SELECTED SERUM ADIPOKINES IN CHILDREN WITH IRRITABLE BOWEL SYNDROME

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INTRODUCTION

Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder. The pathogenesis of this disease has not been clarified so far; genetic, psychosomatic, microbiological factors, as well as stress and diet may be involved. It is hypothesized that visceral hypersensitivity observed in IBS is associated with the activation of immune system and development of low-grade inflammation in the intestinal mucosa. Previous studies have shown that hormonal function of adipose tissue in inflammatory bowel disease is disturbed. However, there is only a few reports on serum adipokine concentrations in IBS.

OBJECTIVES

1) Assessment of serum concentrations of leptin, adiponectin, chemerin and omentin-1 in children with IBS and healthy
2) Evaluation of relationships between adipokines and anthropometric as well as metabolic parameters

METHODS

- 33 IBS patients (11 girls, 22 boys) - **IBS** and 30 healthy children (11 girls, 19 boys) –**C** aged 5-17 years.
- Anthropometric measurements (height, weight, BMI, waist circumference, hip circumference, WHR)
- Analysis of body composition using BIA (Akern, Italy)
- Biochemical tests (C-reactive protein, transaminase levels, fasting glucose, insulin, HOMA-IR, blood lipid profile)
- Leptin, adiponectin, chemerin, omentin-1 serum concentrations were determined using commercially available ELISA kits

RESULTS

Table I. Results of anthropometric measurements

Parameter	IBS (n=33)	C (n=30)
age [years]	13,6 ± 3,2 (5,7 - 17,8)	13,6 ± 3,4 (5,1 - 17,5)
height [cm]	163,2 ± 18,5 (119,5 - 185,0)	161,6 ± 19,7 (118,9 - 187,9)
weight [kg]	56,4 ± 21,4 (23,4 - 110,0)	52,6 ± 19,5 (20,2 - 90,9)
BMI [kg/m^2]	20,00 ± 4,69 (12,64 - 30,09)	19,36 ± 4,31 (14,29 - 30,87)
waist circ. [cm]	69,4 ± 12,4 (50,3 - 92,6)	67,1 ± 10,4 (51,2 - 93,2)
WHR	0,82 ± 0,05 (0,74 - 0,94)	0,80 ± 0,05 (0,68 - 0,91)
FM [kg]	14,1 ± 10,0 (7,0 - 36,2)	11,8 ± 7,1 (4,0 - 30,2)
FM [%]	24,0 ± 10,9 (10,2 - 46,1)	22,1 ± 7,4 (7,2 - 35,0)

Table II. Results of biochemical and hormonal parameters assessments

Parameter	IBS (n=33)	C (n=30)
CRP [mg/l]	1,19 ± 1,28 (0,0 - 6,2)	0,94 ± 0,84 (0,0 - 3,6)
glucose [mg/dl]	89,6 ± 6,9 (77,0 - 104,0)	85,8 ± 8,0 (65,0 - 102,0)
insulin [µU/ml]	9,98 ± 5,99 (1,62 - 29,52)	7,92 ± 4,53 (1,13 - 20,97)
AlAT [U/L]	9,8 ± 5,0 (5,8 - 29,1)	10,2 ± 4,0 (4,3 - 22,9)
AspAT [U/L]	18,2 ± 4,59 (10,7 - 32,3)	19,8 ± 5,7 (11,8 - 36,0)
Total cholesterol [mmol/l]	3,92 ± 0,82 (2,67 - 6,16)	3,83 ± 0,58 (2,63 - 4,97)
HDL [mmol/l]	1,26 ± 0,31[a] (0,86 - 2,17)	1,49 ± 0,36 (0,92 - 2,29)
LDL [mmol/l]	2,18 ± 0,68 (1,11 - 4,27)	2,02 ± 0,45 (1,06 - 2,83)
triglycerides [mmol/l]	1,05 ± 0,49[b] (0,37 - 2,81)	0,68 ± 0,32 (0,42 - 1,94)
HOMA - IR	2,21 ± 1,5[b] (0,36 - 7,14)	1,57 ± 0,81 (0,23 - 3,59)

