Detection of Bacteria Helicobacter pylori in Water: Possible Link with Gastric Cancer

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The association of Helicobacter pylori and gastric cancer has been scientifically established. IARC classified H. pylori as a Group 1 carcinogen in 1994, and reconfirmed it in 2009 (IARC 2014). Approximately 89% of non-cardia gastric cancer cases are estimated to be associated to chronic H. pylori infection. Sources and vehicles of transmission for H. pylori bacteria are poorly understood. Knowledge of its transmission mode is important to prevent its spread and reduce gastric cancer. Baker et al. (2001) and Aziz et al. (2013) have suggested environmental water sources as mode of transmission. Determining the presence of this bacteria in Puerto Rico has only been done in marine coastal waters (Holman et al. 2013), even though there is high prevalence of H. pylori infections and gastric cancer (Ortiz et al. 2010). This is the first attempt to determine if there are traces of H. pylori in environmental surface waters. Samples of influents and effluents were collected at the Caguas Regional Wastewater Treatment Plant. Total bacterial DNA was extracted and analyzed by PCR for presence of UreC gene from H. pylori. A positive control, consisting of DNA isolated from H. pylori, and a negative control, consisting of DH10B E. coli, were analyzed in parallel. Results revealed presence of UreC gene only in the positive control and not in the influents, effluents or negative control, indicating that possibly H. pylori is not abundant enough to be detected by standard PCR analysis. Thus, the transmission of H. pylori in environmental water sources remains unclear.

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