

## Helicobacter Pylori Infection in Bhutan



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### Abstract

Bhutan is a small landlocked country in South Asia. The incidence of gastric cancer in Bhutan was relatively high among Asian countries. We visited Bhutan 3 times during 2010-2015 and performed upper GI endoscopies in 1,142 dyspeptic patients (372 patients from the Middle West part [Thimpu, Punaka and Wangdue], 472 patients from the Middle East part [Trongsa and Bumthang] and 298 patients from the West part of the country [Ha]). Overall *H. pylori* infection was 756/1,142 (66.2%). Chronic gastritis, peptic ulcer diseases and gastric cancer were common findings in this country. High incidence of these upper GI diseases in Bhutan may contribute to high prevalence of *H. pylori* infection. Therefore, eradication therapy for *H. pylori* infection and improvements in sanitation could be effective ways to lower the incidence of *H. pylori*-related upper GI diseases in this country.

**Keywords:** *Helicobacter pylori*, Bhutan

*Helicobacter pylori* (*H. pylori*) is a gram-negative bacterium that colonizes the human stomach, and is recognized to play an important role in the pathogenesis of various upper gastrointestinal diseases including gastritis, peptic ulcer, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma.<sup>1-3</sup> Infection with *H. pylori* almost always results in chronic gastritis, but only a small population of infected patients have developed into more severe diseases such as peptic ulcer and gastric cancer. Interaction between host, bacteria and environment factors might be key processes for developing disease outcomes. In Asia, gastric cancer is still a main health problem and the prevalence of gastric cancer geographically varies greatly between each location.<sup>2,3</sup>

Bhutan is a small landlocked country in South Asia, located at the eastern end of the Himalayas and shares borders with the South, East and West with the Republic of India and to the North with the People's Republic of China. Bhutan has a population of 700,000 with an area of 38,816 Sq.m. The terrain consists mostly of steep and high mountains with elevation ranging from 660-23,000 ft. The ASR of gastric cancer in Bhutan was reported to be 24.2/100,000 being relatively high among Asian countries.<sup>4,5</sup> Although several studies focused on the prevalence of *H. pylori* infection conducted in many countries with different socioeconomic, cultural, and racial groups,<sup>6,7</sup> the prevalence of *H. pylori* infection in Bhutan has not been investigated. We disclosed the infection rate of *H. pylori* in Bhutan and these findings can be used as baseline epidemiological data for further research to understand the epidemiology of *H. pylori* infection in Bhutan and Asian countries.

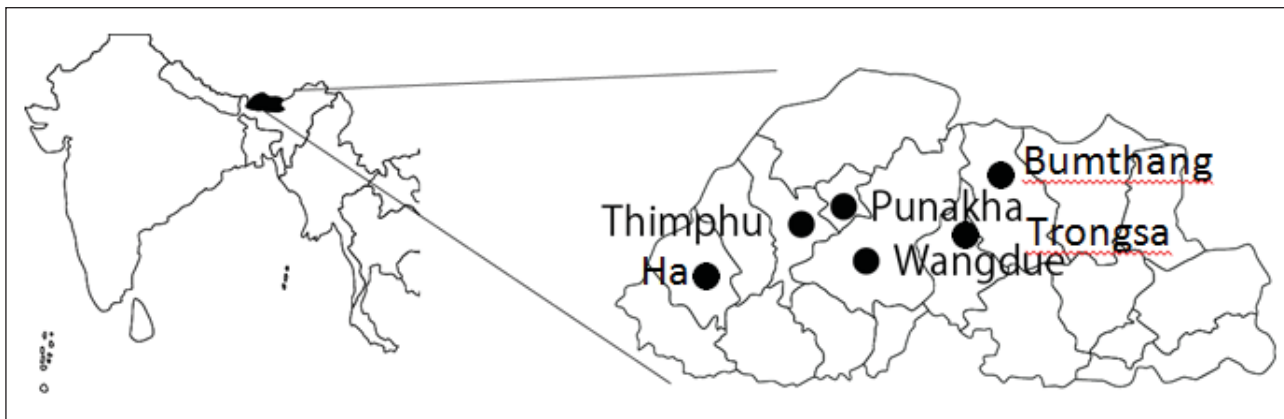
### Prevalence of *H. pylori* infection in Bhutan

