Bronchopulmonary dysplasia (BPD) contributes to significant morbidity of infants with birth weight<1000g. Experimental and clinical research of dissertation thesis has focused on two interventions which might have positive influence on the postnatal development of the immature lung.
In animal experiment, we tested the capability of retinoic acid (RA) to attenuate hyperoxic lung injury after seven days exposure to 40% or 80% hyperoxia. RA significantly attenuates the 80% hyperoxic growth retardation. The histological changes were attenuated in the lungs of 40A and 80A groups. The expression of the VEGF-A gene was not significantly influenced by RA in 80% hyperoxia. In another experiment, we detected significant increase of the expression of the gene of proinflammatory cytokine TNF- after 72 hours exposure both to 40% and 80% hyperoxia.
Mechanical ventilation still remains one of the risk factors of BPD. The management of optimal lung volume strategy is more difficult during HFOV than conventional ventilation. Efficacy and safety of HFOV is hampered by a lack of reliable bedside in-line monitoring of the patient. We determined the values of expiratory tidal volume measured by hot-wire anemometr and assessed the relationship among VTE and other respiratory parameters. We evaluated how often VTE exceeds the value of the dead space during HFOV. 214 simultaneous measurements of PaCO2, VTE, FiO2, CDP, frequency and amplitude were obtained from 28 patients. The VTE measurement by heated double wire anemometer sensor is feasible, provides useful real time information about tidal volume changes and may improve clinical management of HFOV.