

## Extra Gastric Hematological Display of Helicobacter Pylori Infection

ZERTAJ KASHIF<sup>1</sup>, TOOBA FATEEN<sup>2</sup>, FAIZA SHAFQAT<sup>3</sup>, SEHAR SHAMSHAD ALI<sup>4</sup>, SAADIA LATIF<sup>5</sup>, SAADAT PARVEEN<sup>6</sup>, SONIA ZAFAR WARRIACH<sup>7</sup>

<sup>1</sup>Associate Professor Pathology, Bakhtawar Amin Medical & Dental College, Multan

<sup>2</sup>Assistant Professor Pathology, University of Child health sciences & The Children hospital Lahore

<sup>3</sup>Assistant Professor, Bakhtawar Amin Medical & Dental College, Multan

<sup>4</sup>Senior Demonstrator, Bakhtawar Amin Medical & Dental College, Multan

<sup>5</sup>PGR Haematology, CMH Multan

<sup>6</sup>Professor Hematology Department, Bakhtawar Amin Medical & Dental College, Multan

<sup>7</sup>Consultant Doctor, DHQ Jhang

Correspondence to: Zertaj Kashif, Email: [zkashif786@icloud.com](mailto:zkashif786@icloud.com), Cell: 0314 6121201

### ABSTRACT

**Objective:** To scrutinize extra gastric associations of Helicobacter Pylori (H Pylori) infection with disorders those come under hematology domain.

**Design:** Descriptive cross sectional

**Place and duration:** Histopathology and hematology department of Bakhtawar Amin Medical & Dental College and Trust hospital, Multan from Jan 2021 to Dec 2021

**Material and methods:** Complete blood count (CBC) and peripheral blood microscopic examination were done in every histopathologically approved H Pylori positive patient to record hemoglobin (Hb %), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) and platelet count. Serum Iron, serum ferritin, serum Vitamin B 12 and folic acid levels were done in suspected cases only. Patients with low platelet count were checked in detail for immune thrombocytopenic purpura (ITP). The CBC samples were taken twice once at the time of delivery of histopathology report and second time after treatment of H Pylori infection to check reversal of counts and peripheral blood changes for authentication of H Pylori association with these blood changes. The test results along with the essential details like age, gender, nutritional history, previous medical history esp. related to these disorders and menstrual history in females were recorded on excel sheet and the proportions of all the variables were calculated to extract appropriate tables and figures.

**Results:** Out of total 132 gastric biopsies received in Histopathology department Helicobacter Pylori prevalence noted to be 78.8 %. Eighty three (79.8 %) out of 104 H Pylori positive cases revealed extra gastric hematological manifestations and in 59 (56.7 %) of these patients the blood indices along with peripheral blood picture returned to normal on H Pylori eradication.

**Conclusion:** A large number of H Pylori positive patients displayed hematological manifestations that reverted to normal on taking H Pylori treatment. H Pylori should be kept in mind especially dealing cases of unexplained iron deficiency, vitamin B12 anemia and Immune thrombocytopenia.

**Keywords:** Helicobacter Pylori infection, iron deficiency anemia, histopathology, platelets, vitamin B 12 deficiency anemia, serology

### INTRODUCTION

Helicobacter Pylori is a spiral shaped gram negative bacteria responsible for infection in the gastrointestinal tract in more than half of the world population.<sup>1,2</sup> According to certain researches, the probability of having H Pylori infection in developing nations is very high up to 90% as compared to developed nations (up to 50%).<sup>3</sup>

In Pakistan the delineated incidence fluctuates between 50-90 % according to various age groups; being highest in adults above 60 years.<sup>4,5</sup>

Apart from serious gastric manifestations like chronic gastritis, gastric/duodenal ulcers, gastrointestinal adenocarcinomas and lymphomas, H Pylori is known to be involved in causing a number of other systemic disorders including those related to blood prominently iron deficiency anemia (IDP), vitamin B 12 anemia and immune thrombocytopenia (ITP).<sup>6,7,8</sup>

Several studies reveal a relation between H pylori and normocytic normochromic, iron deficiency and macrocytic Vitamin B 12 deficiency anemia. This association is more significant in elderly patients with multimorbidities.<sup>9,10,11</sup>

Vitamin B 12 deficiency is a well recognized manifestation of H Pylori induced chronic gastritis.<sup>12</sup> Immune thrombocytopenia (ITP) mediated by the immune response and presented as temporary short term or long lasting reduction in blood platelet count (less than  $100 \times 10^9$ ) is also known to be associated with H Pylori infection.<sup>6,13</sup>

All these researches reveal that elimination of H Pylori via therapy elevates platelet counts in some ITP patients, and also reciprocates iron therapy with increase in ferritin level in iron deficiency patients.