We went to Bhutan 3 times for the Thailand-Japan-Bhutan Gastric cancer and *H. pylori* Project (Gastrosocopy camp) between 2010-2015 (Thimpu, Punaka and Wangdue in December 2010, Trongsa and Bumthang in October-November 2014 and Ha in April 2015) as shown

in Figure 1. We recruited a total of 1,142 dyspeptic patients (372 patients from the Middle West part [Thimphu, Punaka and Wangdue], 472 patients from the Middle East part [Trongsa and Bumthang] and 298 patients from the West part of the country [Ha]. Overall *H. pylori* infection was 756/1,142 (66.2%). The prevalence of *H. pylori* infection was 273/372 (73.4%) patients in the Middle West part, 311/472 (65.9%) patients from the Middle East part and 172/298 (57.7%) patients from the West part of the country. Details regarding the *H. pylori* infection and endoscopic findings in each location is shown in Table 1.

**Explanation of high *H. pylori* infection in Bhutan**

We demonstrated that the prevalence of *H. pylori* in Bhutan was 66.2%. In contrast with developed countries, *H. pylori* infections occur earlier in life and with a higher frequency in the developing world.<sup>4,5</sup> While the prevalence of the infection has dropped significantly in many parts of North America, Western Europe and some countries in Asia, no such decline has been noted in the developing world.<sup>4</sup> The possible explanation might be from poor economic status and sanitation in many develop-



**Figure 1:** Cities/Areas in Bhutan.<sup>4</sup>



**Figure 2:** Punaka, Bhutan compared between 2010 and 2015.

**Table 1:** Prevalence of *H. pylori* infection in each diagnosis and location.

Locations (n)	Gastritis	PUD	Gastric cancer	<i>H. pylori</i> infection (%)
<b>Middle West Area (372)</b> Thimphu, Punaka and Wangdue	312 (83.9%)	30 (8.1%)	5 (1.3%)	273 (73.4%)
<b>Middle East Area (472)</b> Trongsa and Bumthang	390 (82.6%)	31 (6.6%)	11 (2.3%)	311 (65.9%)
<b>West Area (298)</b> Ha	260 (87.2%)	21 (7%)	4 (1.3%)	172 (57.7%)

ing countries. A high infection rate was demonstrated in Bhutan which is mostly rural and isolated. Poor sanitary conditions in these areas such as inadequate water supply and sewage treatment are considered as possible explanations. The high prevalence of *H. pylori* infection in Bhutan might be a reason why this country has a high incidence of chronic gastritis, peptic ulcer disease and gastric cancer.<sup>4,5</sup>

**Conclusion**

High incidence of gastric cancer in Bhutan may contribute to a high prevalence of *H. pylori* infection. Therefore, any eradication therapy of *H. pylori* could lead

to a drop in *H. pylori*-related upper GI diseases such as chronic gastritis, peptic ulcer diseases and gastric cancer. However, we should remain cautious when considering any *H. pylori* eradication therapy in Bhutan. Even when eradication therapy for *H. pylori* is successful, infection frequently reoccurs in patients in developing countries where there is a high prevalence of *H. pylori* infection.<sup>4</sup> Recurrent infection is either a repeat of the original infection or reinfection with a new strain. The most important move should be an attempt to improve sanitary conditions across the country to decrease the prevalence of *H. pylori* in Bhutan.



**Figure 3:** Members of the Thailand-Japan-Bhutan Gastric Cancer/*H. pylori* Project, Gastroscopy camp.



**Figure 4:** Gastroscopies in Bhutan.



Figure 5: Endoscopy room (5A) and Bhutanese patients waiting for gastroscopies (5B).

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