

Non-Invasive Diagnosis of *H. Pylori* Infection

Sir,

Since Barry Marshall described the *Helicobacter pylori* (*H.pylori*) and its role in different gastrointestinal diseases, an intense research effort has developed different diagnostic methods. The only non-invasive test method that can be clinically used as a diagnostic tool for ongoing infection with *H.pylori* and post-eradication follow-up is the "Urea Breath Test." With the Heliprobe™ a cost-effective test is available. The Urea Breath Test (UBT) is based on the fact that the *H.pylori* produces an enzyme, Urease, which catalyses the hydrolysis of the urea molecule into ammonium and carbon dioxide. *H.pylori* requires the alkaline ammonium in order to establish an optimal local mucosal environment within the acidic environment of the stomach. The urea compound is an endogenous substance that contains one carbon atom, normally ^{12}C , which can be replaced by its isotope ^{14}C or ^{13}C . Heliprobe™ uses the isotope ^{14}C which has very low beta-radioactive emission. The radioactive dose used for a Heliprobe™ test is 1 micro curie, which is significantly less than the radioactive dose given at a normal X-Ray examination of the stomach.

Patient is called in the morning after overnight fasting. A Helicap (1 microcurie capsule of C^{14} -urea) is ingested with 50 ml of water. If an infection with *H.pylori* is present in the stomach, the "living" bacteria produces the enzyme "urease" that metabolizes the ^{14}C -urea into ammonium and carbon dioxide containing the ^{14}C -labelled atoms. The carbon dioxide will be assimilated through the mucosa into the blood stream and transported to the lungs where it is exhaled. By collecting the exhaled carbon dioxide in the Breath Card™, the amount of $^{14}\text{CO}_2$ produced in the stomach can be measured with the Heliprobe™ instrument. If the patient is not infected, no metabolization of urea will occur, and no $^{14}\text{CO}_2$ can be detected with the Heliprobe™ system. In this case, the un-metabolized ^{14}C urea will pass along the digestive canal to be excreted in the urine. If the Heliprobe™ system detects $^{14}\text{CO}_2$, this is diagnostic evidence of an ongoing infection with living *H.pylori*. Heliprobe™ is developed for primary diagnosis of *H.pylori*, as well for follow-up after eradication treatment. This test has 95% sensitivity, 100% specificity & 98.4% accuracy. The anti-secretory drugs if taken by the patients should be stopped 1 week

prior to test. *H.pylori* has etiological role in ulcer (gastric & duodenal) and non-ulcer dyspepsia, gastric cancer, unexplained iron deficiency anaemia, and recurrent pain in the abdomen in children. *H.pylori* also has etiological role in migraine, rheumatoid arthritis, weight & height restriction in children, skin disorders-acne, urticaria, psoriasis and lichen planus, cardiovascular disorders, neurodegenerative disorders- parkinsonism & gynaecological disorders- infertility, hyperemesis gravidarum & IUGR and other gastrointestinal disorders- gall stones, cholangiocarcinoma, cirrhosis & colorectal carcinoma.

Triple drug *H. pylori* eradication therapy is advised in positive cases, but we give lactulose which causes lactic acidosis after digestion by colonic bacteria. Lactic acid is secreted by stomach mucosa which bursts the cloud of ammonia around *H. pylori*, thus exposing the bacteria to strong acid. To make acid strong, antisecretory drugs should be stopped 1 week prior to lactulose therapy.

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