

## *H. pylori* recurrence after successful eradication

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### Abstract

Recurrence of *H. pylori* after eradication is rare in developed countries and more frequent in developing countries. Recrudescence (recolonization of the same strain within 12 mo after eradication) rather than reinfection (colonization with a new strain, more than 12 mo after eradication) is considered to be responsible for most of the cases. This observation was confirmed only in developed countries, while in developing countries a recent meta-analysis demonstrated a high rate of reinfection. The proportion of *H. pylori* annual recurrence was 2.67% and 13.00% in developed and developing countries, respectively. Nested meta-analysis (only cases with a longer follow-up and a negative <sup>13</sup>CUBT a year after eradication) revealed annual recurrence rate of 1.45% [relative risk (RR), 0.54] and 12.00% (RR, 0.92) in developed and developing countries, respectively. These findings support the notion that in developed countries many cases of recurrence are due to recrudescence within the first year after eradication, with a 46% drop in the recurrence rate after the first year post eradication, while in developing countries reinfection is more pronounced, and continue at the same rate since eradication. A different approach for follow-up after *H. pylori* eradication is probably needed in patients of developing countries, since reinfection is highly prevalent.

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**Key words:** *Helicobacter pylori*; Eradication; Recurrence; Recrudescence; Reinfection

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A definite cure of peptic disease and prevention of ulcer complications, as well as cure of mucosa-associated lymphoid tissue (MALT) lymphoma, is dependent on successful eradication of *H. pylori*. Thus, recurrence of infection should be taken seriously into consideration.

More than 120 studies were published in the medical literature about recurrence of *H. pylori* till today, and found a wide range of recurrence rates<sup>[1-5]</sup>. The 12-mo recurrence rate varies in different studies, from 0% to 41.5% or more<sup>[5]</sup>. In a recent 7-year follow up study the annual recurrence rate of *H. pylori* infection after a successful eradication in Israel was only 0.55%<sup>[6]</sup>. This may be explained by the fact that studies are extremely different in design, diagnostic methods, and population base.

Recurrence of *H. pylori* after a successful eradication is rare in developed countries and more frequent in developing countries<sup>[1]</sup>. Recrudescence (recolonization of the same strain) rather than reinfection (colonization with a new strain) is considered more likely to be responsible for most of the cases<sup>[5]</sup>. But this belief is based on heterogeneous methods, using different approaches. Recrudescence is a clinical problem, a result of treatment failure. Reinfection is considered a problem of preventive medicine, and should be dealt in a different way. An accurate diagnosis is difficult, and mostly relies on molecular fingerprinting techniques, confirming that the identified bacteria, before and after therapy, are genetically identical<sup>[1]</sup>. Using this strategy it was found that recurrence was due to recrudescence in up to 80% of the cases<sup>[7]</sup>. Nevertheless, the possibility that reinfection with a strain common to family members or another close contact, cannot be ruled out. The case may be even more complicated since different strains may be sometimes isolated from the same host<sup>[8]</sup>, and microevolution can be observed at a high frequency. Recrudescence is most likely to occur during the first year after eradication, while reinfection may account for recurrence after a year from the eradication therapy. Heavy contamination of the environment and sources such as in drinking water, institutionalized patients, medical personnel or family members, may be the source of reinfection, especially in developing countries<sup>[7]</sup>.

*H. pylori* infection and recurrence examined with many laboratory methods, such as <sup>13</sup>C-urea breath test (<sup>13</sup>CUBT), <sup>14</sup>C-urea breath test, stool antigen test, urease test, histology or culture. In addition, successful eradication measured by a negative test in different periods after the treatment. While most authorities believe that 4 wk time span is enough to confirm eradication<sup>[9]</sup>, some investigators believe that this time should oscillate between 10 wk and 14 wk<sup>[11]</sup>. A recent meta-analysis<sup>[10]</sup> overcame the bias of changing approaches and different strategies, including 17 papers that used <sup>13</sup>CUBT in adults, with a minimum follow up of 12 mo<sup>[2-4,11-24]</sup>. In addition, studies that examined *H. pylori* recurrence after a negative <sup>13</sup>CUBT, at least a year post eradication treatment, were looked at separately. The proportion of *H. pylori* annual recurrence was 2.67% and 13.00% in developed and developing countries, respectively. Nested meta-analysis (only cases with a longer follow-up and a negative <sup>13</sup>CUBT a year after eradication) revealed annual recurrence rate of 1.45% [relative risk (RR), 0.54] and 12.00% (RR, 0.92) in developed and developing countries, respectively. These findings support the notion that in developed countries many cases of recurrence are due to recrudescence within the first year after eradication, with a 46% drop in the recurrence rate after the first year post eradication, while in developing countries reinfection is more pronounced, and continue at the same rate since eradication.

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