

Infection of *Helicobacter pylori* in rats and mice: A one year study

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Abstract

AIM: To investigate the long term infection of *H. pylori* in the conventional laboratory rats and mice, and the serological responses of the infected-animals.

METHODS: Two strains of *H. pylori* (one vac positive and one vac negative) were separately isolated from two duodenal ulcer patients. The bacteria were considered as mouse-adapted strains after they have passaged through the mice 3 times serially. Groups of female BALB/c mice and Sprague-Dawley rats were separately inoculated with mouse-adapted vac⁺ or vac⁻ *H. pylori*. The animals were treated with omeprazole before and after the bacterial inoculation in order to increase the gastric pH. Then the animals were sacrificed 2 wk, 2, 6-7 or 12 mo after the bacterial inoculation. At sacrifice, blood was sampled for ELISA; mucosa from the corpus and the antrum were separately scraped off, and cultured in order to determine the colony forming units (CFUs).

RESULTS: *H. pylori* colonized the gastric mucosa in most of the

bacteria-inoculated mice and rats, and the colonization was rather constant 2 to 12 mo after *H. pylori* inoculation. In the mice, CFUs were around 200/mg scraped mucosa in the antrum and were around 100/mg in the corpus. There were no differences of colonization between vac⁺ and vac⁻ strain s. Two mo after the bacterial inoculation, the serum level of *H. pylori*-specific Ig in the mice infected by vac⁺ *H. pylori* was progressively and significantly increased up to 10-15 times higher than that in the uninfected controls, while was only slightly increased in the mice infected by vac⁻ *H. pylori*. In the rats, 2 to 12 mo after the bacterial inoculation, CFUs were around 1000/mg in the antrum, while only 2-52/mg in the corpus. Serum levels of *H. pylori*-specific IgG2a were persistently and significantly increased in the rats infected by vac⁺ *H. pylori* in comparison with the uninfected controls ($P < 0.05$ to < 0.001), while IgG1 in these *H. pylori* infected rats remained at control levels.

CONCLUSION: The conventional laboratory mice and rats can be infected by the mouse-adapted *H. pylori* strains. Serological response was significant in vac⁺ *H. pylori* infected mice, but not in vac⁻ *H. pylori*-infected mice. The significantly increased serum *H. pylori*-specific IgG2a antibody in the rats infected by vac⁺ *H. pylori* showed a strong predominance of an inflammatory Th1-type response.

Key words: *Helicobacter pylori*; Helicobacter infection; Rats; Mice

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