Roxithromycin: Its Effects on Concanavalin-A Induced Spleen Cell Proliferation and Interleukin Production in Mice

M.	Mitsuru	Adachi
S.-i.	Shin-ichi	Konno

First Department of Internal Medicine, School of Medicine, Showa University, Tokyo Japan

Key Words

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Correspondence to: Dr. Mitsuru Adachi, Department of Internal Medicine, School of Medicine, Showa University, Hatanodai Shinagawa-ku, Tokyo 142 (Japan)

We examined the effects of roxithromycin (RXM), a newly synthesized macrolide antibiotic, on allergic responses in mice. RXM was administered orally to BALB/c mice once a day for 42 days at a single dose of 5 mg/kg body weight. Spleen cells (SpCs) were collected from mice on days 7, 14, 28 and 42 post-RXM administration and their blastic activity in response to concanavalin A (ConA) stimulation was examined. They showed higher lymphocyte blastic activity than controls. The activity peaked on the 7th day, then gradually decreased, and returned to the control level by the 42nd day. Production of cytokines, interleukin (IL)-2 and IL-5, by SpCs in response to ConA stimulation was also examined in the course of RXM administration. The capacity of SpCs to produce IL-2 was enhanced by oral administration of RXM for 28 days. However, long-term (42 days) administration inhibited it. On the other hand, the capacity of SpCs to produce IL-5 was strongly inhibited by oral RXM throughout the administration period. It has been reported that murine helper T lymphocytes can be divided into two distinct populations, designated Th1 and Th2 on the basis of their different cytokine production and functions: Th1 cells produce IL-2 and interferon- γ and mediate delayed-type hypersensitivity, and Th2 cells produce IL-4 and IL-5 and help IgE production by B cells. Taking into consideration these findings, our results strongly suggest that oral administration of RXM inhibits the function of Th2-type helper T lymphocytes. Th1-type helper T lymphocytes also seem to be inhibited, but this inhibition seems to take time to manifest. The two distinct helper T cell populations have recently been reported in humans, and these data may help predict the effect of drugs in human asthma therapy. Asthma and atopic allergy are characterized by infiltration of a large number of activated eosinophils and the presence of elevated concentration of eosinophil-derived soluble mediators. IL-5 is now known to induce specific recruitment of eosinophils, and the IL-5-suppressing action of RXM suggests that long-term administration of RXM may be beneficial in asthma and allergy treatment.