EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 4
Issue: 7
109-111
Year: 2017

RELATIONSHIP BETWEEN TONSILLITIS AND COLONIZATION OF HELICOBACTER PYLORI IN TONSILLAR TISSUE

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Article Received on 08/05/2017 **Article Revised on 28/05/2017** **Article Accepted on 18/06/2017**

ABSTRACT
Aim: The aim of the current study is to investigate whether tonsillar tissue of patients with tonsillitis plays a reservoir role for *Helicobacter pylori (H. pylori)*. **Background**: Recently, there have been arguments regarding *Helicobacter pylori* (*H. pylori*) colonizing tonsillar tissue. **Patients and methods**: This study was performed on 98 patients with diagnosis of tonsillitis, 30 (30.7%) were female and 68(69.3%) were male. Presence of *H.pylori* detected by rapid urease test (RUT) and Haematoxylin and Eosin technique (H&E). **Results**: Of all patients only 3 (2.9%) were found positive for *H. pylori* while 95(97.1%) of patients were negative for *H.pylori* using RUT. with H&E technique the colonization detected was (0%) in 60 (58.8%) of patients from both sex. **Conclusion**: There was no significant correlation between tonsillitis and positivity of *H.pylori*. Our results did not support the role of tonsils as a reservoir for *H.pylori*.

KEYWORDS: *Helicobacter pylori*, tonsil, colonization, RUT, H&E.

INTRODUCTION
Helicobacter pylori (*H.pylori)* is a micro-aerophilic, Gram negative, slow growing, spiral shaped and flagellated organism. Its most characteristic enzyme is a potent multi-subunit urease that is crucial for its survival at acidic pH and for its successful colonization of the gastric environment, an area that few other microbes can colonize. *H. pylori* infection is probably the most common chronic bacterial infection of humans, present in almost half of the world population.[1]

The transmission of *H. pylori* bacterium is not yet well understood, but the oral–oral and the fecal–oral are the most common routes of transmission. Although culture of *H. pylori* from the oral cavity has been inconsistent. *H. pylori* is known to be involved in the pathogenesis of various disease conditions, such as duodenal ulcers, gastric conditions, IgA nephropathy and gastric adenomas with various host reservoirs for continued persistence of the organism. The human palatine tonsil has been proposed as one of the extra gastric reservoirs of *H. pylori* and various studies have been undertaken to study its role. Other studies dispute the fact that the human palatine tonsil may be an extra gastric reservoir of *H. pylori.*[2] Various theories have been advanced to explain how *H. pylori* is able to colonize, adapt and persist in host tissue. These include the fact that it mayadhere to epithelial cells and induce a strong inflammatoryresponse which does not lead to elimination of the organismbut causes a chronic inflammation which leads tohyperkeratosis which makes the penetration of antibiotics difficult in the affected tissue.[2], [3]

MATERIAL AND METHODS
Prospective study done on 98 patients from both sexes in different age undergoing tonsillectomy from February to May 2017 in Al doha E.N.T Specialist Hospital in Khartoum. Randomized tonsil biopsy was collected directly in the theater after bilateral tonsillectomy. The biopsy was divided into two parts; one has been Placed in 10% formalin fixative and the other in urea broth medium.

Rapid urease test
The basis of this test is the ability of *H.pylori* to secrete the urease enzyme which catalyzes the conversion of urea to ammonia and carbon dioxidesampling. The test was performed at the time of tonsillectomy. A biopsy of tonsil was taken and phenol red as indicator. The urease produced by *H.pylori* hydrolyzed urea to ammonia, which raised the PH of the medium. The color change from yellow to pink considered positive result and no color change as negative result.[4]

Haematoxylin and Eosin technique

All remnants of tonsils were sent to histopathology department and studied by histopathology's. Specimen was fixed in 10% formalin then goes through tissue processing set (dehydration by ascending sequence of alcohol, clearing in xylene and then impregnated in paraffin wax). Block was forming using paraffin wax. The tissue was been sectioning by rotary microtome in 4-5 micrometer thickness then stained by haematoxylin and eosin (dewaxation by xylene, rehydration by descending sequence of alcohol stained the nucleus by mayer`shaematoxylin bluing in amonical water, stained the cytoplasm by eosin then dehydrated by ascending sequence of alcohol, clearing in xylene mounting by DPX then examined under microscope 40x).[5]

RESULTS

Ninety eight patients were recruited for this study. Sixty eight Patients were male while thirty were female. Presence of *H. pylori* by RUT and based on color change was in three samples. sixty samples from all were tested using H&E and no presence of colonization by *H.pylori* was detected. (Table 2).

