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HELICOBACTER PYLORI INFECTION: AS A RISK FACTOR FOR ANEMIA, A PHYSIOLOGICAL PERSPECTIVE FROM SHAHEED BENAZIRABAD.

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Abstract:
Background: Helicobacter pylori infection is a very common entity these days in children and adults irrespective of the gender and religion and its impact on health is quite disturbing. The current study was planned and executed to evaluate the impact of H. Pylori infection on the hemoglobin levels and RBCs morphology and indexes. **Methods:** This case control study, carried out in the outpatient department of the People Medical College Hospital, Nawabshah, Sindh, Pakistan over 06 months. There were 384 study participants, 192 helicobacter pylori +ve patients and 192 healthy individuals as controls. Patients were randomly selected with an age ranging10 years to 60 years. Blood samples taken under aseptic measures were analyzed for hematological evaluations. **Results:** The mean age was 37.21+5.11 years in H-pylori infected individuals (Group-A) while it was 33.11+4.51 years in controls(Group-B). There were 168 males and 216 females among the study participants. A significant difference was observed in RBC count among the two groups, 3.1±1.0 x 10^6million/mm^3 and 4.8±1.9 x 10^6million/mm^3 in Group-A and Group-B respectively (p-0.03). Similarly significant difference was observed in MCV for the two study groups which was 71.04±7.1fl and 84.13±6.8 fl for Group-A and Group-B respectively (0.001). Significant statistical difference was found in MCH and RDW among the two groups.

Conclusion: H. Pylori infection significantly affects RBCs count and morphology which may lead to microcytic and hypochromic anemia in patients suffering from this infection.

Keywords: Helicobacter Pylori, MCV, RDW, Red blood cell morphology.

Introduction:

Gastrointestinal tract is continuously exposed to a variety of microbes and Helicobacter pylori is among the most common. It is a gram negative bacterium commonly found in stomach but may also be present in other body tissues[1,2]. The mucosal lining covering the inner surface of the stomach is disrupted by the H. pylori interfering the absorption of cobalamin and iron along with other nutrients[3,4]. It has helix like shape with a length of 3 micrometers and a diameter of 0.5 micrometers and it requires oxygen for its functions[5]. H. pylori infection has a global prevalence around 50% but it rises to 80%–90% in 3rd world countries while USA has a prevalence of 35%–40% while is much higher[6]. H. Pylori induced ulcers cause a significant morbidity in the society leading to socio-economic burden along with its complications ranging from anxiety, depression, nutritional deficiencies and perforations[7-9].

Observations suggest the relationship between H. pylori infection and the iron deficiency anemia as their coincidence is much more reported from developing nations countries suggesting the definitive role of this infection in the causation of anemia[10]. Red Blood Cell (RBCs) are produced by the bone marrow based on nutrients supply like proteins, iron, vitamin B12 and folic acid, cobal[11,12]. Helicobacter Pylori is thought to be utilizing the Ferritin as a source of energy depleting the stores of ferritin which results into iron deficiency anemia ultimately. It is also reported that the reduction in MCV (mean corpuscular volume) and Hb% (hemoglobin) and increase in TIBC (total iron binding capacity) occurs H. Pylori infection witnessed by peripheral blood smear showing microcytic and hypochromic RBCs[13]. No data was available from our region on this topic so we arranged this research study to fill this knowledge gape with the addition of new data on the concerned topic.

Methodology:

This study was carried out in the outpatient department of the People Medical College Hospital, Nawabshah, Sindh, Pakistan over 06 months from July 2017 to Dec 2017. There were 384 study participants, 192 helicobacter pylori +ve patients and 192 healthy individuals as controls. Patients were randomly selected with an age ranging10 years to 60 years. Patient with chronic GI diseases, Heart, Lung, Kidney and endocrine diseases were excluded from this study. The design of our study was case control with sampling selection through random sampling. Blood samples taken in EDTA (Ethylene diamine tetra acetic acid) containing tubes under aseptic measures and samples were analyzed for hematological evaluation using sysmex hematology auto analyzer whole process was performed under informed written consent. Data was analyzed on SPSS version 23 for measure of central tendency and measure of dispersion. Statistical tests applied were Chi-square and t-test for qualitative and quantitative variables respectively at a level of significance of p-value ≤ 0.05.

Results: The mean age was 37.21+5.11 years in H-pylori infected individuals (Group-A) while it was 33.11+4.51 years in controls(Group-B). There were 168 males and 216 females among the study participants. Most participants were from poor socioeconomic background (211), belonging to middle socioeconomic status were (120) whereas (53) participants belonged to upper socioeconomic status[Table-1]. A significant difference was observed in RBC count among the two groups, 3.1±1.0 x 10^6million/mm^3 and 4.8±1.9 x 10^6million/mm^3 in Group-A and Group-B respectively (p-0.03). Similarly significant difference was observed in MCV for the two study groups which was 71.04±7.1fl and 84.13±6.8 fl for Group-A and Group-B respectively(0.001). Significant statistical difference was found in MCH between the two groups, 20.55±2.6 and 28.2±2.7 picogram/cell for groups A and Group-B,p-value 0.001. MCHC was 25.61±2.8gm/dl in Group-A and 33.5±2.5gm/dl in Group-B with a statistically significant p-value 0.03. Red cell Distribution Width was elevated in Group-A 47.5±4.2fl in comparison to Group-B 38.4±3.2fl the difference was significant statistically p-value 0.001[Table-2].