However, the part played by H Pylori in causing these disorders is not absolutely clear and consistent plus the statistics are not in harmony if we compare the results of various countries and regions regarding extra gastric hematologic manifestations of

H Pylori. Also the studies scrutinizing the link between the bacteria and extra gastric blood related disorders are extremely lacking especially in our region. This prompted us to delineate the extra gastric hematological disorders linked to H Pylori in this region with special focus on iron deficiency anemia, vitamin B 12 deficiency anemia and immune thrombocytopenia.

### MATERIAL AND METHODS

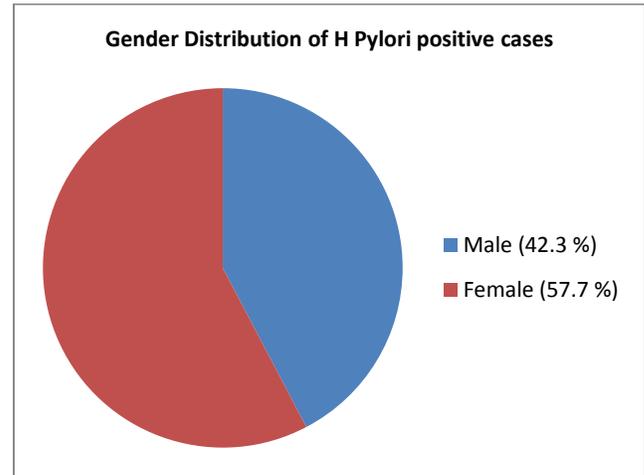
This descriptive study was conducted at Pathology department of Bakhtawar Amin Hospital Multan over a period of one year from July 2020 to June 2021. Every histopathologically confirmed H Pylori positive patient was included in this study. EDTA samples, for complete blood count and peripheral blood microscopic examination, of all these patients were taken and reviewed specifically for hemoglobin level, Mean corpuscular volume (MCV), Mean corpuscular hemoglobin (MCH), Mean corpuscular hemoglobin concentration (MCHC) and platelet counts. Those who found to have low hemoglobin along with low MCV, MCH & MCHC along with microcytic hypochromic picture on peripheral blood examination were investigated for serum iron and ferritin levels to rule out iron deficiency anemia. Those with low hemoglobin levels and high MCV, MCH & MCHC along with macrocytes on peripheral blood examination were further examined for Vitamin B 12 and folic acid deficiency. Patients with low platelet counts were thoroughly scrutinized for ITP. The blood samples were taken in H Pylori positive patients only, at the time of issuance of histopathology reports and repeated again after complete eradication of H Pylori to examine any shift of blood count and peripheral smear changes back to normal to prove the substantial role of H Pylori with these hematological disorders. Patient's demographic particulars, previous histories of any such disorder, nutritional history, socioeconomic status, menstrual history in females, and all the relevant histopathological and hematological

investigations were noted. For histopathological confirmation of H Pylori, Hematoxylin and Eosin (H&E) stained slides were viewed along with Giemsa stain. All the findings were noted in a predesigned excel sheet. Percentage and means were calculated. Relevant tables and charts were figured.

