



Original Article

Role of adiponectin in patients with inflammatory bowel disease unclassified

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ABSTRACT

Background: Inflammatory bowel disease (IBD) is a lifestyle idiopathic, chronic, and inflammatory intestinal disorders that required long-term medications and care.

Aim of the study: Assess the level of adiponectin in IBDU and its relation with different parameters like lipid profile and Body Mass Index (BMI).

Type of the study: A case-controlled study.

Patients and methods: The total number of study groups was sixty individuals, forty of them were patients with inflammatory bowel disease unclassified and the rest were control healthy subjects. Serums were examined for lipid profile (cholesterol, triglyceride, HDLP, LDLP (Human-Germany), adiponectin (Human-Germany).

Results: Adiponectin, cholesterol, triglyceride, LDL and LDL/HDL were significantly higher in patient group. The results showed that there was a negative correlation between adiponectin and height ($r = -0.071$), waist to hip ratio ($r = -0.174$), cholesterol ($r = -0.417$), HDL ($r = -0.039$), LDL ($r = -0.451$) while other parameters there are positive correlation.

Conclusions: IBDU is associated with increased level of adiponectin which is positively associated with BMI and triglyceride. It is negatively correlation with height, waist to hip ratio, cholesterol, HDL and LDL.

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Papel da adiponectina em pacientes com doença intestinal inflamatória não classificada

RESUMO

Fundamento: A doença intestinal inflamatória é um distúrbio intestinal idiopático, crônico e inflamatório devido ao estilo de vida que requer medicamentos de longo prazo e cuidados.

Objetivo do estudo: Avaliar o nível de adiponectina na doença intestinal inflamatória não classificada e sua relação com diferentes parâmetros, como o perfil lipídico e o índice de massa corporal.

Palavras-chave:

Adiponectina

Colite

IMC

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Tipo de estudo: Estudo de caso controle.

Pacientes e métodos: O número total de grupos de estudos foi de 60 indivíduos, quarenta deles eram pacientes com doença intestinal inflamatória não classificada e o restante era de indivíduos saudáveis controle. Os soros foram examinados para detecção de perfil lipídico (colesterol, triglicerídeos, HDLP, LDLP (Humano-Alemanha), adiponectina (Humano-Alemanha).

Resultados: Adiponectina, colesterol, triglicerídeos, LDL e LDL/HDL foram significativamente maiores no grupo de pacientes. Os resultados mostraram que havia uma correlação negativa entre adiponectina e altura ($r = -0.071$), relação cintura-quadril ($r = -0.174$), colesterol ($r = -0.417$), HDL ($r = -0.039$), LDL ($r = -0.451$) enquanto que para outros parâmetros há uma correlação positiva.

Conclusões: Doença intestinal inflamatória não classificada apresenta um nível aumentado de adiponectina que está positivamente associado a índice de massa corporal e triglicerídeos. Está negativamente correlacionada com altura, relação cintura-quadril, colesterol, HDL e LDL.

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Introduction

Inflammatory bowel disease (IBD) is a lifestyle idiopathic, chronic, and inflammatory intestinal disorders that required long-term medications and care.¹ It encompasses two main types; ulcerative colitis (UC) and Crohn's disease (CD), sometimes the distinguishing between them is difficult. This includes lack of endoscopic and histological correlation with UC or CD which is difficult for decision making (physician) to make diagnosis. Thus, the terms indeterminate colitis (IC) and colonic inflammatory bowel disease unclassified (IBDU) were used and accounts about 5.7% of initial diagnoses of IBD.² It is used for patients who had no clear clinical, endoscopic, histological, or other features that aids in a diagnosis of either UC or CD so IBDU could be used.³ It is caused by interaction between genetic and environmental factors that alter the immune response of the intestine leading to cell damage.⁴ One of the immunomodulatory anti-inflammatory cytokines that produced by adipose tissue is Adiponectin which is present in the human blood which plays an important role in suppressing colitis.^{5,6} It had been found that patients with IBD had hypertrophied mesenteric adipose tissue that is capable of secreting high levels of adiponectin and its level inversely correlated with disease severity.^{7,8} Increased level of adiponectin had a protective role against colitis due to anti-inflammatory effect on mucosal intestinal epithelial cells.⁹ This due to reducing colon tissue-secreted pro-inflammatory cytokines, modulating goblet and epithelial cell expressions of the intestine, and increasing the levels of secretory mucin MUC2.¹⁰ On the other hand, adiponectin stimulate chemotaxis of immune cell of the innate immune defense mechanism and alteration in its level is associated with impaired immune response which is an important regulatory factor in the pathogenesis of intestinal inflammation that are partly related with gender.¹¹ Consequently, increased level of adiponectin prevents development of many diseases.¹²

