Glycemic control and oxidative stress markers and their relationship with the thioredoxin interacting protein (Txnip) gene in type 2 diabetic patients [Control Glicémico Y Marcadores De Estrés Oxidativo Y Su Relación Con El Gen De La Proteína Interactuante Con La Tioredoxina (Txnip) En Sujetos Diabéticos Tipo 2]

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Objective: To investigate the relationship between oxidative stress and biochemical parameters and the expression of TXNIP, IL-6, IL-1? and TNF-? in peripheral mononuclear cells (PMCs) from type-2 diabetic patients. Methods: We studied 60 males: 20 normal-weight type- 2 diabetic patients (NW), 20 obese diabetic patients (OB) and 20 controls (C). Biochemical and oxidative stress parameters were evaluated. PMCs were isolated and total RNA was extracted in order to determine the expression of TXNIP, IL-6, IL-1? and TNF-? by qRT-PCR. Results: OB had higher weight, BMI and abdominal circumference (One way ANOVA, p<0.0001). NW had higher fasting glycemia (One way ANOVA, p=0.0034) however OB had higher HbA1c (One way ANOVA, p<0.0001). OB also had higher hsCRP (One way ANOVA, p=0.0158). TBARS and AGES were elevated in both NW and OB (One way ANOVA, p<0.0001 and p=0.0008, respectively). Compared to OB and C participants, the expression of TXNIP was significantly higher in NW (Kruskal Wallis, p=0.0074); IL-1?, IL-6 and TNF-? transcripts were higher in NW and OB (Kruskal Wallis, p<0.0001, for all). In NW patients, the expression of TXNIP was positively correlated with fasting glycemia and AGES and negatively correlated with HOMA-? (r=0.72; r=0.59; r=-0.44, respectively, for all p<0.05), in OB there was correlation only with 8-Isoprostanes (r=0.42, p=0.046). Conclusions: Our results suggest that fasting glycemic control, independent of adiposity and nutritional status, represents a risk factor for ?-cell dysfunction, increases oxidative stress markers and it is related with an elevation of TXNIP expression.

AGEs

Glycemic control

Inflammation

TXNIP

?-cell function

Callithrix

8-epi-prostaglandin F2alpha

advanced glycation end product

antidiabetic agent

carrier protein

glucose blood level

glycosylated hemoglobin

IL6 protein, human

insulin

interleukin 1beta

interleukin 6

lipid

prostaglandin F2 alpha

thiobarbituric acid reactive substance

tumor necrosis factor alpha

TXNIP protein, human

adult

analogs and derivatives

analysis

anthropometry

blood

body mass

body weight

complication

Diabetes Mellitus, Type 2

female

genetics

glucose blood level

human

inflammation

male

middle aged

obesity

oxidative stress

Adult

Anthropometry

Blood Glucose

Body Mass Index

Body Weight

Carrier Proteins

Diabetes Mellitus, Type 2

Dinoprost

Female

Glycosylation End Products, Advanced

Hemoglobin A, Glycosylated

Humans

Hypoglycemic Agents

Inflammation

Insulin

Interleukin-1beta

Interleukin-6

Lipids

Male

Middle Aged

Overweight

Oxidative Stress

Thiobarbituric Acid Reactive Substances

Tumor Necrosis Factor-alpha