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Comparison the Sensitivity of Stomach Mucus Touching Cytology and Urease Rapid Test in *Helicobacter Pylori* Diagnosis in Endoscopies Patients with Gastritis or Peptic Ulcer

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Implication for health policy/practice/research/medical education:
Due to gained results from this study, it is proposed to use of stomach mucus touching cytology as the first step of early diagnosis of H. pylori among inpatients in hospitals. It can be also used for outpatients because it has the same sensitivity as histology and also it is simple, fast, cheap and available and can prevent the problems of no treatment and wasting time and money for H. pylori diagnosis. It is proposed to do this study in outpatients to gain more reliable statistics by comparing the stomach mucus touching cytology and urease rapid test

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Dear Editor,

Helicobacter Pylori (H. pylori) is microaerophile bacterium that colonizes the human gastrointestinal tract. It is found in the deepest parts of mucus gel that covers stomach mucus or between mucus layer and stomach epithelium (1, 2). *H. pylori* is one of the proved causes of some prevalent diseases like different kinds of gastritis (chronic, acute, atrophic), peptic ulcer and also dangerous diseases like stomach lymphoma and adenocarcinoma and estimated to be responsible for approximately 65% of all stomach cancers worldwide (3-5).

There are different diagnosis methods for *H. pylori* that the most spread ones are: histology of stomach biopsy sample, smear assessment of stomach biopsy sample, culture, serum assessment of bacteria antibodies, urease rapid test, urea breathing test and assessment of discharged antibodies of bacteria. Among these methods; histology of stomach biopsy sample is the most characteristic and sensitive one which is called "Golden Standard". But it is expensive and its results reveal after a few days (1, 2). Stomach mucus touching cytology and urease rapid test are adequately characteristic and sensitive and also fast, inexpensive and available (1, 2, 6).

As present studies report that the specificity of stomach mucus touching cytology and urease rapid test are the same (approximately 100%) and due to the importance of the assessment of these two tests sensitivity; we decided to assess their sensitivity (6-10)

As present studies report that the specificity of stomach mucus touching cytology and urease rapid test are the same (approximately 100%) and due to the importance of the assessment of these two tests sensitivity; we decided to assess their sensitivity (6-10). The main aim of our study is a Comparison between the sensitivity of stomach mucus touching cytology, urease rapid test and histology in *H. pylori* diagnosis in endoscoped patients in Ekbatan Hospital of Hamadan.

The present study is an analytic comparative research and sample gathering is futuristic. Samples volume was 120 cases (appointing the sample volume upon statistic formula was not possible because of the difference between the diagnosis value of stomach mucus touching cytology in previous studies (6, 10, 11). Thus, 120 cases were chosen according to the similar studies and practical problems. Statistic population was the endoscoped inpatients with gastritis or peptic ulcer in Ekbatan Hospital of Hamadan in one year.

To do this study; two biopsy samples were taken from stomach entre of the patients with gastritis or peptic ulcer. One of the samples was sent for stomach mucus touching cytology (sign of pressed sample on the slide) and urease rapid test, and the other sample was sent for pathology. The taken sample of stomach mucus touching cytology was firstly put on a slide and lightly touches an alcohol-clean class slide repeatedly in serial adjacent area with the cut surface of the tissue. As each slide is prepared, dry it rapidly by waving it in the air. For standardization purposes, fix (after drying) in methyl alcohol, and then both slides were fixed by alcohol 90% and were put in the slide basket.

At the end of each day; all fixed slides were sent to the lab for Giemsa staining. After staining they were assessed for *H. pylori* under the microscope by a pathologist. After stomach mucus touching cytology, the sample on the first slide, was put in the urease rapid and solid kit by a sterile needle. Test results were assessed after 24 hours. The second biopsy sample was dropped into the biopsy jar filled with formalin and was sent to the pathology section. The gained results of these two methods - stomach mucus touching cytology and urea rapid test –were filled in a questionnaire and were compared with histology as a "Gold Standard". Assessment of histology and stomach mucus touching cytology was done by the same pathologist.