This study aimed to assess the level of adiponectin in IBDU and its relation with different parameters like lipid profile and Body Mass Index (BMI).

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 this study and the proposal was obtained and accepted by the Al-Kindy College of Medicine and Al-Kindy Teaching Hospital.

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 group.

The inclusion criteria were patients complaining from overlapping features of ulcerative colitis (UC) and Crohn's disease (CD) regarded as inconsistent with either diagnosis and confirmed by pathologists, endoscopists, and clinicians as inflammatory bowel disease unclassified.¹³ Colonoscopy, upper gastrointestinal endoscopy, biopsies, serological tests, radiography, and other scanning procedures used for confirming diagnosis. The exclusion criteria were patients with proved UC and CD.

Data were collected from 60 subjects. Forty of them had inflammatory bowel disease unclassified. The rest twenty persons were healthy control group. Demographic information's were taken like age, sex and others by questionnaire.

Colonic endoscopy

All patients examined for lower 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.

Table 1 – Demographic differences of various parameters between patients with inflammatory bowel disease unclassified and control group.

Parameters	Patients with inflammatory bowel disease unclassified (n=40) X ± SEM	Control group (n=20) X ± SEM	p-Value
Age (year) range	51.95 ± 2.50 (23–78)	41.00 ± 2.50 (20–62)	0.003
Male%	22 (55%)	14 (70%)	0.028
Female%	18 (45%)	06 (30%)	
Height (cm)	1.6960 ± 0.0138	1.6835 ± 0.0192	0.601
Weight (kg)	82.93 ± 2.51	84.80 ± 3.98	0.692
BMI (kg/m ²)	28.718 ± 0.674	23.976 ± 0.550	0.000
Waist circumference (cm)	100.55 ± 1.87	99.85 ± 3.07	0.847
Waist to hip ratio	1.589 ± 38.3	1.080 ± 2.37	0.193
Adiponectin (µg/ml)	9.858 ± 3.82	7.866 ± 8.75	0.047
Cholesterol (mg/dl)	340.7 ± 23.2	197.8 ± 15	0.000
Triglyceride (mg/dl)	311.5 ± 33.1	149.75 ± 9.77	0.000
HDL (mg/dl)	41.05 ± 1.86	46.04 ± 3.97	0.265
LDL (mg/dl)	237.3 ± 23.4	129.6 ± 13.8	0.000
LDL/HDL	3.2145 ± 0.0612	2.2070 ± 0.0764	0.000

Anthropometric measurements

All measurement like weight in kilograms (kg), height in meters (M), waist circumference in centimeters (cm), body mass index was calculated as weight in kilograms divided by the square of height in meters ¹⁴:

Normal weight group: BMI 18.5–24.9 kg/m².

Over weight group: BMIs 25.0–29.9 kg/m².

Obese group: BMIs ≥ 30 kg/m².

Biochemical analysis

Five ml of venous blood were obtained from all participants. Serums were examined for lipid profile (cholesterol, triglyceride, HDLP, LDLP (Human-Germany), adiponectin (Human-Germany).

