

KJ-20 Study on anti-*Helicobacter pylori* urease IgY: in vitro pepsin resistance and passive protection against *H. pylori* infection in mouse model

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[BACKGROUND]

Helicobacter pylori (*H. pylori*) is one of the most common chronic bacterial infections in humans, affecting half of the world's population. Infected people may develop gastritis, gastric ulcer or even gastric cancer. Current therapy regimes use a combination of 2-3 antibacterial medicines and a proton pump inhibitor but fail in 10-20% of cases due to the increasing drug resistance. Oral administration of egg yolk immunoglobulin Y (IgY) has been reported as a means of effective immunotherapy for *H. pylori* infections, but its protective mechanism in stomach needs to be clarified. In this study, we investigated the in vitro resistance of purified IgY against pepsin in low pH medium and its suppressive effect against *H. pylori* in a challenged mouse model.

[METHODS]

Recombinant urease antigens were prepared and used to immunize chicken hens to generate anti-HP urease IgY. The purified IgY was mixed with simulated gastric fluid (SGF, pH 4.1) containing pepsin and then incubated at 37° C for 10 h with constant shaking. Samples were collected every hour and the residual antibody activity was measured by enzyme-linked immunosorbent assay (ELISA). NS:Hr/ICR hairless mice were infected with *H. pylori*, treated with various doses of anti-HP IgY and the number of the bacterium in stomach was assessed.

[RESULTS]

Anti-HP IgY showed strong resistance against pepsin during SGF digestion treatment retaining intact structure up to 9 hours. In the same condition mammalian IgG showed lower pepsin resistance compared to IgY completely disappearing in SDS-PAGE after 9 h of digestion. Anti-HP IgY significantly reduced the number of *H. pylori* in NS:Hr/ICR hairless mice challenged with *H. pylori* and improved inflammation level in gastric mucosa.

[CONCLUSIONS]

Chicken egg yolk IgY is highly resistant to pepsin in stomach and shows good suppression against *H. pylori* in a mouse challenge model. Considering the various advantages of IgY, the antibody could be useful as a novel therapeutic and prophylactic agent for controlling *H. pylori* infections in humans.

[Key Words]

Helicobacter pylori urease, IgY, passive immunotherapy