Table(1); Baseline characters

male	68 (69.3%)
female	30 (30.7%)

Table (2); Presence of *H. pylori* by rapid urease test and Haematoxylin & Eosin

test	positive	negative	Sum
RUT	3(2.9%)	95(97.1%)	98
H&E	0(0%)	60(60%)	60

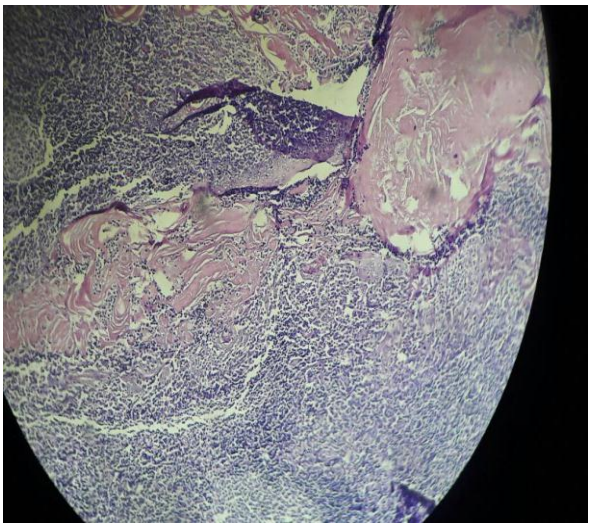

Figure (1); Tonsillar tissue stained by Haematoxylin & Eosin stain showing on presence of *H.pylori* colonization

DISCUSSION

There is a great concern about the rate of *H. pylori* in causing various disease. The *H. pylori* is attracting increased attention because it is increasingly found in various parts of the body due to its ability to change the micro-environment. This study found (2.9%) of patients having *H.pylori* colonization in their tonsillar tissue with RUT, the current study disagrees with Monem et al.[2] who studied 30 children who were diagnosed with tonsillitis and (53.3%) were found to be positive for *H.pylori* using RUT. Another study by Nam et al.[2] on 98 patients with recurrent tonsillitis found an overall prevalence of (62%) positivity for *H. pylori* using RUT**.** In a study of tonsil and adenoid tissue from 23 patients, Cırak et al. found (30%) positive PCR results for the presence of *H. pylori*. These studies support *H. pylori* colonization in tonsil and adenoid tissue. However, studies showing no significant *H. pylori* colonization are also available. In a study of 139 specimens, Jelavic et al. determined that(12%) had *H. pylori* present using RUT, which shows low prevelance and agrees with the current study. Eyigor et al. found three samples (5.5%) from 35 adenoid and 20 tonsil samples with positive CLO tests. The same study found no positive results from PCR investigations. In a study of 101 surgical specimens, Vilarinho et al. found no positive results with PCR-DEIA tests.[6] Generally The infection rate with *H. pylori* in the pharynx is higher in patients with stomach ailment histories than in patients without stomach ailment histories, suggesting that chronic pharyngitis may be related to stomach ailment history.[7] False positive results from Rapid Urease Test (RUT) are known from the literature. In medical practice, negative results with the urea breath test suggest that the stomach infection of *H. pylori* is cured in these patients. In fact, patients can present negative urea breath test results and yet exhibit *H.pylori* infection due to oral infection.[8]

Histology was the first method used for the detection of *H.pylori*. H&E has the advantage of visualizing both inflammatory reaction and presence of *H.pylori* but its sensitivity is often influenced by the site, number and size of biopsies.[9]

The current study did not detect any presence of *H.pylori* in tonsillar tissues with H&E technique. In a study done by Jiang- Piang Zhang found that the number of *H.pylori* was so few to be detected by modified Giemsa stain.[10]

As a conclusion the low prevalence of *H.pylori* colonization in this study may be due to small sample size, different ages, variation in stage of illness and Sufficient antibiotic treatment that interfere with appropriate interpretation of tests result. It seems that RUT is highly specific but is not sensitive enough for diagnosis of *H.pylori* colonization in tonsillar tissue[11], therefore type of diagnostic methods also contribute in the sensitivity and specificity of testing, also cross-reactivity that may lead to either false positive or negative results. Combination between different diagnostic methods to investigate the *H.pyolri* colonization should be done in order to obtain more reliable results.

CONCLUSION

Colonization of tonsils by *H.pylori* has low incidence among tonsillectomy patients. Further studies including molecular techniques will need to be performed.

ACKNOWLEDGMENT

We would like to express our deepest gratitude to medical microbiology department, faculty of medical laboratory sciences- university of Khartoum.

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