Role of Adiponectin in Endoscopic Gastritis

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Endoscopic gastritis is a term used when there is an inflammatory change in the gastric mucosa like color and/or structure that was noticed by endoscope. To assess the effect of these factors and association of adiponectin with these factors. This is a case-controlled study. The study consists from 100 subjects. Eighty of them had gastritis by endoscopy and Forty of them were H. pylori positive and the rest were H. pylori negative. The rest twenty persons were healthy control group. Demographic information's were taken like age, sex and others by questionnaire. Endoscopy and lipid profile were done for them. Adiponectin was significantly lower (P=0.001) in gastritis patients whether infected (8.783±0.968) with H pylori or not (8.278 ±0.838) when compared with control group (9.119±0.1593) (Table-1-). Regarding lipid profile, there was a significant in all parameters of lipid profile in gastritis patients than healthy group (Table-1-). Analysis of correlation between adiponectin and BMI and weight demonstrated a negative correlation with gastritis with h pylori infection (r= -0.068 and r=0.356 respectively). This study shows that adiponectin had an important role in gastritis especially when there is an h pylori infection. Its level had a negative correlation with BMI and lipid profile.

Keywords: Adiponectin, gastritis, h pylori.
is an important factor in gastritis and its prevalence was decreased in Western countries and in some Asian countries like Japan\textsuperscript{13}. It found that treatment and eradication of these bacteria leads to increased circulating adiponectin levels in Japanese patients and could be helpful for preventing gastritis and its progression to other diseases\textsuperscript{14}.

Consequently, there are several important factors that related with endoscopic gastritis like BMI, \textit{Helicobacter pylori}, lipid profile and adiponectin. This study assesses the effect of these factors and association of adiponectin with these factors.

**Patients and methods**

This is a case-controlled study done by Al-Kindy College of Medicine from January 2017 to June 2018. The approval of medicinal morals board was obtained for contributors in this study. The proposal was accepted by the Al-Kindy College of Medicine and Al-Kindy Teaching Hospital. The knowledgeable permission was obtained from all of them. The Scientific and Ethical Committee of Al-Kindy medical college and Al-Kindy Teaching Hospital had approved and registered the study. Written informed consents were obtained from the patients and control normal blood donors.

The inclusion criteria were patients complaining from dyspepsia, upper abdominal pain, acid regurgitation, heartburn. The exclusion criteria were patients who had history of gastric surgery, peptic ulcer, gastric cancer, previous \textit{H. pylori} eradication, esophageal avarices and patients who were on medications like antacids, H2 blockers, proton pump inhibitors and non-steroidal anti-inflammatory drugs.

Data were collected from 100 subjects. Eighty of them had gastritis by endoscopy. Forty of them were \textit{H. pylori} positive and the rest were \textit{H. pylori} negative. The rest twenty persons were healthy control group. Demographic information’s were taken like age, sex and others by questionnaire.

**Endoscopy**

All patients examined for upper gastrointestinal endoscopic using gastroscope: GIF-H260; Olympus, Tokyo, Japan and Display screen; Olympus OEV-261H liquid crystal display monitor; Olympus, Tokyo, Japan. Endoscopic examinations performed by well-trained gastroenterologists. The presence or absence of endoscopic gastritis was determined by endoscopist according to their criteria\textsuperscript{15}.

**Anthropometric Measurements**

All measurement like weight, height, waist circumference, body mass index was calculated as weight in kilograms divided by the square of height in meters (16):

1. Normal Weight group: BMI 18.5 - 24.9 kg/m\textsuperscript{2}.
2. Over Weight group: BMIs 25.0 - 29.9 kg/m\textsuperscript{2}.
3. Obese group : BMIs \geq 30 kg/m\textsuperscript{2}.

Waist circumference was measured in centimeters (cm)\textsuperscript{17}.

**Biochemical analysis**

Five ml of venous blood were obtained from all subjects. Serum was analysis for lipid profile (cholesterol, triglyceride, HDLP, LDLP (Human-Germany), adiponectin (Human-Germany), and \textit{H pylori} (Eco test-Chain).

**Statistical analysis**

was done using MiniTab version 3.0 software. Data analysis was done using chi-square test for frequencies, while ANOVA test for means and standard deviation. Correlation coefficient used to assess the correlation between different parameters by Pearson correlation. P-value less than 0.05 were considered statistically significant.

**RESULTS AND DISCUSSION**

The total numbers of study groups were one hundred subjects; forty of them were gastritis with \textit{H pylori} infection and the other group was gastritis alone without \textit{H pylori} infection and the rest were twenty control healthy subjects. There was no significant differences among their ages and gender (P=0.134 and P=0.334 respectively)(Table-1). There was a significant increase in BMI(P=0.000), weight(P=0.000), waist circumference (P=0.018) in patients with gastritis with or without \textit{H pylori} when compared with control group(Table-1).

