Irisin Hormone level in Type 2 Diabetic Patients with and without Diabetic Neuropathy

Manal M. AbuShady[1], Mohammad Reda Halawa [1], Mohammad Abdel-Fattah Mahmoud [2], Mohammad Hasan Ibrahim [3]

[1]Division of Endocrinology, Department of Internal Medicine, Faculty of Medicine, Ain Shams University. [2] Internal Medicine department, Military Medical Academy, [3]Clinical pathology department, Military Medical Academy, Cairo, Egypt.

OBJECTIVES

Irisin is a novel myokine that promote energy expenditure (1). It could act on adipocyte metabolism through a novel neural pathway and on the other hand irisin induces neural proliferation and adequate neural differentiation (2). **Aim:** we aimed to assess serum irisin level in type 2 diabetics (T2DM) and correlate it with metabolic parameters. Also, we assessed the relation between irisin level and diabetic peripheral neuropathy (DPN).

METHODS

This is a case control study was conducted on 90 subjects, collected from outpatient clinic of endocrinology unit of Ain Shams University and Military Medical Academy. They were divided into three groups: **Group 1:** 30 type 2 diabetic patients without neuropathy. **Group 2:** 30 type 2 diabetic patients with peripheral neuropathy and **group 3:** 30 healthy control subjects. **DN4 questionnaire** (Douleur Neuropathique 4 questions) was used to screen for diabetic neuropathy, a 10-item diagnostic questionnaire that is developed by Bouhassira et al. (3). The total score is calculated as the sum of the 10 items and the cut-off value for the diagnosis of neuropathic pain is a total score of 4/10. Clinical examination included measurement of blood pressure, weight, height, BMI (kg/m2) and neurological examination.

Serum Irisin, FPG, 2hPG, HbA1c, TG, fasting insulin and HOMA-IR were measured.

Graphs and tables

Table 2: Correlation between Irisin and all studied parameters in different groups using Spearman's rank correlation coefficient (r):

Item	All Groups	All Diabetics	Group 1	Group 2	Group 3
Irisin (ng/ml)	80.66–27.31	40.92+17.9	54.27+15.24	27.57+7.61	160.14+58.67
Age (Years)	-0.137	-0.015	-0.099	-0.179	-0.480**
BMI (kg/m²)	0.189	0.093	0.030	0.151	0.300
Duration (years)	----	-0.764**	-0.442*	-0.580**	--
FPG (mg/dl)	-0.487**	-0.450**	-0.572**	-0.708**	-0.052
2h PG (mg/dl)	-0.570**	-0.428**	-0.556**	-0.730**	-0.149
HbA1c (%)	-0.596**	-0.605**	-0.819**	-0.850**	-0.136
F.Insulin (µU/mL)	-0.368**	-0.224	-0.451**	-0.346**	-0.007
HOMA IR	-0.441**	-0.197	-0.451*	-0.605**	-0.002
T.Chol. (mg/dl)	-0.261*	0.239	0.068	-0.072	-0.308
TGs (mg/dl)	-0.327**	-0.078	-0.369*	-0.271	-0.108

*; statistically significant, **; high statistical significant

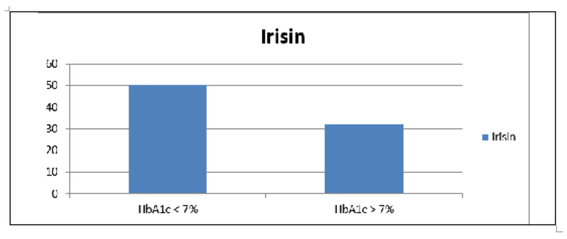

Figure 1: Irisin in patients with HbA1C less than and more than 7%

RESULTS

Irisin level was significantly lower in diabetics than control (40.92 17.99 vs.160.14 58.67 ng/mL, p<0.01). Diabetics with PN had lower irisin than diabetics without complications (27.57 7.61 vs.54.27 15.24 ng/mL, p<0.01). Irisin levels were negatively correlated with FBS (r =-0.487), 2hPG (r = -0.570), HbA1c (r = -0.596), fasting Insulin (r = -0.368), HOMA-IR (r = -0.441) and TGs (r = -0.327) in all studied groups (p<0.01). Also, it was negatively correlated with the duration of diabetes in all diabetics (-0.764, p<0.01).We found a negative correlation between irisin and age only in healthy subjects (-0.480, p<0.01). Multiple regression analysis revealed that HbA1C, age, F. Insulin, BMI, and HOMA-IR respectively were independent determinants for irisin level.

CONCLUSIONS

we found that irisin levels were decreased in type 2 diabetic patients and a further significant reduction was observed in patients with diabetic neuropathy. There is a significant negative correlation between irisin level and glycemic control and insulin resistance state.

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Manal Abushady

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