The time course of the carrageenan-induced oedema of the paw of the rat

The oedema of the rat paw induced by carrageenan injection develops slowly and reaches its peak in 4 h (Winter, Risley & Nuss, 1962). It is uninfluenced by pretreatment with antihistamine agents but is inhibited by salicylate congeners (Bonta, 1965). On the other hand, the paw oedema induced by dextran, yeast or egg albumin develops rapidly, reaching its maximum in ½ to 1 h and then slowly subsides (Winter & others, 1964). It is blocked by pretreatment with antihistamine and anti-5-hydroxytryptamine agents (Bonta, 1965). Thus oedema following carrageenan is attributable to capillary permeability from the release of kinins, while oedema from dextran, yeast or egg albumin mainly follows release of histamine and 5-hydroxytryptamine. We have now examined the time course of the oedema induced by carrageenan.

Adult albino rats, 80–100 g, were divided into groups of six. Carrageenan (0·05 ml of 1% suspension in normal saline) was injected subcutaneously into the hind paw. The volume of the paw was measured before and every ½ h after injection for 3 h by the micropipette method of Buttle, D'Arcy & others (1957). One group of rats served as control and one group each was treated with intraperitoneal injections of test drugs. Mepyramine (5 mg/kg, i.p.), 2-bromolysergic acid diethylamide (3·2 mg/kg, i.p.), acetylsalicylic acid (50 mg/kg, i.p.) and trasylol (20,000 units/kg, i.p.) were injected 1 h before the carrageenan injection, while compound 48/80 (1 mg/kg, i.p.) was injected for 3 days before the experiment to deplete histamine (Parratt & West, 1957).

In control animals the oedema developed slowly, although an increase in volume was measured after ½ h, and reached its maximum in 3 h.

Both mepyramine (5 mg/kg, i.p.) and compound 48/80 (1 mg/kg, i.p. × 3 days) pretreatment reduced the early (P 0·001 and 0·01 respectively) and the delayed phase of swelling at 3 h ($P < 0·01$ and 0·001 respectively). Bromolysergic acid (3·2 mg/kg, i.p.) pretreatment failed to inhibit the early phase of rat paw oedema at the end of ½ h (P 0·1) but it significantly reduced delayed phase of the oedema at the end of 3 h (P 0·01).

Acetylsalicylic acid (50 mg/kg) or trasylol (20,000 units/kg) failed to inhibit the oedema after ½ h (P 0·2 and 0·9 respectively), but did so at 3 h ($P < 0·01$).

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