

Visfatin level in patients with colorectal adenoma

Mohammad Sadegh Fazeli¹, Mohammad Reza Keramati^{*2}, Azam Rahimi³
Alireza Kazemeini⁴, Mohammad Mehdi Banoei⁵, Habibollah Dashti⁶, Amir Reza Fazeli⁷

Received: 12 July 2015

Accepted: 24 October 2015

Published: 24 January 2016

Abstract

Background: Visfatin is an adipocytokine secreted by visceral adipose tissue. It has been shown that adipocytokines may contribute to the induction of carcinogens and progression of tumors. Previously, we found a significant increase in the visfatin serum level in colorectal cancer patients. Herein, we investigated if this cytokine increases in patients with colorectal adenoma as a precursor of colorectal cancer.

Methods: In this case-control analytic study, a total of 34 patients diagnosed with colorectal adenoma and 35 disease-free controls were included. Adenomas were also categorized based on their location within the colon. Visfatin serum levels were measured in all cases and controls using enzyme-linked immunosorbent assay kits. In order to compare visfatin levels between groups a two-tailed t-test was considered. Pearson correlation was also used to assess the relationship between visfatin levels and other measured variables.

Results: Patients included 18 male (53%) and 16 female (47%) with a mean±SD age of 48.3±10.96 years and controls were 18 male (51%) and 17 female (49%) with a mean±SD age of 51.6±12.52 years. There were no significant difference in terms of the visfatin level between the two groups (6.7±3.01 ng/ml for patients and 6.8±2.49 ng/ml for controls, $p>0.05$). Except for a significant correlation between the BMI and visfatin level ($p=0.041$), no other correlation was detected. We found no significant difference between the levels of visfatin in each location of adenoma comparing the healthy controls ($p>0.05$ in all comparisons). There was no statistical difference between the locations groups in terms of visfatin level as well ($p>0.05$).

Conclusion: Visfatin serum level does not significantly increase in patients with colorectal adenoma. Site of adenoma within the colon or rectum does not seem to play an important role in this regard as well.

Keywords: Colorectal adenoma, Visfatin, Adipocytokine, Colon, Rectum.

Cite this article as: Fazeli MS, Keramati MR, Rahimi A, Kazemeini A, Banoei MM, Dashti H, Fazeli AR. Visfatin level in patients with colorectal adenoma. *Med J Islam Repub Iran* 2016 (24 January). Vol. 30:320.

Introduction

Adipocytokines such as visfatin are cytokines secreted by visceral adipose tissues. Based on recent basic and clinical studies, it has been shown that adipocytokines may contribute to the induction of carcinogens and progression of tumors (1).

Visfatin was initially recognized as a

growth factor for proliferation of B-cell lymphocyte, called the pre-B cell colony-enhancing factor. Subsequently, it was found as a cytokine present in a variety of cells and tissues with metabolic and inflammatory effect. Visfatin have also been shown to correlate with pro-inflammatory cytokines such as IL-1, IL-6, and TNF α . It

¹. Associate Professor of Surgery, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. mhfazeli@yahoo.com

². (**Corresponding author**) Assistant Professor of Surgery, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. dr_morezak@yahoo.com

³. General Surgeon, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. azamrahimi7878@yahoo.com

⁴. Assistant Professor of Surgery, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. alikalazemeini@gmail.com

⁵. PhD Student, Department of Critical Care Medicine, University of Calgary, Calgary, Canada. mmbanoei@yahoo.com

⁶. Assistant Professor of Surgery, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. shad_3070@yahoo.com

⁷. Medical Student, Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran. mhfazeli@yahoo.com

stimulates IL-6 and IL-8 and may be associated with oxidative stress parameters. Modulation of insulin by binding to the insulin receptor is another recognized function for visfatin (2,3).

Previously, we reported the levels of various adipocytokines in patients with colorectal cancer and we found a significant increase in the visfatin serum level in colorectal cancer patients comparing to controls (4). Therefore, we examined if this cytokine increases in patients with colorectal adenoma as a precursor of colorectal cancer. To the best of our knowledge, in addition to a previous study done by Nakajima et al. (1), the present study is among the first reports to evaluate the visfatin level in patients with colorectal adenoma comparing to healthy controls.

Methods

Data

This case-control study was conducted at the department of surgery of Imam Medical Complex affiliated to Tehran University of Medical Sciences. Between January 2014 and June 2015, a total of 34 patients diagnosed with colorectal adenoma and 35 disease-free controls were included in case and control groups, respectively. All the cases had undergone colonoscopy and diagnosed with colorectal adenoma. All final diagnoses were confirmed using histologic evaluation of the samples. Patients with a previous history of any colorectal disease including polyps, adenoma, irritable bowel disease or cancerous lesion were excluded from the study. History of familial adenomatous polyposis was another exclusion criterion. Disease-free controls were selected from participants in the Persian Gulf Healthy Heart Study (5). This study was carried out between March 2013 and March 2015 in Colorectal Surgery Department of Tehran University of Medical Sciences. It has been approved by the ethics committee of the university. All the patients were informed about the study and written informed consent was taken from each patient.

