Urease, Gastric Bacteria and Gastritis

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Urease is an enzyme produced by diverse bacterial species including normal flora, non pathogens, and pathogens such as *Proteus mirabilis*, *Staphylococcus saprophyticus*, *Klebsiella pneumonia*, *Citrobacter freundii*, *Enterobacter cloacae Helicobacter spp* and *Helicobacter pylori*.[1-4] Urease is central in *Helicobacter pylori* metabolism and virulence, important for colonization in the gastric mucosa.[1] Urease catalyzes the hydrolysis of urea to ammonia and carbamate. This ammonia product can be examined by Urease biopsy test and Urea breath test such as ^{14C}-Urea Breath Test or ^{13C}-Urea Breath Test.[1]

Previously, the Urea breath test was intended to detect an increase in ammonia which is a urease product in the gastric mucosa produced by pathogenic gastric bacteria, such as *Helicobacter pylori*, etc.[1-7]

Acute and chronic gastritis caused by infection with these pathogenic bacteria infection turned out to be positive on Urea breath test.[8-11] Indirectly, the results of the urea breath test are also related to the presence of inflammation in acute and chronic gastritis, regardless of whether the cause is Helicobacter pylori or other urease-producing pathogenic bacteria.[7,8]

The use of the urea breath test indirectly in diagnosing acute and chronic gastritis should be studied further. The use of the urea breath test is indeed very important to assist health services in countries and regions with limited endoscopic facilities, especially developing countries.

We know that the prevalence of *Helicobacter pylori* infection in causing acute and chronic gastritis by examination of Urea breath test in Indonesia is not too high, ranging from 2-11.2%.[5] So that is why more studies on *non-Helicobacter pylori* producing urease pathogens are needed, which can appear as a false positive urea breath test.

Miftahussurur M et al.[5] in their research on 95 dyspeptic patients at Soetomo Hospital Surabaya Indonesia found that the urease levels of positive patients with acute and chronic gastritis were higher than negative patients ($p = 0.001$, $r = 0.353$; $p < 0.0001$, $r = 0.433$). The AUC values of 14C-UBT for detecting acute, chronic, and atrophic gastritis were 0.889, 0.632 and 0.544, respectively. They concluded that 14C-UBT is an adequate diagnostic modality to predict acute or chronic gastritis but not atrophic gastritis.

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