## RESULTS

A sum of 132 gastric biopsies was received in histopathology department with complaints of severe gastritis and dyspepsia. Out of these 132, 104 (78.8 %) were found to be positive for Helicobacter Pylori on H & E and Giemsa stain. Forty four (42.3 %) were males and 60 (57.7%) were females. The mean age found was 40.8 years. Forty six (44.2%) of these H Pylori positive patients revealed blood counts and peripheral findings suggestive of iron deficiency anemia. Out of these 46 patients, twenty eight (60.9 %) patients had no other disorder associated with iron deficiency anemia and the blood count along with peripheral findings reverts to normal after H Pylori eradication. Thirty five (33.6%) patients showed megaloblastic peripheral picture, blood counts and Vitamin B 12 values related to B 12 deficiency anemia. The blood picture and counts returned to normal in thirty (85.7 %) patients after complete treatment of H Pylori. Only two (1.9 %) patients discovered to have low platelet count without any other

obvious reason and in one of them, platelet number increased on H Pylori eradication.



Percentage and proportion of H Pylori positive male and female patients having Iron deficiency anemia, B 12 deficiency anemia and immune thrombocytopenia.

	H Pylori positive cases	No. and percentage of patients with iron deficiency anemia	No. and percentage of patients with Vit. B12 deficiency anemia	No. and percentage of patients with low platelet count (ITP)
Males	44 (42.3%)	19 (41.3%)	18 (51.4 %)	02 (100 %)
Females	60 (57.7%)	27 (58.7%)	17 (48.6 %)	-
Total	104 (78.8 %)	46 (44.2 %)	35 (33.6 %)	02 (1.92 %)

Percentage of cases with counts reverting to normal upon H Pylori treatment

Hematologic Disorder	No. and percentage of cases with treatment effect	No. and percentage of cases with no treatment effect	Total No. and percentage of cases
Iron Deficiency Anemia	28 (60.9 %)	18 (39.1 %)	46 (44.2 %)
Vitamin B 12 Deficiency Anemia	30 (85.7 %)	5 (14.3 %)	35 (33.6 %)
Immune thrombocytopenia	01 (50 %)	01 (50 %)	02 (1.92 %)

## DISCUSSION

This research was conducted to evaluate the commonness of H Pylori in dyspeptic patients of Multan region and its connection with iron deficiency anemia, Vitamin B 12 anemia and immune thrombocytopenia. The prevalence of H Pylori in our study found to be quite high (78.8 %) that is consistent with several other studies conducted in various regions of Pakistan. (4, 14, 15, 16)

The absolute association of H Pylori with iron deficiency anemia was 26.9% and total percentage of patients with findings suggestive of iron deficiency anemia was 44.2 %, corresponding to studies by Haile K et al, Rahat A et al, Monzon H et al and Rostami-Nejad M. (17, 18, 19, 20)

However, much higher link (up to 61.5%) was outlined by Demerdash DM et al (21)

The current study revealed 35 (33.6 %) out of 104 H Pylori positive patients with findings suggestive of Vitamin B 12 deficiency anemia; out of which 30 (85.7 %) patients showed improvement in B 12 levels along with reversion to normochromic normocytic peripheral picture from previous macrocytic blood picture indicating a strong connection of H Pylori and B 12 deficiency anemia. This correlates well with several other studies conducted in various countries. (15, 22, 23, 24, 25)

In the current study, out of 104 H Pylori positive patients, only two were found to have low platelet counts with no other obvious reason and one of them responded well to H Pylori treatment with increase in platelet count. The response rate of (50%) in our study suggests an association between H Pylori and low platelet count. Several other researches carried out in various regions of the world claimed this association with variable percentages and responses to H Pylori therapy. (13, 25, 26, 27, 28)

The underlying mechanism of low platelet count due to Helicobacter Pylori is still not clear; however, the reason of iron deficiency anemia and Vitamin B 12 deficiency anemia might be the gastric damage related reduced absorption and blood loss due to ulceration and severe gastritis.

We believe this small scale study will serve as a gateway towards large scale studies involving majority of population of our region where both H Pylori and anemia are prevalent.

## CONCLUSION

A vast majority of dyspeptic patients turned out to be positive for H Pylori on histopathological examination and expressed extra gastric hematological disorders that returned to normal after complete H Pylori eradication, indicating a close association.

H Pylori testing should be included into anemia and idiopathic thrombocytopenia diagnostic workup in our country where anemia is quite common.

However, we believe that more large scale community based researches are required to establish the exact prevalence, basic underlying reason of these changes and the absolute efficacy of H Pylori treatment related response of these hematological changes.

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