Original Article

Evaluation of Lipid Profile in *H. Pylori* Infected Coronary Artery Disease Patients

Mehk Memon¹, Nosheen Aghani¹, Waseem Akram², Ghulam Qadir³, Mehwish Memon⁴ and Mahrish Memon⁵

¹Department of Biochemistry, Peoples University of Medical and Health Sciences for Women, Nawabshah, Pakistan
²Department of Pathology, Peoples University of Medical and Health Sciences for Women, Nawabshah, Pakistan
³Department of Surgery, Peoples University of Medical and Health Sciences for Women, Nawabshah, Pakistan
⁴Bakhtawar Ameen Medical College, Multan, Pakistan
⁵Institute of Physiotherapy and Rehabilitation Sciences, Peoples University of Medical and Health Sciences for Women, Nawabshah, Pakistan

**ARTICLE INFO**

**Key Words:**
Triglycerides (TG), Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL), Total Cholesterol (TC)

**How to Cite:**
https://doi.org/10.54393/pbmj.v6i07.903

*Corresponding Author:*
Department of Biochemistry, Peoples University of Medical and Health Sciences for Women, Nawabshah, Pakistan
nosheenaghani@gmail.com

Received Date: 1⁷th, July, 2023
Acceptance Date: 2⁴th, July, 2023
Published Date: 3¹⁰th, July, 2023

**ABSTRACT**

Increase in low density lipoprotein level and decrease in high density lipoprotein level result to coronary artery disease. Metabolism of lipids regulated during host response to *H. pylori* infection. **Objective:** To analyze the serum levels of lipid profile in *H. pylori* infected coronary artery disease patients. **Methods:** It was a comparative Cross-Sectional study. This study was done at the Department of Biochemistry, Peoples University of Medical Health Sciences for Women(PUMHSW) from 1⁷th July 2022 to 1⁵⁰th December 2022. A sample of 80 subjects was divided into 2 groups. Group A (Control) comprised of 30 subjects and group B (cases) of 30 subjects. 5 mL of blood from each participant was collected under aseptic conditions. For the Lipid profile, 2 mL of the blood was collected in the Gel test tubes. A Spectrophotometer was used to perform the lipid profile. For the data analyzes SPSS Version-22.0 was used. **Results:** In this study we found that *Helicobacter pylori* positive subjects have higher levels of serum LDL-C, Triglycerides and total cholesterol. The outcomes of present research showed that *H. pylori* is associated with low level of HDL-C. The present study results shown an association among *H. pylori* infection and coronary artery possibility influence. **Conclusions:** We concluded in this study that serum levels of lipid profile become worse in positive *H. pylori* infected patients as compared to the control group participants which were negative *H. pylori* with coronary artery disease.

**INTRODUCTION**

*H. pylori* is a gram-negative bacterium, initially sequestered in gastric mucosa by Marshall and Warren in 1983 [1]. *H. pylori* had known to be the cause liable of maximum of the cases of gastric mucosal damage. Mostly *H. pylori* infection does not harm but most of times they are responsible for stomach ulcer and also ulcer of small intestine [2]. Coronary artery disease progresses once the main blood vessels come to be damaged or diseased. Cholesterol comprising deposits in arteries and inflammation leads to coronary artery disease [3]. The relation of coronary artery disease and *H. pylori* infection is based on 3 main evidences. Microbial, pathological and epidemiological mechanism of postulation [4]. There are many ways in which infection organism introduce and enhances atherosclerosis. This goes through protruding invasion into vessels wall causing response of inflammation which enhances macrophages, lymphocytes, cytokines production and factors of tissue growth [5, 6].
Lipoplysaccharides releases endotoxins due to systemic effect of infection cause release of lipopolysaccharides which ultimately damage to epithelium increase in cytokines with enhancing inflammatory parameters and stimulate procoagulants which leads to ischemia and thrombosis which all predisposes towards coronary artery disease [7]. Increase in low density lipoprotein level and decrease in high density lipoprotein level result to coronary artery disease. Metabolism of lipids regulated during host response to H. pylori infection[8]. Lipids show host defense with lipoproteins for infectious particles like endotoxins. This is mediated through cytokines like TNF a, interleukin 6, interleukin1 and interferon. Cytokines also decreases lipoprotein lipase activity and clearance of triglycerides and also increase very low-density lipoprotein levels [9].

**M E T H O D S**

This study was done at the Department of Biochemistry Peoples University of Medical Health Sciences for Women Nawabshah Shaheed Benazirabad (PUMHSW) from 1st July 2022 to 15th December 2022 along the cooperation with Medicine OPD/Ward PMCH. The analysis of sample had been done at diagnostic and research laboratory PUMHSW, Shaheed Benazirabad (SBA). Study design was comparative cross sectional. Sample technique was non probability purposive sampling. Both male and female subjects were included in the study which were diagnosed cases of Myocardial infarction from age 35 to 65 years with H. pylori infection and coronary artery disease. The patients with hepatic carcinoma, renal or hepatic failure and using drugs that affect the H. pylori were excluded. The sample size of study was based upon 60 subjects divided into two groups. Group A (Control) comprised of 30 participants with H. pylori negative coronary artery disease and group B (Cases) comprised of 30 participants with H. pylori positive coronary artery disease. We collected complete medical data and pertinent information from every subject through filling out a proforma. All participants gave verbal and written agreement after being informed about the study's purpose. Blood sample collection was done by venipuncture of the participants. 5 mL of blood from each participant was taken under aseptic conditions. For the Lipid profile, 2 mL of the blood was collected in the Gel test tubes. The blood was centrifuged for 10 minutes at 3500 rpm, fractionated, and conveyed to eppendorf cups before being stored at -20°C until analysis. The material was allowed to reach room temperature before being utilized. A Spectrophotometer was used to perform the lipid profile. For the data analyzes SPSS Version 22.0 was used. Results were shown as mean and standard deviation. Total cholesterol, HDL, LDL, TAG was performed using spectrophotometer. Lipoproteins are fractioned, after centrifugation, the supernatant contains chylomicron, which may be detected using the CHOD-PAP assay and lipid clearing factor (LCF) while LDL and VLDL were fractionated and precipitated by addition of polyethylene glycol (PEG). This study had been approved by the Review Committee of PUMHSW Nawabshah.

