New finding of the expression of Helicobacter pylori in Chilean patients

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Helicobacter pylori (H. pylori) colonize the human stomach and present genetic mechanisms to evade the host immune response allowing their persistence in this habitat for years. A study involving 130 H. pylori strains isolated from patients living in different Chilean cities revealed that, nearly half of them carry the hopE and hopV genes. The results suggest that these genes can be turned on and off, and are likely to be involved in avoiding immune recognition.

Helicobacter pylori (H. pylori) is the causal agent of chronic gastritis, ulcer and gastric cancer. It has the potential to persist in the human stomach for decades, sometimes causing neither harm nor clinical symptoms. Nevertheless, on some occasions, depending on the host immune system and the strain causing the infection, the outcome can be very serious. To maintain the infection, the bacterium must adapt to survive the host defences. One way to accomplish this is to sequentially change the external proteins on the bacterial surface.

A research article to be published on January 21, 2010 in the World Journal of Gastroenterology addresses this topic. As part of a search for adequate antigens to generate a vaccine against H. pylori, a group lead by Dr. Alejandro Venegas studied 2 potential targets, HopE and HopV outer membrane proteins, which function as porins. The study revealed that out of 130 H. pylori strains, 60 and 82 of them possessed the hopE and hopV genes, respectively, but only 16 and 9 actually expressed them and synthesized the respective proteins. In other words, 73% and 90% of the hopE and hopV detected genes were turned off. In addition, roughly

10% of H. pylori-infected patients develop immunoreactivity against HopV or HopE, which confirms the low number of strains expressing them. These proteins are part of a larger family, with which they share sequence homology, so their genes are redundant. These genes could be turned alternatively on and off, and this strategy may allow the bacteria to display, at the same time, different external proteins and distract the immune system by directing its attacks to proteins which will be replaced again as needed.

This study provides some understanding of one of the mechanisms the persistent bacteria H. pylori uses to evade the immune system. The authors' efforts have been oriented to generate a vaccine against H. pylori, and although HopE and HopV are too infrequently expressed in clinical strains and so are not ideal candidate as antigens, they induce a good immune response (as tested in rabbits) and could be used in combination with other proteins in a multivalent vaccine. More research is needed to determine a strong immunogenic epitope or group of epitopes to direct the immune response towards H. pylori outer membrane proteins.

More information: Lienlaf M, Morales JP, Díaz MI, Díaz R, Bruce E, Siegel F, León G, Harris PR, Venegas A. Helicobacter pylori HopE and HopV porins present scarce expression among clinical isolates. World J Gastroenterol 2010; 16(3): 320-329

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