INTRODUCTION: Progesterone has been implicated in gestational diabetes (GD) development mostly due to the increase of insulin resistance on periphery tissues. In addition, it has been shown that this hormone is able to induce pancreatic beta cell death through a free radical generation-dependent mechanism and oxidative stress, which has been related to GD development; however, the molecular events underlying the progesterone action upon pancreatic beta cells remains unclear.

OBJECTIVES: The aim of this work was to investigate if progesterone is able to modulate antioxidant/oxidant gene expression in insulin-producing cells.

MATERIAL AND METHODS: RINm5F cells were cultivated in RPMI, 10% fetal bovine serum, 5% CO₂ and humidified atmosphere. Cells were treated with progesterone (0 to 100 μM) for 6 or 24 h, in the culture conditions. After these periods, total RNA extraction and purification were carried, and cDNA was obtained. cDNA was used to evaluate the expression of 84 genes involved in oxidative stress pathway, using the quantitative RT² PCR Array system, based on SYBR Green fluorescence detection.

RESULTS: It was observed that the expression of 40 from 84 genes was changed up to 3-fold in comparison to untreated cells in at least one progesterone concentration and one time of exposure. Most of the changes were observed in cells treated with 100 μM PG for 6 h, through the down regulation of genes related to: response to oxidative stress (Dhcr24, Apx, Ercc2 and 6, Nqo1), oxygen transporters (Cygb, Dnm2) and superoxide metabolism (Noxa1, Noxo1). Among the main antioxidant enzymes only members of GPx family (GPx 6 and 7) were up regulated.

DISCUSSION: These results corroborate the hypothesis that progesterone modulates the redox state of pancreatic beta cells and may be involved in DG pathophysiology through a mechanism that relies on oxidative stress.

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