

Higher or lower tidal volume – An eternal dilemma

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Abstract

Introduction: Preterm infants often require mechanical ventilation. Volume targeted ventilation has been shown to reduce both complications and the duration of mechanical ventilation. Recommended tidal volumes vary from 4-8 mL/kg, but the optimal tidal volume remains elusive.

Aim: To compare a lower (4-5 mL/kg) to a higher (7-8 mL/kg) tidal volume during volume guarantee ventilation (VG) of respiratory distress syndrome (RDS) in very preterm infants.

Method: The randomized trial was conducted at North Tees Hospital from 2013-2016. Babies <32 weeks' gestation or <1500 grams birth weight and requiring mechanical ventilation within 12 hours of life from RDS were included in the study. Babies were randomized to receive lower (4-5 mL/kg) or higher (7-8 mL/kg) tidal volume using VG. The dead space was kept consistent by using standardized trimming of the ET tube. Subjects all received surfactant and were managed by a strict protocol with rescue by high frequency ventilation for defined criteria. The primary outcome was the time to achieve a 25% reduction from the initial peak inspiratory pressure (PIP). Secondary outcomes included the duration of mechanical ventilation, as well as respiratory and non-respiratory complications. The data were analysed using SPSS® version 20.0.

Result: During the study period, 70 of 97 (72%) eligible infants were enrolled. The groups were similar. The primary outcome, time to reduce PIP (median [IQR]) were 13.6 (8.8 – 25.2) hours and 17.4 (7.7 – 27.8) hours, respectively, for higher and lower Vt (p=0.678). The total duration of ventilation (median [IQR]) on higher vs lower tidal volume was 33.3 (22-368.8) and 61.8 (15.4-177.5) hours, respectively (p=0.959). There were no differences between the two groups for respiratory and non-respiratory complications of prematurity.

Conclusion: This study failed to find differences in lower versus higher tidal volume delivery in a small population of infants with RDS. It is possible that both tidal volume ranges selected for study are at functional residual capacity.

Biography

Anupam Gupta is a consultant Neonatologist at Saint Mary's Hospital, Manchester UK. This is the biggest neonatal unit in the United Kingdom dealing with extreme prematurity, surgical and cardiology babies. He had trained and worked in world famous and prestigious Pediatric and neonatal centres in India and UK and developed an expertise in neonatal ventilation and research. This is first ever study in the world to address this question in the world and for this he was awarded PhD by Durham University for the same. He has carried out award winning projects and presented in prestigious international conferences like PAS, EAPS, ESPID, UENPS and helped to organize neonatal conferences here in the UK. He was one of the moderators for an international Paediatric online discussion group. He aimed to develop a platform for cooperation in neonatal education and multi-centre research.



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