COMMENTARY

Helicobacter pylori Screening to Prevent Gastric Cancer: an Economical Analysis for a Tropical Developing Country

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Abstract

Gastric cancer is an important gastrointestinal carcinoma. Presently, it is accepted that the strongest etiological relationship is with *Helicobacter pylori* infection. Screening for the bacterium thus becomes an issue for discussion in gastric cancer prevention. Here, the author covers the use of *H. pylori* screening as a strategy based on an economical analysis in the scenario of a tropical developing country.

Keywords: *H.pylori* screening - gastric cancer - prevention - economic analysis

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Introduction

Of the several kinds of gastrointestinal cancer, gastric neoplasia continues to be of great importance throughout most of the world, including tropical countries (Balint, 1990; León-Barúa, 2000). Presently, it is accepted that gastric cancer has a strong relationship to *Helicobacter pylori* infection. According to the clinical practice guideline (Fock et al., 2009), the recommended first-line therapy for *H. pylori* infection is combined amoxicillin/ metronidazole and clarithromycin for 7 days.

Screening for *H. pylori* has become a new issue in gastric cancer prevention (Leung et al., 2008). Fock et al (2009) reported that *H. pylori* screening and further eradication in risk populations might help reduce gastric cancer incidence. Here, the author studies and discusses the use of *H. pylori* screening as a strategy for gastric cancer prevention based on economical analysis in a scenario of a tropical developing country.

Materials and Methods

This study was designed as a descriptive study. A medical economics model was used and the primary setting is Thailand, a developing country in Thailand. The cost utility study was used. The primary assumption was set for 1,000, 000 population at early adulthood (20 years old). First, the cost of screening, the usage of *H. pylor*i antibody screening, was reviewed. The standard cost on the reference laboratory in Bangkok (Special Laboratory) was quoted. For the utility, the author firstly identified the naïve chance of having positive result from screening and naïve chance of further development of gastric cancer. Further identification on the reduction of the mean lifetime cancer risk due to screening was done and this was further used for simulation to the naïve case to find the change for further development of cancer after application of screening policy. The utility in this work is the chance for reduction of gastric cancer. Finally, the cost per utility was calculated.

The primary assumption was set for 1,000,000 population at early adulthood (20 years old) for allowing of further prediction of reduction of the mean lifetime cancer risk for gastric cancer. The simulation is applied the condition of routine *H.pylori* screening and further proper treatment of positive case. The reduction of the mean lifetime cancer risk due to screening was referred to the previous study (Yeh et al., 2009) (equal to 14.5 % and 26.6 % for males and females). The chance for having positive *H.pylori* is referred to the previous report on the prevalence in Thailand (Perez-Perez et al., 1990). The chance for further development of gastric cancer is referred to the previous report on the prevalence of gastric cancer among the Thai (4.1/10-5 and 2.6/10-5 for males and females) and the prevalence of gastric cancer cases with positive *H.pylori* (68 %) (Thong-Ngam et al., 2001; Suwanrungruang et al., 2008).

Results

The cost for *H.pylori* in the setting is equal to 10 US dollar. Based on the set primary assumption, the identified chance for having positive result from screening and chance of further development of gastric cancer in naïve and simulated situation are presented in Table 1. According to the economical model, the total cost for screening is equal to 10,000,000 US dollars. The utility for screening is equal to 4.04 and 4.70 cases/1,000,000 screenees in reduction for gastric cancer development in males and females. The finalized cost per unit utility (in 1,000,000 people scale) is equal to 2,475,248 and 2,127,660 US dollars for males and females. For individual scale (1

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Table 1. Chances (per 10^6 population) of a Positive Result from Screening and Further Development of Gastric cancer in Naïve and Simulated Situations

Chance	Naïve		Simulated situation	
	Male	Female	Male	Female
Positive *H.pylori*	5.5 x10^4		5.5 x10^4	
Gastric cancer	27.9	17.7	23.8	13.0

case), the unit cost is equal to 2.48 and 2.16 US dollars.

Discussion

Similar to any kind of cancers, a reduction of the risk for cancer becomes an important tool in preventive oncology. Screening for *H. pylori* which is proved as a factor leading to future development of gastric cancer is considered to be an important tool in cancer prevention (Hamashima et al., 2008; Leung et al., 2008). However, the implementation of routine screening is still questionable due to the lack of complete clinical and economical data. Leung et al proposed that 'Despite the strong link between infection with *Helicobacter pylori* and gastric cancer, more data are needed to define the role of its eradication in the prevention of gastric cancer in Asia'. Here, an economical analysis of using *H. pylori* screening for prevention for gastric cancer in Thailand, a developing country in Thailand was performed.

Indeed, there are some recent reports on cost effectiveness on using routine screening the bacterium for prevention of gastric cancer. Yeh et al (2009) recently studied the primary site in China and reported that the screening program was acceptable for prevention of gastric cancer. In an earlier study in the USA, where the incidence of gastric cancer is lower than China, it was still found that routine *H. pylori* screening had the proved health benefits at a reasonable cost at moderate rates of excess risk reduction of cancer (Fendrick et al., 1999).

In this work, the author performed economical analysis of the scenario of Thailand and can identify the usefulness of screening for reduction of gastric cancer. In a million populations scale, a reduction in about 4 cases of gastric cancer can be detected. However, the unit cost of performing of the screening might be the big obstacle for implication of routine screening, since at about 2 US dollars is about a half of daily salary of the general workers in Thailand. How to introduce a cheaper screening test, which might be a local made diagnostic tool, might be the solution that helps implement the routine *H. pylori* screening in Thai population.

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