

# X ISNIM CONGRESS & III SIPNEI CONGRESS

## HEART RATE DYNAMICS AND SERUM INFLAMMATORY MARKERS DURING PREGNANCY AND ACTIVE LABOR IN WOMEN

**J Javier Reyes-Lagos<sup>1</sup>, Miguel Ángel Peña-Castillo<sup>1</sup>, Juan Carlos Echeverría<sup>1</sup>, Gilberto Pérez-Sánchez<sup>2</sup>, Samantha Alvarez-Herrera<sup>2</sup>, Enrique Becerril-Villanueva<sup>2</sup>, Lenin Pavón<sup>2</sup>, Rodrigo Ayala-Yáñez<sup>3</sup>, Ramón González-Camarena<sup>4</sup>, Gustavo Pacheco-López<sup>5</sup>**

<sup>1</sup> Basic Sciences and Engineering Division, Metropolitan Autonomous University (UAM), Campus Iztapalapa, Mexico; <sup>2</sup> Department of Psychoimmunology, National Institute of Psychiatry (INPRFM), Mexico; <sup>3</sup> Maternal and Childhood Research Center (CIMIGen), Mexico; <sup>4</sup> Biological and Health Sciences Division, UAM, Campus Iztapalapa, Mexico; <sup>5</sup> Biological and Health Sciences Division, UAM, Campus Lerma, Mexico.

To investigate whether inflammation plays a role in term active labor we assessed short-term heart rate dynamics and circulating cytokines. Healthy women ( $n=20$ ; mean age  $24.1 \pm 4.9$  years) were longitudinally studied at the third trimester of gestation (3G) and at term active labor (AL) to measure consecutive cardiac autonomic indices derived from heart rate variability (HRV) analysis and circulating maternal inflammatory markers, which included serum levels of the interleukin (IL)-10 family (IL-10, IL-20, IL-22 and IL-28A). The presence of 3 - 4 uterine contractions in 10 minutes, cervical dilatation and effacement of at least 4 cm and 50%, respectively, identified outgoing AL. A canonical correlation analysis was used to summarize the relationship between HRV and cytokines during 3G and AL. During AL significant changes were observed in the short-term heart rate dynamics, showing higher values of  $\alpha_1$  (above 1.0), which indicate a more regular behavior, as well as a weakly anticorrelated pattern (indicated by higher values of  $\alpha_{1(\text{SIGN})}$ ,  $p < 0.05$ ) in comparison to the 3G. No significant changes were manifested in other HRV parameters. Additionally, the concentrations of IL-10, IL-20, IL-22 and IL-28A were significantly diminished at AL in comparison to 3G ( $p < 0.05$ ). Moderate but significant canonical correlation (0.752) was found between HRV parameters linked to vagal function and the IL-10 family during AL. The systemic downregulation of several members of the IL-10 cytokines family may play an active role in the activation of the myometrial smooth cells associated with uterine contractions at AL. Likewise, the regular and weaker anticorrelations of the maternal fluctuations at labor could then reflect a different interplay between the sympathetic and parasympathetic branches. Finally, the finding that some IL-10 family members are correlated to vagal HRV parameters suggests a link between inflammation and the autonomic regulation in pregnancy and labor.