Russian-Style Hunting For Helicobacter Pylori

October 21 2005

Due to the 2005 Nobel Prize in physiology and medicine received by Robin Warren and Barry Marshall, the name of the Helicobacter pylori bacterium is now a buzz word. According to contemporary overview, the bacterium gets into the stomach with food and water. In adverse conditions (stress, malnutrition, genetic factors, etc.), the bacterium invades the wall of the stomach or the duodenum under the mucous membrane and produces toxins destroying the walls. This is how gastritis originates, turning into ulcer.

It is fair to say that the Helicobacter pylori bacterium does not cause gastritis and ulcer with all their hosts. There will always be some percentage of people resistant to some bacterium or virus. But if gastritis or ulcer symptoms are clear, then it is sufficient to determine the Helicobacter pylori presence to start treatment (which is by the way well-developed).

Previously, to diagnose the disease, patients had to endure an extremely unpleasant procedure (gastroscopy) –swallowing a stomach pump. The procedure is not only unpleasant, but also dangerous: it traumatizes the larynx and esophagus. Besides, a stomach pump can bring some infection in the patient's organism if it has not been properly sterilized.

Researchers from the Branch of the Karpov Physicochemical Research Institute (Obninsk) suggest their own technique for hunting the Helicobacter pylori. The technique is based on the bacterium's propensity, the bacteria is fond of urea and decomposes it quickly,

carbonic acid gas being formed along with that. The patient can be offered some urea and then the content of his/her exhalation can be researched. But the problem is that we always breathe out carbonic acid.

The Obninsk researchers suggest that carbonic acid from urea should be "marked" - the C-14 radioactive isotope of carbon should be introduced in the urea. It is sufficient to add to urea insignificant quantities of the "marked" urea to make the method work. The analysis looks as follows: the patient swallows an ordinary capsule containing a small shot of "Uracaps C-14" preparation. If the Helicobacter pylori lives in the patient's stomach, it would start to decompose urea intensely. 20 minutes later, the patient is offered to breathe out into the dryer tube (similar to the alcohol test tube). Then special absorption solution washes up the tube content, a little liquid is placed on the plate and the substance activity is observed on the beta-spectrometer. If the patient's exhalation contains "marked" carbonic acid, the spectrometer would immediately recognize that, and the computer will produce the analysis outcome: whether the bacteria are present in the stomach or not.

"Many people are scared of the word "radioactive", says Yuri Sorokin. But in this case, we deal with a negligible dose: a capsule of the "Uracaps C-14" preparation is equivalent to a person's stay in common sunlight for 12 hours. Nevertheless, we are now developing the special "Carbocaps C-13" preparation for children and pregnant women. It contains nonradioactive carbon isotope C-13, but it can be identified in the exhalation only with the help of the NMR-spectrometer ."

Source: Informnauka (Informscience) Agency