For each patient, systolic and diastolic blood pressures were taken twice after a 15-min rest in the sitting position. Body mass index (BMI) and waist-to-hip ratio (WHR) were calculated after measuring height, weight, waist circumference (mid-way level between the costal margins and the iliac crests) and hip circumference (at the level of the greater trochanters). In order to measure serum markers, fasting venous blood samples were obtained from all patients and the disease-free controls. Serum biochemical parameters including blood glucose, triglyceride, and cholesterol levels were measured on the day of sampling using Selectra 2 autoanalyzer (Vital Scientific, Spankeren, Netherlands). Glucose was assayed using enzymatic colorimetric method (Pars Azmun Inc., Tehran, Iran). Serum cholesterol (HDL and total) and triglyceride levels were measured using cholesterol oxidase/phenol aminoantipyrine and glycerol-3-phosphate oxidase phenol aminoantipyrine enzymatic methods, respectively. In cases with triglycerides' level of less than 400 mg/dl, serum LDL was calculated using the Friedewald formula. Enzyme-linked immunosorbent assay kits (AdipoGen, Seoul, Korea) were utilized in order to measure visfatin levels. The assay sensitivity for visfatin was 0.10 ng/ml; the intra- and inter-assay coefficients of variance were 3.8–5.5% and 6.4–9.5%, respectively.

Statistical analysis

All statistical analyses were performed using the SPSS v. 20. All data were initially analyzed using the Kolmogorov–Smirnov test to assess normality. Descriptive values were expressed as the mean \pm SD. In order to compare visfatin levels between groups a two-tailed t-test was considered. Pearson's correlation was also used to assess the relationship between visfatin levels and other measured variables. P-values of less than 0.05 were considered significant.

Results

In this study a total of 69 cases including 34 patients with colorectal adenoma and 35

disease-free controls were enrolled. Patients included 18 males (53%) and 16 females (47%) and controls were 18 male (51%) and 17 female (49%). Patients and controls were also matched regarding their age as well. Demographic information of both groups and other studied variables including systolic and diastolic blood pressures, body mass index (BMI), waist to hip ratio and lipid profile of patients have been summarized in Table 1. As can be seen in Table 1, there was no significant statistical difference among the patients and the controls in terms of these variables ($p>0.05$ in all comparisons).

Visfatin level was also measured in all cases. Mean \pm SD of visfatin levels in male and female patients were 6.3 ± 3.01 ng/ml and 7.1 ± 3.05 ng/ml, respectively. The visfatin level in the control group was 7.2 ± 2.41 ng/ml and 6.4 ± 2.59 ng/ml for males and females, respectively. Moreover, there was no significant difference in terms of the visfatin level between both gender in each group ($p=0.482$ for patients and

$p=0.375$ for controls). We also tried to analyze any possible correlation between the visfatin levels and each of the mentioned studied variables. Except for a significant correlation between the BMI value and visfatin level ($p=0.041$), no other correlation was detected (Table 1).

Location of adenomas was also considered. Visfatin levels were analyzed separately based on the location of the adenoma within the large intestine in the patient group (Table 2). We found no significant difference between the levels of visfatin in each location comparing the healthy controls ($p>0.05$ in all comparisons). There was no statistical difference between the locations groups in terms of visfatin level as well ($p=0.068$).

Discussion

Visfatin can be found in significant amounts in adipose tissue and it is produced primarily by visceral adipose tissue. Therefore, visfatin serum levels may be affected by a change in body weight and

Table 1. Correlation between visfatin level and other variables

Variable	Controls (Mean \pm SD)	Patients (Mean \pm SD)	Difference between Controls and patients (p)**	Correlation with Visfatin in Controls (p)**	Correlation with Visfatin in Patients (p)**
Age (years)	51.60 \pm 12.52	48.32 \pm 10.96	0.252	0.650	0.360
SBP (mmHg)	109.85 \pm 8.90	112.20 \pm 9.47	0.267	0.278	0.970
DBP (mmHg)	68.85 \pm 7.58	71.61 \pm 7.85	0.142	0.730	0.938
Body Mass Index	26.22 \pm 1.31	26.14 \pm 1.29	0.796	0.122	0.041
Waist to Hip Ratio	0.85 \pm 0.06	0.86 \pm 0.05	0.806	0.747	0.146
FBS (mg/dl)	79.94 \pm 12.89	81.00 \pm 12.38	0.730	0.854	0.274
TG (mg/dl)	146.60 \pm 44.87	139.00 \pm 45.59	0.488	0.807	0.528
HDL (mg/dl)	40.91 \pm 10.72	44.70 \pm 12.01	0.171	0.326	0.471
LDL (mg/dl)	87.54 \pm 11.22	83.24 \pm 16.36	0.212	0.573	0.182
Cholesterol	156.20 \pm 31.97	161.08 \pm 28.25	0.504	0.826	0.724

* $p<0.05$ were considered significant.

** Two-tailed t-test was used to compare visfatin levels between groups. Pearson's correlation was used to evaluate the relationship between visfatin levels and other measured variables.