In this study, adiponectin was significantly lower ( P=0.001) in gastritis patients whether infected (8.783±0.968) with \textit{H pylori} or not (8.278 ±0.838) when compared with control group (9.119±0.1593) (Table-1). Regarding lipid profile, there was a significant in all parameters of lipid profile in gastritis patients than healthy group (Table-1). Analysis of correlation between adiponectin and BMI and weight demonstrated a negative correlation with gastritis with \textit{H pylori}.
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Table 1. Demographic differences of various parameters among patients with gastritis with and without H pylori infection and control group

| P- value | Control Group | Gastritis patients with H pylori -ve | Gastritis patients with H pylori +ve | Parameters |
|----------|---------------|--------------------------------------|--------------------------------------|------------|
|          | No.=20X±SD    | NO.=40X±SD                           | NO.=40X±SD                           |            |
| 0.134    | 37.30±12.43 (25-68) | 46.25±21.07(14-83)                  | 40.70±14.95 (12-68)                  | Age (year) |
| 0.334    | 14(70%)       | 20(50%)                              | 22(55%)                              | Male %     |
| 0.024    | 06(30%)       | 20(50%)                              | 18(45%)                              | Female %   |
| 0.000    | 73.72±2.54    | 78.39±3.42                           | 82.23±3.79                           | Weight (Kg) |
| 0.000    | 24.40±0.777   | 27.30±1.05                           | 27.13±0.853                          | BMIKg/m²   |
| 0.018    | 93.45±13.30   | 95.80±15.41                          | 103.90±16.14                         | Waist circumferene Cm |
| 0.994    | 1.03±2.15     | 1.09±3.46                            | 1.11±2.36                            | Waist to Hip Ratio |
| 0.001    | 9.11±0.1593   | 8.27±0.883                           | 8.78±0.968                           | Adiponectinng/ml |
| 0.000    | 2007±35.9     | 253.6±16.6                           | 285.3±14.8                           | Cholesterol Mg/dl |
| 0.000    | 160.0±30.2    | 290.0±36.4                           | 174.5±17.9                           | TriglycerideMg/dl |
| 0.000    | 40.92±1.20    | 48.60±3.39                           | 52.48±3.41                           | HDLMg/dl |
| 0.001    | 162.4±27.7    | 175.1±15.7                           | 179.2±13.4                           | LDLmg/dl |
| 0.000    | 3.54±0.0385   | 4.33±0.0734                          | 6.70±0.197                           | LDL/HDL |

It has been reported that obesity and increased BMI are related to gastrointestinal symptoms and endoscopic gastritis. Adiponectin is an anti-inflammatory and its serum concentrations are reduced in obesity with increased visceral fat accumulation. In this study, gastritis developed when there is increase in BMI especially with H pylori infection. This is associated with decreased adiponectin serum level. This is in agreement with other results that showed adiponectin promotes

Table 2. Pearson correlation analysis of adiponectin with different parameters in GERD patients

| P- value | Gastritis patients with H pylori -ve | P- value | Gastritis patients with H pylori +ve | Parameters |
|----------|--------------------------------------|----------|--------------------------------------|------------|
|          | NO.=40r                               | NO.=40r  |                                      |            |
| 0.266    | -0.180                                | 0.266    | -0.180                               | Age (year) |
| 0.527    | 0.103                                 | 0.000    | -0.601                               | Height (Cm) |
| 0.007    | -0.418                                | 0.024    | -0.356                               | Weight (Kg) |
| 0.184    | 0.214                                 | 0.677    | -0.068                               | BMIKg/m²   |
| 0.001    | -0.506                                | 0.429    | -0.129                               | Waist (Cm) |
| 0.103    | -0.026                                | 0.927    | 0.015                                | Hip Waist Ratio |
| 0.013    | -0.391                                | 0.791    | -0.043                               | Cholesterol Mg/dl |
| 0.337    | -0.156                                | 0.030    | -0.344                               | TriglycerideMg/dl |
| 0.809    | 0.040                                 | 0.001    | 0.487                                | HDLMg/dl |
| 0.047    | -0.315                                | 0.735    | -0.055                               | LDLmg/dl |
| 0.184    | 0.214                                 | 0.308    | 0.165                                | LDL/HDL |
ulcer healing, decrease ulcer area, reduce edema and leukocytes infiltration in submucosal layer\textsuperscript{18,19}. It is well known that adiponectin is associated with better inflammation reduction and healing\textsuperscript{20}. The gastric protective effect of adiponectin might be due to reduction of neutrophil infiltration, decrease in gastric motility and relaxation of circular muscles, flattening of the folds and reduce the volume of the gastric irritants on the rugal crest\textsuperscript{21,22}. In addition to that, adiponectin activates AMP-activated protein kinase (AMPK) system that regulates growth arrest and apoptosis by stimulating p53 and p21 and decreases production of reactive oxygen species (ROS) which may result in decreased activation of mitogen-activated-protein-kinase (MAPK)\textsuperscript{23,24,25}. So increase level of adiponectin reduce the risk of development of many diseases\textsuperscript{26}. There is a negative correlation with body mass index and adiponectin in gastritis with \textit{H pylori} and in general there is in agreement with other studies that demonstrated plasma adiponectin concentrations are inversely related to BMI, weight and waist circumference\textsuperscript{27}. The possible mechanism is that during adipogenesis, a feedback inhibition in its production may occur due to increase in the production of other adipocytokines like TNF-\textgreek{z} that decrease adipocyte expression and secretion of adiponectin\textsuperscript{28}. In addition to that infection with \textit{H pylori} leads to decrease in adiponectin serum level which in agreement with other studies \textsuperscript{12,29}. This study demonstrated a negative correlation between adiponectin with Cholesterol, triglyceride and LDL. Adiponectin has been shown to regulate weight reduction as well as free fatty acid oxidation. The mechanism underlying this is regulation of production proteins associated with triglyceride metabolism including acyl CoA oxidase, activated protein kinase, and peroxisome proliferator-activated receptor 3 (PPAR\textgreek{r}) which is in agreement with other studies\textsuperscript{30}.

**CONCLUSIONS**

This study shows that adiponectin had an important role in gastritis especially when there is an \textit{H pylori} infection. Its level had a negative correlation with BMI and lipid profile.

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