Among 120 under study patients;72 persons were men (60%) and 48 were women (40%). 19.16% of these patients were between 17-40 years old. 31.66% were between 40-60 and 45.83% were between 60-80 and 3.33% were over 80 years. The average age was 57/58±17 and they were between 17-87 years old. Among these patients; 92 persons (76.7%) had gastritis and 28 patients (23.3%) had peptic ulcer. Among these patients; 83 persons (69.17%) had *H. pylori*, from which; 60 patients (72.29%) had gastritis and 23 patients (27.71%) had peptic ulcer. Sensitivity of urease rapid test for *H. pylori* diagnosis was 31.33%.

Sensitivity of stomach mucus touching cytology in this study was 100% (Table 1). In the patients with gastritis; sensitivity of urease rapid test for *H. pylori* diagnosis was 33.33% and sensitivity of stomach mucus touching cytology was 100%. In the patients with peptic ulcer; sensitivity of the urease rapid test for *H. pylori* diagnosis was 26.08% and sensitivity of stomach mucus touching cytology was 100% (*Table 2*). There was no false positive case in Stomach mucus touching cytology and urease rapid test in this study.

Table 1. Comparison of Stomach Mucus Touching Cytology and Urease Rapid Test to Matching Histology in *H. pylori* Detection

Stomach Mucus Touching Cytology	Histology		
	Positive	Negative	Total
Positive	83	0	83
Negative	0	37	37
Total	83	37	120
Ureaserapid test			
Positive	26	0	26
Negative	57	37	94
Total	83	37	120

Table 2. Comparison Sensitivity of Stomach Mucus Touching Cytology and Urease Rapid Test in *H. pylori* Diagnosis in Patients with Gastritis or Peptic Ulcer

	Sensitivity of Urease Rapid Test, %	Sensitivity of Stomach Mucus Touching Cytology, %
Gastritis	33.33	100
Peptic ulcer	26.08	100
All patients (Gastritis and peptic ulcer)	31.33	100

In this study we compare sensitivity of stomach mucus touching cytology and urea's rapid test in diagnosis of *H. pylori* in endoscoped patients. In our study sensitivity of stomach mucus touching cytology was 100% which is very high and equal to histology as a gold standard method in diagnosis of *H. pylori*. The high sensitivity of stomach mucus touching cytology in *H. pylori* diagnosis was the same as in previous studies. Misra *et al*. (12) report that the sensitivity of stomach mucus touching cytology was equal to the histology (100%), which was taken as the gold standard. In study of Trevisani *et al*. (9) reported that stomach mucus touching cytology has sensitivity of 100%.

That both of these studies have similar results to our investigation. But in another study, Rahbar *et al*. (13) report that the sensitivity of stomach mucus touching cytology was 96.6%. Yasar *et al*. (14) report the sensitivity of stomach mucus touching cytology was 93.3%. This difference can be explained by higher sample size in these studies in comparison to our investigation. Biopsy of different part of the stomach could be another cause, we use of the biopsies from the entry of stomach but Rahbar *et al*. and Yashar *et al*. use of antral biopsies. Low sensitivity of urease rapid test was also the same as previous studies (10, 11).

Due to this study on inpatients and possibility of presence of some destroyable conditions for urease rapid test, like using of protein pomp inhibitors (PPI) bismuth and antibiotics, and gastric hemorrhage, that cause false negative in rapid urease test (RUT) and decrease the test sensitivity (2), and considering the high sensitivity of stomach mucus touching cytology and its big difference with the sensitivity of urease rapid test, it is concluded that stomach mucus touching cytology is the best method for *H. pylori* diagnosis among inpatients. Otherwise, considering stomach mucus touching cytology as a simple, fast, cheap and available test for *H. pylori* diagnosis (7, 10, 11); it can be easily taken place of urease rapid test among inpatients.

Due to gained results from this study, it is proposed to use of stomach mucus touching cytology as the first step of early diagnosis of *H. pylori* among inpatients in hospitals. It can be also used for outpatients because it has the same sensitivity as histology and also it is simple, fast, cheap and available and can prevent the problems of no treatment and wasting time and money for *H. pylori* diagnosis.

It is proposed to do this study in outpatients to gain more reliable statistics by comparing the stomach mucus touching cytology and urease rapid test. It is also advised to do other studies with more cases and comparing other *H. pylori* diagnosis tests like urea breathing test and serology methods with stomach mucus touching cytology.

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Author Contribution

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