[a] p = 0,009 IBS vs C
[b] p = 0,001 IBS vs C

Fig. 1 Serum leptin concentrations

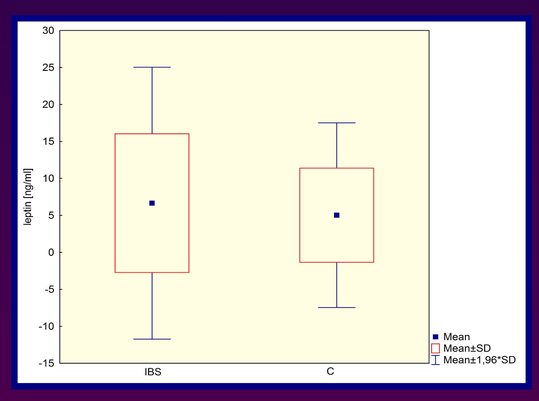

Fig. 2 Serum adiponectin concentrations

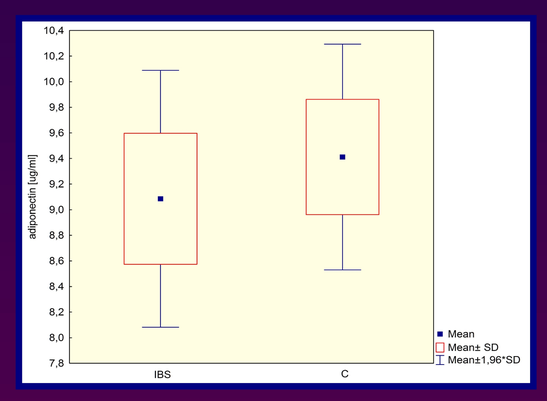

Fig. 3 Serum chemerin concentrations (p=0,03)

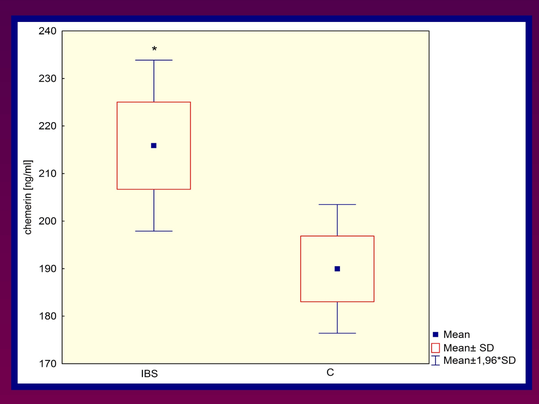

Fig. 4 Serum omentin-1 concentrations (p=0,04)

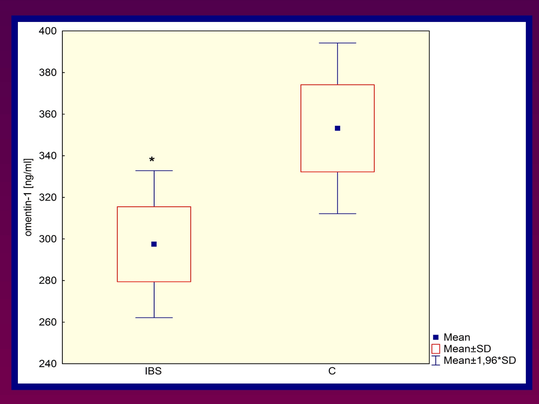

Fig. 5 ROC curve for **chemerin** concentrations; *sensitivity* 0,39 *specificity* 0,87 *efficiency* 0.76