Table 2. Descriptive statistics of Level of Visfatin in various locations of adenoma

Visfatin level	Location of adenoma	Mean \pm SD (ng/ml)	Range: Min-Max (ng/ml)	p*
Patients	Ascending colon (N=6)	3.9 \pm 3.25	0.85-8.14	0.083
	Transverse colon (N=2)	8.5 \pm 1.34	7.60-9.50	0.281
	Descending colon (N=0)	-	-	-
	Sigmoid colon (N=13)	7.5 \pm 2.83	1.07-11.50	0.418
	Rectum (N=13)	6.8 \pm 2.68	2.70-12.00	0.987
	Total (N=34)	6.7 \pm 3.01	0.85-12.00	0.846
Controls	-	6.8 \pm 2.49	1.92-10.90	-

* Values show possible differences between visfatin levels of patients suffering from adenoma in each part of colon or rectum comparing to the control levels.

relationship between obesity, BMI and serum levels of visfatin has also been documented (2,6). Although the visfatin level had a significant relation with the BMI value in our adenoma patients, we found no statistical significant relation in the healthy controls.

Metabolic syndrome is a group of harmful metabolic abnormalities, including visceral obesity, hyperglycemia, dyslipidemia, and hypertension. Increased circulating visfatin levels have also been found in patients with metabolic syndrome (7,8). Therefore, we tried to depict any relation between visfatin level and metabolic abnormalities involved in metabolic syndrome in patients with colorectal adenoma. Although we found a significant relation between the visfatin level and BMI of patients, we did not detect any relation for hyperglycemia, hypertension (systolic and diastolic) and dyslipidemia (hypercholesterolemia or hypertriglyceridemia).

We tried to categorize our patients according to the location of their adenoma. Sigmoid (13 patients, 38.2%) and rectum (13 patients, 38.2%) were the most common site followed by ascending colon (6 patients, 17.6%). Ascending (3.92 ± 3.25 ng/ml) and transverse colon (8.55 ± 1.34 ng/ml) had the lowest and highest mean serum levels of visfatin, respectively. Sigmoid colon showed the highest maximum level. Nevertheless, our analysis revealed no significant difference between these levels and the value for the visfatin level in normal controls. Nakajima et al. (1) analyzed the possible relations between the size and number of colorectal adenomas and some adipocytokines including the visfatin. They found that except for adiponectin, other cytokines including the visfatin has no relation with these two factors. Consequently, according to this study and our findings, it seems that size, number and location of colorectal adenoma are not influential factors affects the adipocytokine levels.

Low number of cases was the major limitation in our study. Designing another study

with higher number of patients is recommended for future studies.

Conclusion

Although visfatin level has been shown to be increased in serums of patients with colorectal cancer, it does not significantly increase in cases with colorectal adenoma. Site of adenoma within the colon or rectum does not seem to play an important role in this regard as well.

Conflict of Interests

All authors have no conflict of interest.

References

1. Nakajima TE, Yamada Y, Hamano T, Furuta K, Matsuda T, Fujita S, et al. Adipocytokines as new promising markers of colorectal tumors: adiponectin for colorectal adenoma, and resistin and visfatin for colorectal cancer. *Cancer Science* 2010; 101(5):1286-91.
2. Teplan Jr V, Senolt L, Hulejova H, Teplan V, Stollova M, Gurlich R. Early changes in serum visfatin after abdominal surgery: a new pro-inflammatory marker in diagnosis? *Biomedical papers of the Medical Faculty of the University Palacky, Olomouc, Czechoslovakia*. 2014.
3. Pilz S, Mangge H, Obermayer-Pietsch B, Marz W. Visfatin/pre-B-cell colony-enhancing factor: a protein with various suggested functions. *Investigation Endocrinol Invest* 2007;30(2):138-44.
4. Fazeli MS, Dashti H, Akbarzadeh S, Assadi M, Aminian A, Keramati MR, et al. Circulating levels of novel adipocytokines in patients with colorectal cancer. *Cytokine* 2013;62(1):81-5.
5. Nabipour I, Amiri M, Imami SR, Jahfari SM, Shafeiae E, Nosrati A, et al. The metabolic syndrome and nonfatal ischemic heart disease; a population-based study. *Int J Cardiol* 2007;118(1):48-53.
6. Sethi JK, Vidal-Puig A. Visfatin: the missing link between intra-abdominal obesity and diabetes? *Trends Mol Med* 2005;11(8):344-7.
7. Kolsgaard ML, Wangensteen T, Brunborg C, Joner G, Holven KB, Halvorsen B, et al. Elevated visfatin levels in overweight and obese children and adolescents with metabolic syndrome. *Scand J Clin Lab Invest* 2009;69(8):858-64.
8. Kowalska I, Straczkowski M, Nikolajuk A, Adamska A, Karczewska-Kupczewska M, Otziomek E, et al. Insulin resistance, serum adiponectin, and pro-inflammatory markers in young subjects with the metabolic syndrome. *Metabolism* 2008;57(11):1539-44.