 50% inhibition of joint swelling was observed at the concentration of 30 and 100 mg/kg. Serum complement activity determined by C3 level was significantly decreased at 3 h compared to naïve mice. The results also revealed that the C3aRA was able to reduce the expression of IL-1beta in synovial tissue. Taken together, the results suggested that C3a was involved in induction of arthritis and C3aRA may be effective in the inhibition of arthritis mediated by C3a.