Table-1: Demographic biodata of the participants

Parameters	Frequency and percentage
Male	168(43.75%)
Female	216 (56.25%)
Poor Socioeconomic status	211(54.95%)
Middle Socioeconomic status	120(31.25%)
Upper Socioeconomic status	53 (13.80%)

Table.2: Comparison of hematogical parameters between H. Pylori +ve and H.pylori –ve study participants

Variable	H. pylori +ve n=192	H. pylori -ve n=192	P-value
Red Blood Cell Count (million/mm^3)	3.1±1.0 x 10^6	4.8±1.9 x 10^6	0.03
Hemoglobin (gm/dl)	10.7±1.7	13.6±2.20	0.001
MCV (femtolitre)	71.04±7.1	84.13±6.8	0.001
MCH (picogram/cell)	20.55±2.6	28.2±2.7	0.001
MCHC (gram/dl)	25.61±2.8	33.5±2.5	0.03
RDW (femtolitre)	47.5±4.2	38.4±3.2	0.001

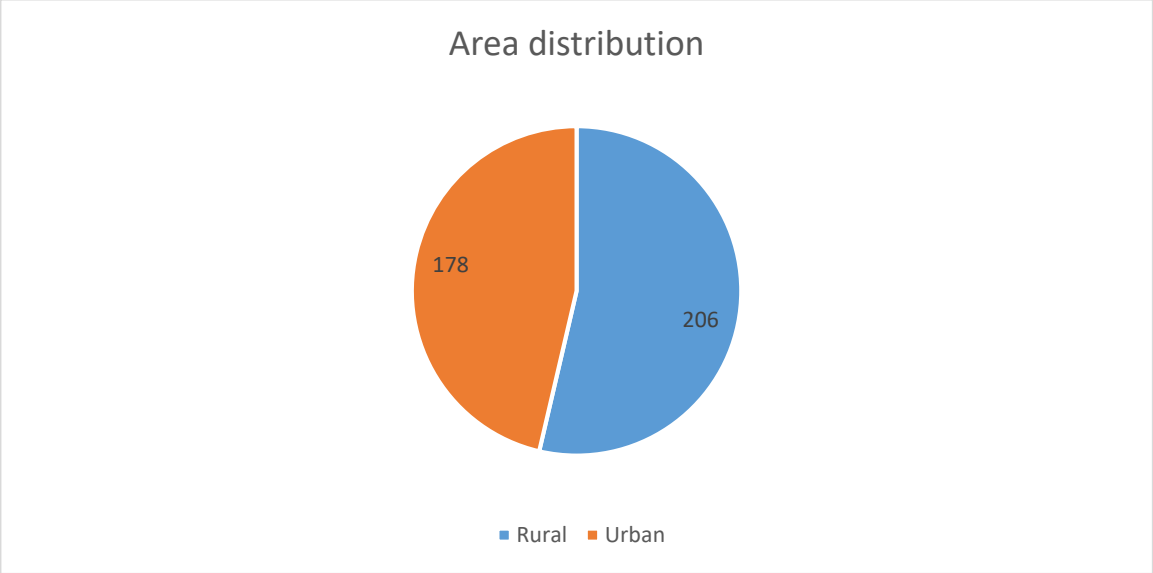

Fig-1: Area distribution of study participants

Discussion:

H. pylori infection has been a common problem for developing countries with evidence suggesting H. Pylori eradication gets corrects the resistant anemia due to iron defficiency[14]. Zakaria NH et al (2011) compared the H. Pylori Positive and H. Pylori negative groups of patients on the basis of hematological parameters and concluded H. Pylori infection decreasing the hemoglobin concentration, MCV and MCHC which is consistent with our results[15]. Sohail S et al (2014) studied the impact of H. Pylori on the serum iron and serum ferritin levels in patient with positive H. Pylori infection and non-H. Pylori positive cases they didn't find any statistically significant difference between the two groups,p value > 0.05 which is inconsistent with our findings[16].

A significant difference between the hemoglobin concentration of two groups was observed in our study 10.7±1.7 g/dl (Group A) and 13.6±2.20g/dl (Group-B) with p-value of 0.001 which is consistent with the findings of an Egyptian study by Ahmed et al (2019) who reported 10.35±1.6 g/dl in H. Pylori positive patients and 12.89±1.2 g/dl[17]. Xu MY et al (2017) also reported anemia in H. Pylori positive patients which is in accordance with our study findings[18]. However, studies conducted

so for point out or suggest that H. Pylori infection causes iron deficiency anemia possibly by reducing the iron absorption but the precise mechanism involved yet remains unaddressed. The other important issue is the hematological status of these H. Pylori positive patients before they were infected by this bacterium is not clear so there need of such study which move in forward direction and follow a particular group of normal volunteers over a time period to draw a valid conclusion. Although these results recommend that patients with H. Pylori infection should also be evaluated for anemia and similarly patient with anemia children or adults should also be evaluated for a potential infection by H. Pylori bacterium.

Conclusion:

Decrease in total RBCs count and Hemoglobin along with affects other RBCs indices was observed in patients with H. Pylori infection.

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