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Markers of endothelial activation and injury: Influence of the mode of delivery

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Statement of the Problem: Complications during delivery may result in activation and injury of endothelial cells. There is limited information regarding endothelial dysfunction during pregnancy, delivery and in newborns. The purpose of this study was to explore biomarkers of endothelial injury in different modes of delivery and in newborns after delivery.

Method: The study group (Thomayer Hospital Prague, Czech Republic) consisted of mothers and their term healthy newborns after uncomplicated pregnancy and spontaneous delivery (Group A, n=24), after elective cesarean section (Group B, n=12) and after emergency cesarean section (Group C, n=13). Biomarkers were measured in cord blood and in newborns between 48 and 72 hours of life using multiplex immunoassays based Luminex®xMAP multi-analyte profiling platform. Paired t-test and Mann-Whitney test were used for statistical evaluation of the results.

Findings: Significantly higher concentrations of endocan, angiopoietin-2, VEGF and ICAM-1 were found in neonatal samples comparing to cord blood in all three groups ($p<0.05$). Significant differences were found in cord blood (endocan, angiopoietin-2, VEGF, endothelin-1 and endoglin) when comparing B and C groups ($p<0.05$).

Conclusion: We found different concentrations of endothelial markers in cord blood compared to neonatal samples. The measured markers according to the mode of delivery showed differences mainly between elective B and acute C cesarean section groups in cord blood. These results show significant changes in concentrations of several potential endothelial dysfunction markers during the first three days following delivery. Concentrations of endothelial markers may be influenced more by complication of pregnancy, e.g. hypoxia leading to acute cesarean section, than by mode of delivery itself.

Biography

Jan Zivny has completed his M.D. in 1993 and Ph.D. in 2000 from First Medical Faculty of Charles University at Prague. He completed postdoctoral fellowship at the University of Alabama at Birmingham School of Medicine and ORISE fellowship at Food and Drug administration (FDA). He is associate professor at the Institute of Pathological Physiology, First Faculty of Medicine, Charles University at Prague. His work focuses on the biomarkers endothelial activation in health and disease and on pathophysiology of hematological malignancies. He has published more than 40 papers in reputed journals.

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