ENDOPLASMIC RETICULUM STRESS IN HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS FROM PRE-GESTATIONAL MATERNAL OBESITY

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Pre-gestational maternal obesity (PGMO) is associated with adverse cardio-metabolic newborn outcome. Our previous results show insulin-desensitization in human umbilical vein endothelial cells (HUVECs) from PGMO. The endoplasmic reticulum stress (ERS) has been related to the development of obesity-associated insulin resistance. However, whether HUVECs from PGMO show ERS is unknown.

Objective: To assay whether HUVECs from women with PGMO show increased ERS markers.
Methods: HUVECs were isolated from normal or PGMO pregnancies from the Hospital Clínico UC-CHRISTUS and Hospital San Juan de Dios (Chile). We evaluated the protein level of CCAAT-enhancer-binding protein homologous protein (CHOP), tribbles-like protein 3 (TRB3), and phosphorylation and total protein level of protein kinase RNA-like endoplasmic reticulum kinase (PERK), eukaryotic translation initiator factor 2-alpha (eIF2α), inositol-requiring enzyme 1-alpha (IRE1α), and c-jun N-terminal kinase 1 (JNK1) by western blot. X-box binding protein 1 (XBP1) mRNA processing was evaluated by PCR.
Results: Activator phosphorylation of PERK (1.9 ± 0.4 fold) and eIF2α (1.8 ± 0.5 fold), and protein abundance for CHOP (2.5 ± 0.7 fold) and TRB3 (1.9 ± 0.3 fold) were increased ($P<0.05$, n = 4) in HUVECs from PGMO compared with normal pregnancies. Activator phosphorylation of IRE1α and JNK1 were unaltered, and there was not processing of XBP1 mRNA.
Conclusions: HUVECs from women with PGMO show ERS by activation of PERK branch, suggesting that PERK branch-associated ERS could result in PGMO reduced foetoplacental endothelial function. The increase of TRB3 protein level suggests this protein's potential role as inductor of insulin desensitization in this type of foetoplacental endothelium.
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MATERNAL - FETAL COMMUNICATION: ROLE OF FETAL ESTROGENS IN PORCINE PREGNANCY

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Pregnancy in the pig is characterized by rapid development and endocrinological changes involving the conceptus and the uterine environment. Progesterone and oestrogens act through their specific receptors. Progesterone receptors (PGRA and PGRB) and oestrogens receptors (ERα and ERβ) have been shown to have different functional activities.

Objectives: This work was performed to investigate: a) progesterone and oestrogens concentration in serum from mother and placental extracts from maternal and fetal homogenates (HoPM y HoPF), b) PGRA, PGRB, ERα, ERβ expressions in endometrium of non-pregnant sows and porcine placenta of 5, 17, 30 and 70 days of gestation (dg).
Methods: Genital tracts from pregnant (n = 16) and non-pregnant sows (n = 8) were obtained at the slaughterhouses. Immunohistochemmistry was used to explore PGRA, PGRB, ERα, and ERβ, while progesterone and estrogens concentrations were measured by chemiluminescence.
Results: At 17 and 70 dg a significant ($P<0.05$) increase of oestrogens in the HoPF (17 dg = 12 ± 0.65 fold; 70 dg = 3.69 ± 0.18 fold) was observed. Trofoblastic ERβ nuclear immunoexpresion was observed only at 17 and 70 dg. Maternal tissues expressed ERβ in endometrial glands until 17 dg while PGRA was expressed at all studied stages.
Conclusions: Although progesterone is the hormone that maintains gestation, the results suggest that foetal oestrogens binding to trophoblastic ERβ promotes the synthesis and release of signal molecules related to maternal immunotolerance and subsequent placental remodelling.

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IL-1β, IL-2, IL-4 AND IL-10 PROFILE DURING PORCINE GESTATION

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During gestation, a dialogue is carried out between the conceptus and the endometrium involving the immune system in order to minimize the embryo rejection probabilities. The porcine placenta is epitheliochorial, non-invasive, adecidua, folded, and diffused.

Objectives: Concentration of interleukins 1β (IL-1β), 2 (IL-2), 4 (IL-4), and 10 (IL-10) in serum from mother and porcine placental extracts from different gestation periods was determined.
Methods: Crossbred female placental samples (n = 25) of 17, 30, 60, 70, and 114 days of gestation (dg) and non-pregnant uterus (n = 5) were used. Interleukins determination was performed by ELISA.
Results: IL-1β, IL-2, and IL-4 showed two peaks of concentration at the placental interface ($P<0.001$) at 30 dg (127, 915, and 2574 pg/ml, respectively) and 70 dg (254, 2298, and 5261 pg/ml, respectively) with significant decrease at term (IL-1β <8.2 pg/ml, IL-2 163.2 pg/ml, IL-4 803 pg/ml), the only period in which they increased in serum (IL-1β 306 pg/ml, IL-2 1477 pg/ml, IL-4 3930 pg/ml). In serum IL-10 increased at 17 (11.6 pg/ml), 60 (15.6 pg/ml), and 114 (19.4 pg/ml) dg, whereas placental tissue concentrations during gestation were unaltered.
Conclusions: At 30 and 70 dg there are profound placental structural changes that allow the exponential growth of placenta and foetuses, respectively, and IL-1β, IL-2, and IL-4 present at the interface would favor placental remodelling. Its significant increase in serum at the end of gestation would facilitate the delivery and the expulsion of the placentas. Significant IL-10 increase in serum at 17, 60 and 114 dg could indicate its immunoregulatory role at a systemic level during the swine gestation.
CV is Becaria CONICET (Argentina).

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PLACENTAL *TRYPANOSOMA CRUZI* INFECTION IS RESTRICTED BY NITRIC OXIDE PRODUCTION BY ENDOTHETIAL NITRIC OXIDE SYNTHASE ISOFORM

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