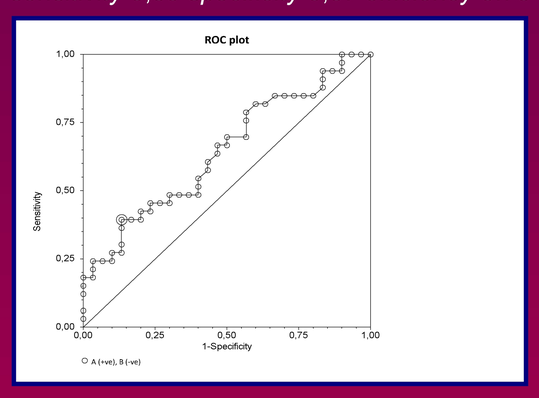

Fig. 6 ROC curve for **omentin-1** concentrations; *sensitivity* 0,60, *specificity* 0,80,*efficiency* 0,64

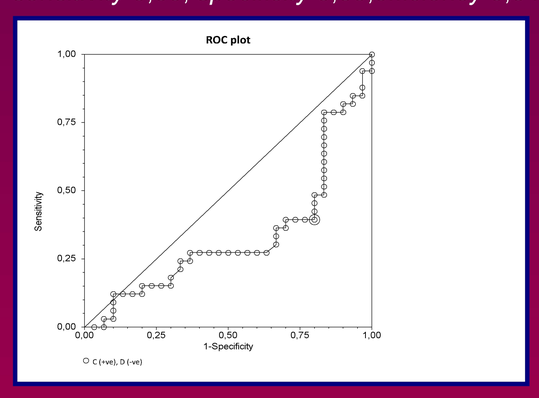

Table IV. Analysis of correlations between serum adipokines and anthropometric parameters

Parameter	leptin [ng/ml]		adiponectin [µg/ml]		chemerin [ng/ml]		omentin-1 [ng/ml]	
	IBS	C	IBS	C	IBS	C	IBS	C
age [years]	r=-0,07 p=0,70	r=0,27 p=0,15	r=-0,34 p=0,06	**r=-0,47 p=0,009**	r=0,11 p=0,58	r=-0,31 p=0,09	r=-0,22 p=0,24	r=0,14 p=0,46
height [cm]	r=-0,01 p=0,99	r=-0,04 p=0,84	**r=-0,49 p=0,03**	**r=-0,48 p=0,007**	r=0,09 p=0,63	**r=-0,52 p=0,004**	**r=-0,39 p=0,03**	r=0,10 p=0,59
weight [kg]	**r=0,44 p=0,01**	r=0,31 p=0,09	**r=-0,51 p=0,004**	**r=-0,58 p=0,001**	r=0,33 p=0,08	r=-0,34 p=0,06	**r=-0,49 p=0,006**	r=-0,14 p=0,47
BMI [kg/m2]	**r=0,57 p<0,001**	**r=0,44 p=0,01**	**r=-0,41 p=0,02**	**r=-0,49 p=0,006**	**r=0,47 p=0,01**	r=-0,10 p=0,59	**r=-0,52 p=0,003**	r=-0,31 p=0,10
waist circ. [cm]	**r=0,49 p<0,001**	**r=0,39 p=0,03**	**r=-0,52 p=0,003**	**r=-0,48 p=0,007**	r=0,36 p=0,05	r=-0,28 p=0,13	**r=-0,54 p=0,002**	r=-0,12 p=0,50
WHR	**r=0,33 p=0,004**	r=-0,06 p=0,76	r=-0,25 p=0,17	r=0,80 p=0,69	r=0,26 p=0,16	r=0,04 p=0,84	**r=-0,42 p=0,02**	r=-0,17 p=0,37

