

Tidal breathing pulmonary function and influencing factors in late preterm and full-term neonates

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Abstract

Neonatal period is the key stage of lung development. However, tidal breathing pulmonary function (TBPF) of late preterm and full-term infants without pathology has rarely been studied. Our research focuses on the early neonatal period and aims to detect the factors influencing PF and implement effective interventions earlier. Methods: This prospective study evaluated the PF characteristics of 142 infants admitted to our neonatology department. Potential explanatory variables for TBPF were analyzed using single-factor and multi-factor linear regression analyses. Results: PF characteristics, including tidal volume (VT) and minute ventilation (MV), were significantly lower in late preterm infants compared to full-term infants ($P < 0.01$). TPTEF/TE and VPTEF/VE were not significantly different between groups ($P > 0.05$). In the single-factor analysis, changes in parameters related to lung volume (VT, VT/kg, MV) were mainly correlated with gestational age (GA), corrected GA, birth weight, weight at examination, weight changes, and serum albumin(SAB). After birth, VT/kg and indicators of airway obstruction (VPTEF/VE and TPTEF/TE) changed significantly with increasing age. In the multiple-factor analysis, the main factors influencing VT, VT/kg, and MV were corrected GA and daily weight change, GA and corrected GA, and corrected GA and SAB, respectively. Conclusion: The main difference in PF between full-term and late premature infants was the lung volume. In these newborns PF was associated with GA, corrected GA, daily weight change, and SAB level. These results suggest that an adequate energy supply is critical for PF development in neonates, and especially for premature infants.

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