

# CAN DIAGNOSIS OF HELICOBACTER PYLORI BE RAPID AND YET SENSITIVE?

Pages with reference to book, From 103 To 104

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## ABSTRACT

Diagnostic accuracy of 5 tests viz., endoscopy, rapid urease, 24 hours urease, culture and histology, were evaluated in the detection of Helicobacter pylori (H. pylori) infection in 50 patients undergoing upper G.I. endoscopy. Endoscopic evidence of gastritis to predict H. pylori infection was 50% specific and 46% sensitive. Rapid and 24 hours urease test and culture were 100% specific when compared with histology and their sensitivity was 71 %, 62% and 21 % respectively. Of the three 100% specific tests, rapid urease test yields results within 15 minutes; therefore this test being easy, rapid and sensitive should be used for screening of H. pylori infection; followed by histology for further confirmation (JPMA 41: 103, 1991).

## INTRODUCTION

Several diagnostic techniques for the detection of H. pylori infection have been established: H. pylori can be cultured from biopsy specimens using both selective<sup>1-3</sup> and non-selective<sup>4,5</sup> media, with varying<sup>2,3,6</sup> rates of positivity. Histology is yet another mode of identification of H. pylori in gastric mucosal biopsy specimens. Recently, several staining techniques have been described<sup>7-13</sup> but the choice usually depends upon the local experience and facilities rather than on differences in sensitivity or other advantages<sup>10</sup>. A characteristic feature of H. pylori is the production and excretion of urease<sup>14</sup>, which has been used for the rapid diagnosis of H. pylori colonization. The validity of rapid urease and 24 hours urease test is well established<sup>15-17</sup>. In this study we have compared the sensitivity and specificity of histology with endoscopy, culture, rapid urease and 24 hours urease tests to see which one is more useful for diagnosis of H.pylori infection.

## PATIENTS AND METHODS

Fifty patients undergoing upper gastrointestinal endoscopy for the symptoms of peptic ulcer were included in the study. Patients with gastrointestinal bleeding, liver and renal disease, malignancy and those on steroids or antimicrobial agents were excluded. Five antral biopsies were taken 2cm from the pylorus from each patient. Two were sent in 5 ml buffered formalin for histology, one in 0.5 ml normal saline for culture, and urease tests were done on two specimens. Rapid urease test was performed on the biopsy using 10% urea solution, and kept for 15 minutes before discarding. Twenty-four hours urease test was done using 2% Christensen broth and read after 18-24 hours. Four sections of paraffin embedded biopsy specimens were stained by haematoxylin and eosin (H & E) for histological diagnosis and Giemsa stain for H. pylori. Specimen for culture was immediately inoculated after grinding on moist chocolate agar plates and incubated in an anaerobic jar having 8% carbon dioxide, 7% oxygen and 85% nitrogen produced by using Helicobacter gas packs. A high humid atmosphere was produced by placing water at the bottom of the jar. Cultures were kept for 10 days before

discarding. Change in the atmospheric environment was made after every 4 days. Cultures were considered positive for *H. pylori* if one or more colonies of Gram negative, oxidase positive, catalase-positive and urease-positive spiral or curved rods appeared. The sensitivity, specificity and positive and negative predictive values were calculated for each test and compared with histology. In addition, patients positive and negative for *H. pylori* on histology were compared with the test after logarithmic transformation.

## RESULTS

Of 50 patients, endoscopic gastritis was present in 23 (46%) cases. Histologic evidence of chronic gastritis and *H. pylori* was present in 48 (96%) cases, while the remaining two patients had normal histological features without any evidence of gastritis or *H. pylori*. Rapid urease test was positive in 34 (68%), 24 hours urease test in 30 (60%) and culture was positive in 10 (20%) cases. Sensitivity, specificity, and the positive and negative predictive values of these tests are given in the table.

TABLE I.

Histological diagnosis of gastritis	Endoscopy		Rapid urease test		24 hours urease test		Culture		Histology	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Positive	22	26	34	14	30	18	10	38	43	5
Negative	1	1	-	2	-	2	-	2	-	2
Sensitivity (%)	46		71		62		21		90	
Specificity (%)	50	100	100		100		100		100	
Positive Predictive value (%)	96		100		100		100		100	
Negative Predictive value (%)	4		12		10		5		29	

## DISCUSSION

Detection of *H. pylori* by culture of gastric mucosal biopsies and histology is time consuming; requiring at least 3-6 days. Urease test using 2% Christensen's urea broth still takes about 4-24 hours<sup>16</sup>, which delays the decision for specific treatment. As most of our patients are poor who travel long distances for the diagnosis of their upper G.I. symptoms, it is difficult for them to visit our unit frequently or to stay in town till the results become conclusive. To avoid inconvenience to these patients rapid urease test was established so that treatment could be advocated at the same sitting. In the present study sensitivity and specificity of various diagnostic tests for the detection of *H. pylori* were compared to see which test gave a rapid and yet accurate diagnosis. Histology is the most reliable method of diagnosis described so far. In one study<sup>14</sup> 77 - 100% positivity has been shown with five different stains. In our study using H & E stain positivity was 96%. Sensitivity and specificity of histology was 90 and 100% respectively which is superior to other four tests. Rapid urease test was 71% sensitive and 100% specific in the present study. The sensitivity and specificity of 24 hours urease test was also similar to the previous reports<sup>17</sup> but its sensitivity in our study was lower than rapid urease test. Present study has shown that 96% of patients with dyspeptic symptoms had histological gastritis with *H. pylori* infection even though more than half of them had apparently normal mucosa on endoscopy. Therefore, endoscopy had a poor diagnostic value<sup>18</sup> in the detection of gastritis due to *H. pylori*, as is evident from its low sensitivity and specificity when compared with the other test. Different methods of culture

have shown 37- 54% positivity<sup>1,3,6</sup>. In this study it was 100% specific but only 21% sensitive due to high false negativity which may be due to indiscriminate use of antibiotics which may have hindered the growth of this sensitive organism. Thus, in our environment rapid urease test is a good screening test which can be performed in the endoscopy unit and treatment started S immediately.

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