Table V. Analysis of correlations between serum adipokines and laboratory assays

Parameter	leptin [ng/ml]		adiponectin [µg/ml]		chemerin [ng/ml]		omentin-1 [ng/ml]	
	IBS	C	IBS	C	IBS	C	IBS	C
CRP [mg/l]	**r=0,44 p=0,01**	r=-0,06 p=0,77	r=-0,06 p=0,75	r=-0,07 p=0,71	r=0,31 p=0,08	r=0,33 p=0,08	**r=-0,36 p=0,04**	r=0,13 p=0,50
glucose [mg/dl]	r=0,29 p=0,12	r=-0,07 p=0,70	r=-0,15 p=0,44	r=0,05 p=0,80	r=0,10 p=0,62	r=-0,25 p=0,80	r=-0,30 p=0,11	r=-0,29 p=0,12
insulin [µU/ml]	**r=0,53 p=0,001**	**r=0,48 p=0,007**	r=-0,36 p=0,05	**r=-0,47 p=0,009**	**r=0,53 p=0,003**	r=-0,15 p=0,42	**r=-0,50 p=0,005**	r=-0,30 p=0,11
AlAT [U/L]	r=0,30 p=0,90	r=0,23 p=0,22	r=-0,15 p=0,42	r=-0,11 p=0,58	r=0,18 p=0,31	r=-0,34 p=0,07	r=-0,21 p=0,24	r=-0,34 p=0,07
AspAT [U/L]	r=-0,17 p=0,35	r=-0,31 p=0,09	r=-0,03 p=0,90	r=0,16 p=0,39	r=-0,04 p=0,82	r=-0,23 p=0,22	r=0,26 p=0,16	r=-0,09 p=0,65
Total cholesterol [mmol/l]	r=0,21 p=0,24	r=-0,03 p=0,89	**r=0,37 p=0,05**	r=0,29 p=0,12	**r=0,45 p=0,01**	r=-0,06 p=0,77	r=0,06 p=0,74	r=-0,16 p=0,40
HDL [mmol/l]	r=-0,19 p=0,28	r=0,01 p=0,99	r=0,19 p=0,31	**r=0,39 p=0,03**	r=-0,17 p=0,37	r=-0,10 p=0,60	**r=0,38 p=0,04**	r=-0,10 p=0,60
LDL [mmol/l]	r=0,26 p=0,14	r=-0,03 p=0,86	**r=0,36 p=0,05**	r=0,17 p=0,37	**r=0,49 p=0,006**	r=-0,01 p=0,98	r=0,03 p=0,88	r=-0,08 p=0,68
triglycerides [mmol/l]	**r=0,36 p=0,04**	r=0,18 p=0,34	r=0,03 p=0,86	r=-0,33 p=0,08	**r=0,41 p=0,02**	r=0,07 p=0,70	**r=-0,37 p=0,04**	r=-0,11 p=0,57
HOMA - IR	**r=0,61 p<0,001**	**r=0,39 p=0,04**	**r=-0,37 p=0,04**	**r=-0,44 p=0,01**	**r=0,50 p=0,004**	r=-0,23 p=0,21	**r=-0,49 p=0,006**	r=-0,26 p=0,21

CONCLUSIONS:

1) In children with IBS serum chemerin and omentin-1 concentrations show significant differences in comparison to healthy subjects.
2) The observed changes may result from development of low-grade inflammation.
3) Serum chemerin and omentin-1 concentrations can be used as IBS biomarkers of good specificity and moderate sensitivity.
4) In children with IBS serum concentrations of the examined adipokines are closely related to their nutritional status, and in the case of chemerin and omentin-1 also with insulin resistance.
5) Elevated serum chemerin levels and reduced omentin-1 concentrations may contribute to the development of lipid disorders in children with IBS.

DISCLOSURE STATEMENT

Speaker`s name: Joanna Oświęcimska

□ I have the following potential conflicts of interest to report:

□ Research Contracts □ Consulting □ Employment in the Industry □ Stockholder of a healthcare company □ Owner of a healthcare company □ Other(s)

x I declare that I have no potential conflict of interest.

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Fat, metabolism and obesity

Joanna Oswiecimska

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