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High-frequency oscillatory ventilation: What is new?

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High-frequency oscillatory ventilation (HFOV) was developed as a new technique of ventilation technique in late seventies, twenty years after the invention of the first artificial respirator. In this mode of ventilation, tidal volumes are smaller than anatomical dead space and respiratory rate is supra-physiological. Animal models showed that HFOV was able to achieve adequate gas exchange with lower inflation pressure at the alveoli with a relatively constant volume above the functional residual capacity leading to significant mitigation of preterm lung injury in the form of volutrauma, barotrauma and atelectrauma. However, early clinical trials failed to demonstrate consistently, favorable results in terms of pulmonary outcome when compared to standard modes of ventilation. Subsequent emergence of volume guarantee (VG) in combination with HFOV made it possible to play with frequency and tidal volume. The addition of VG setting to the ventilator can help to optimize ventilation (stable carbon dioxide removal) as well as oxygenation. Currently, attempts are being made to determine the highest frequency and the lowest tidal volume according to gestational age and birth weight to define a new lung protection strategy. Indeed HFOV with or without VG is increasingly used in preterm infants with respiratory failure. Current evidence suggests that early HFOV could reduce lung injury in combination with an open lung strategy. Nasal HFOV has come up as the newest mode of high-frequency ventilation in neonates. The latest evidence suggests that following surfactant administration, nasal HFOV could be superior to nasal CPAP in preterm infants with moderate to severe RDS without increase in adverse effects.

Biography

Prashanth Gouda has completed his Graduation in Medicine at Rajiv Gandhi University Bangalore and Postgraduate studies at King George Medical University, Lucknow, India. He has served at several reputed medical institutions and research centers in India including KLE University and PGIMER Chandigarh. Currently, he serves as the Faculty of Pediatrics in College of Medicine and Health Sciences at National University of Science and Technology, Muscat, Oman. He has published more than 40 papers in various journals and has been serving in reputed international pediatrics and neonatology journals as Editorial Board Member and Referee.

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