Category: Cardiovascular physiology

PRR analysis in rat retina tissue with complicated pregnancy with Preeclampsia

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Introduction: In pregnancy, women experience profound physical, morphological and metabolic changes. Alterations in these changes cause complications such as preeclampsia (PE). This is characterized by proteinuria, increased blood pressure levels and changes in vascular beds. Its etiology is unknown, but it is attributed an important role in its appearance in the Renin Angiotensin Aldosterone System (RAAS), a key system for the regulation of blood pressure, expressed locally in different tissues (including the retina), and whose components they could be involved in the appearance of ocular complications related to the increase in blood pressure, such as Hypertensive Retinopathy (HR). The retina is a sensory layer that, under high blood pressure, has a set of signs that affect it (HR) and that in advanced phases can reduce vision. The HR is presented in four stages according to Keith and Wagener. While in a pregnant woman the retina does not present changes, in women with PE it is possible to see moderate narrowing or sclerosis of the arteries, which corresponds to stage I according to these authors. Moreover, if a woman who has had previous PE develops later hypertension, the retinal changes develop much faster. In HR, there is an increase in vascular permeability and the production of proteins that are activated under hypoxic conditions such as VEGF and PEDF, which seem to play a central role in the development of HR.

Objective: To determine if the components of the RAAS present in the retina could be modified during PE and during arterial hypertension of rats with a history of PE, and induce the changes of the HR through VEGF and PEDF.

Material and Methods: We used adult female Wistar rats to whom PE was induced by subrenal aortic coarctation. A group of these rats was allowed to give birth and, 30 days later, HTA was induced by the administration of L-NAME, 30 mg / Kg, VO for 30 days. The animals were managed according to the Official Norm for the handling of laboratory

animals 062-ZOO-1999. The fundus was assessed and the retina was removed to measure the permeability markers, VEGF and PEDF, and the components of the RAAS AT1R and PRR by the immunoblot method.

Results: In rats with PE, VEGF, PEDF, AT1R and PRR were significantly increased compared to a healthy pregnancy. No changes were observed in the fundus of the PE groups compared with those of healthy pregnancy. In rats with hypertension and with a history of PE, there was no change in the expression of VEGF and PEDF with respect to the group with a history of healthy pregnancy. The proteins AT1 and PRR showed a significant increase in their expression in hypertensive rats with a history of PE compared to the group of hypertensive rats with a history of healthy pregnancy. **Conclusions:** Our results suggest that there is an incipient process of RH in PE due to the increase in vascular permeability and release of VEGF and PEDF, but without macroscopic changes in the retina. The increase of RAAS components in the retina of rats with PE could suggest their participation in the increase of vascular permeability during PE. In rats with HBP and with a history of PE we did not find an increase in vascular permeability, so the changes found could be due to the increase in the components of the RAAS.

Keywords: retina, pregnancy, preeclampsia, rats, renin angiotensin aldosterone system