Statistical analysis

It was done using MiniTab version 3.0 software. Data analysis was done using chi-square test for frequencies, while student t-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

The total number of study groups was sixty individuals, forty of them were patients with inflammatory bowel disease unclassified and the rest were control healthy subjects. The patients group age was 51.95 ± 2.50 (23–78) which is significantly difference with control group 41.00 ± 2.50 (20–62) (P=0.003). Males 22 (55%) were more than females 18 (45%) in patients group which is significant difference from control group (P=0.028). Regarding height, weight, waist circumference and waist to hip ratio there were no significant differences between them. BMI of the patients is significantly higher in patients group (P=0.000) than the control. In this study, adiponectin, cholesterol, triglyceride, LDL and LDL/HDL were significantly higher in patient group (Table 1).

Table 2 – Pearson correlation analysis of adiponectin with different parameters in patients with inflammatory bowel disease unclassified.

Parameters	Patients with inflammatory bowel disease unclassified (n=40)	p-Value
Age (year)	0.140	0.390
Height (cm)	−0.071	0.665
Weight (kg)	0.300	0.060
BMI (kg/m ²)	0.433	0.005
Waist (cm)	0.404	0.010
Waist to hip ratio	−0.174	0.283
Cholesterol (mg/dl)	−0.417	0.007
Triglyceride (mg/dl)	0.140	0.390
HDL (mg/dl)	−0.039	0.810
LDL (mg/dl)	−0.451	0.003
LDL/HDL	0.272	0.089

The results showed that there was a negative correlation between adiponectin and height (r = −0.071), waist to hip ratio (r = −0.174), cholesterol (r = −0.417), HDL (r = −0.039), LDL (r = −0.451) while other parameters there are positive correlation as showed in Table 2.

Discussion

The debates and arguments around the term IBDU have been never ending.¹⁵ It had been found that 13% of patients will remain unclassified after one year follow-up and 5% remain unclassified over long time.¹⁶ This study try to shed a light about pathogenesis regarding adiponectin and its relation in regulation of the immune system as anti inflammatory cytokine secreted from visceral adipose tissue. Adiponectine was significantly higher in patients' with IBDU. Thus high level of adiponectin had a protective effect against further inflammation which is in agreement with other study that showed adiponectin maintains intestinal homeostasis and protects against colitis through interactions with its receptor AdipoR1 and by modulating adaptive immunity and restrict B cell immune response.¹⁷ This can be achieved by binding lipopolysaccharides which confers a resistance on it for bac-

terial antigens¹⁸ and interaction with mucin proteins in the colon.¹⁹ The pathogenesis of this disease is multifactorial, including both genes and environment and their interactions with each other.²⁰ Other factor that affects adiponectin level is obesity and BMI which is inversely related with BMI.²¹ There is also significant increase in the level of cholesterol, triglyceride, LDL and BMI in patients group. This study demonstrated a negative correlation between adiponectin and height ($r = -0.071$), waist to hip ratio ($r = -0.174$), cholesterol ($r = -0.417$), HDL ($r = -0.039$), LDL ($r = -0.451$). Other study showed no association between inflammation of the bowel and obesity and BMI.²² Thus the role of the obesity remains to be clarified. Other study found that a higher visceral-to-subcutaneous fat ratio is associated morbidity whereas BMI is not affected.²³ Adipocytes as part of the innate immune system actively contribute in antimicrobial host defenses against intestinal bacterial translocation. Other study showed an association of adiponectin with BMI.²⁰ So modulators of adipose tissue function using adiponectin represents future potential drug targets in this disease as a modality of treatment of this disease.⁵

Conclusions

IBDU is associated with increased level of adiponectin which is positively associated with BMI and triglyceride. It is negatively correlation with height, waist to hip ratio, cholesterol, HDL and LDL.

Conflicts of interest

The authors declare no conflicts of interest.

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