**R E S U L T S**

Total 60 cases of coronary artery disease were analyzed and they were equally divided in to two groups. Group A, H. pylori negative (n=30) and group B, H. pylori positive (n=30) subjects. Table 1 shows the age distribution of the study participants. In group A the mean age of study subjects was 46.7±5.7 years. In group B the mean age of study subjects was 55.7±9.6 years. The other main finding of the study was that the H. pylori positive subjects were older than the negative subjects. There was statistically significant difference of age between group A and group B subjects shown in Table 1.

**Table 1:** Distribution of Subjects According to Age in Years n=60

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. Pylori -Ve</td>
<td>H. Pylori +Ve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46.7±5.7</td>
<td>55.7±9.6</td>
<td>16.51</td>
<td>0.03</td>
</tr>
</tbody>
</table>

The mean and standard deviation of lipid profile of study groups is shown in Table 2. The mean triglycerides of group A subjects was 177.5±77.25 while in group B the mean triglycerides were 232.01±65.53. Subjects with H. pylori positive have significantly higher triglyceride concentrations. In group A subjects the mean low-density lipoproteins were 110.3±21.6 while in group B was 126.94±49.8. Low density lipoprotein concentration was significantly lower in subjects with H. pylori negative groups. The mean high-density lipoprotein level in group A subjects was 43.4±10.11 while in group B the mean high-density lipoprotein level was 40.3±11.76. Subjects with H. pylori positive have insignificantly decreased high density lipoproteins concentrations compared with control group. The mean total cholesterol level in group A subjects was 165.35±31.40 while in group B total cholesterol level was 179.47±46.31. Subjects with H. pylori positive have significantly higher total cholesterol concentrations compared with control group subjects.

**Table 2:** Comparison of Lipid Profile Variation in H. Pylori -Ve And H. Pylori +Ve

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group A H. Pylori -Ve</th>
<th>Group B H. Pylori +Ve</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>177.5±77.25</td>
<td>232.01±65.53</td>
<td>0.01</td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>43.4±10.11</td>
<td>40.3±11.76</td>
<td>0.69</td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>110.3±21.6</td>
<td>126.94±49.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Total Cholesterol (mg/dl)</td>
<td>165.35±31.40</td>
<td>179.47±46.31</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**D I S C U S S I O N**

In this study we found that Helicobacter pylori positive subjects have higher levels of serum LDL,C, Triglycerides...
and total cholesterol. These results are supported by Kucukazman et al., who found total cholesterol and LDL concentrations increased in *H. pylori* positive patients than in negative *H. pylori* patients [10]. Similarly Sung et al., also reported the increased levels of TG, TC and LDL but decreased levels of HDL-C in *H. pylori* infected patients[11]. The results of present study showed that *H. pylori* is associated with low level of HDL-C. Hoffmesister et al., and Takashima et al., demonstrated that *H. pylori* causes low HDL-C levels[12, 13]. The results of present study consistent to the study done by Maleki et al., who found in his study that there is a relationship in *H. pylori* infection and cardiovascular diseases[14]. Higher occurrence of *H. pylori* was found among CAD patients. When related to *H. pylori* triglyceride levels were increased in positive than that in negative cases, on the other hand HDL-C levels were in positive cases. Shimamoto et al., estimated the association between *H. pylori* infection and the serum lipid profile revealed that *H. pylori* infection is positively associated with LDL-C, TC, and TG and negatively associated with HDL-C [15]. Findings of the current study showed similar results. Guzman et al., reported that gastric *H. pylori* infection does not have significant relation with the presence of dyslipidemia [16]. The alteration of the serum lipid profile was discreetly higher in the patients infected by *H. pylori* but they were not statistically significant. Hissun et al., reported that the serum of level of total cholesterol were significantly increased in group which had *H. pylori* positive and coronary artery disease, while in other group which had *H. pylori* positive without coronary heart disease the serum levels of LDL was significantly increased. These results are inconsistent with the present study[17]. Nam et al., estimated increased low-density lipoprotein (LDL) and decreased high-density lipoprotein (HDL) than *H. pylori*-negative group which was comparative to the present study[18]. Abdu et al., reported that serum LDL levels were high in *H. pylori* positive coronary artery disease patients as compared to the *H. pylori* negative patients which was similar to the present study findings [19]. The results of present study were consistent to the study of Longo-Mbenza et al., who found in his study that there is a relationship in *H. pylori* infection and cardiovascular diseases [20].

**Conclusions**

The present study results shown a relation between *H. pylori* infection and coronary artery risk factors. *H. pylori* infection affects the development of cardiovascular disease as it introduces the chronic long-term infection in epithelium, which leads to locally and systematically inflammation. *H. pylori* infection enhances the risk of cardiovascular disease by decreasing the level of HDL concentration and it may be understood as a risk factor of developing atherosclerosis.

**Authors Contribution**

Conceptualization: MM, NA, WA  
Methodology: GO, MM, MM  
Formal analysis: GO, MM, MM  
Writing-review and editing: MM, NA, WA  

All authors have read and agreed to the published version of the manuscript.

**Conflicts of Interest**

The authors declare no conflict of interest.

**Source of Funding**

The authors received no financial support for the research, authorship and/or publication of this article.

**References**


