

Spontaneous Unexplained Preterm Labor With Intact Membrane: Finding Protein Biomarkers Through Placenta Proteome

ABSTRACT

Spontaneous unexplained preterm labor with intact membrane (sPTL-IM) remains as an unresolved challenge in obstetrics due to the complex syndromes involved during preterm birth. Two dimensional-gel electrophoresis (2D-GE) coupled with matrix-assisted laser desorption/ionization-time of flight/time of flight (MALDI TOF/TOF) mass spectrometry has become an alternative in screening for potential novel protein-based biomarkers and revealing the pathophysiology of sPTL-IM. To achieve this objective, protein extracted from fetal and maternal sides of the placenta obtained from sPTL-IM (n = 5) and the respective control (n = 10) groups were separated and compared using 2D-gel electrophoresis. MALDI-TOF/TOF mass spectrometry was utilized to identify the differentially expressed proteins between both groups, and the molecular functions of these proteins were studied. A total of 12 proteins were significantly differentiated in sPTL-IM over the control. Differentially expressed proteins were identified to have involved in structural/cytoskeletal components, immune responses, fetal and placenta development, and anticoagulation cascade. More proteins were found to be differentially expressed in the fetal side compared to the maternal side of the placenta. This postulates that the influence of sPTL-IM from fetus is greater than that of the mother. Ultimately, these results might lead to further investigations in elucidating the potential of these proteins as biomarkers and/or drug targets.

Keywords; Comparative placenta proteomics; 2D-gel electrophoresis; MALDI-TOF/TOF; Placenta tissues; Proteomic; Spontaneous unexplained preterm labor