

Adams JA, Mangino MJ, Bassuk J, Sackner MA. Hemodynamic effects of periodic G(z) acceleration in meconium aspiration in pigs. J Appl Physiol. 2000 Dec;89(6):2447-52.

Division of Neonatology, Mount Sinai Medical Center, Miami Beach, Florida 33140, USA.

The hemodynamic effects of periodic acceleration ($pG(z)$), induced in the spinal axis with noninvasive motion ventilation (NIMV), were studied in a piglet model of pulmonary hypertension associated with meconium aspiration. Animals ($n = 12$) were anesthetized, paralyzed, intubated, and supported by conventional mechanical ventilation (CMV). Thirty minutes after tracheal instillation of meconium solution (6 ml/kg), either CMV ($n = 6$) was continued or NIMV ($n = 6$) was initiated. Changes in systemic and pulmonary hemodynamics and arterial blood gases were tracked for 2 h after aspiration. Thermodilution, cardiac output, and heart rate were not significantly different after meconium aspiration in the $pG(z)$ group relative to the CMV controls. Aortic pressure and systemic vascular resistance were significantly lower (approximately 30%) after meconium aspiration in NIMV animals relative to CMV animals. Pulmonary arterial pressure and pulmonary vascular resistance were also significantly lower, by 100%, after aspiration of meconium in the NIMV animals compared with the CMV controls. Meconium aspiration significantly decreased total respiratory compliance by approximately 50% and increased total respiratory resistance by approximately 100% in both CMV and NIMV animals, but such alterations did not differ between the two groups. Both CMV and NIMV satisfactorily supported ventilation in these paralyzed animals. In conclusion, NIMV through $pG(z)$ in the spinal axis decreased systemic and pulmonary vascular resistance in piglets after meconium aspiration.