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Controlled oxygen therapy to neonates by oxygenhood in the absence of oxygen analyzer

Sunil Kumar Jatana
Melaka Manipal Medical College, Malaysia

Background: A study was conducted to evaluate and to evolve a system of standardizing the oxygen concentration inside the oxygen hood and to develop guidelines for controlled FiO_2 administration by changing size of the hood, lid position on the hood and the oxygen flow rate, without an oxygen analyzer. The effect of low flow rates on carbon dioxide (CO_2) retention inside the head box was also studied.

Design Settings & Method: A dummy patient and thirty neonates, requiring oxygen to be delivered through head box, constituted the material for the study group. Oxygen content in the head box was measured using a standard oxygen analyzer while the size of head box, flow rate and lid position were changed independently and in combination. The head boxes were tested on a dummy patient. These results were analyzed. A general guideline was derived and was applied to thirty neonates requiring oxygen therapy using head box. Multiple readings were taken. Data thus collected was tabulated, statistically analyzed, and appropriate conclusions were drawn.

Results: Volume of head box had an inverse relation with the oxygen concentration inside the head box. A smaller sized head box achieved better and more predictable oxygen concentration at all flow rates. Maximum difference in oxygen concentration by varying the lid position was observed in the large head box. Keeping the variables constant, oxygen concentration was lower in babies as compared to dummy, which is statistically significant. No significant CO_2 retention was found at flow rate of 4 L/pm in a small and 3 L/pm in a medium & large head box respectively.

Conclusion: It is possible to predict the oxygen concentration inside the head box depending upon various variables without the use of oxygen analyzer. Larger the size of the head box and higher the lid position, lesser the oxygen concentration achieved at a given oxygen flow rate. Oxygen concentration achieved in babies is lesser than the concentration achieved in a dummy. Flow rates of less than 4L/pm in small and 3 L/pm in medium and large sized head boxes are associated with CO_2 retention.

Biography

Sunil Kumar Jatana has completed his MBBS and Post-graduation (MD) in Paediatrics, from Armed Forces Medical College, Poona University, India. He has served in various teaching and other hospitals of Armed Forces, India for 36 years followed by Professor of Pediatrics in D Y Patil Medical College, Pune, India and currently working as Professor of Pediatrics in Melaka Manipal Medical College, Malaysia. He is a recognized Under-graduate and Post-graduate Teacher and Examiner of MBBS, DCH & MD of various universities in India. He was the Executive Editor of *Medical Journal Armed Forces India* in the past and is a referee for 2 medical journals in India. He has published 15 papers, presented many papers and chaired scientific sessions in national conferences. He is a member of Indian Academy of Pediatrics and has been a member of Executive Board, Indian Academy of Pediatrics in 2011.

suniljatana@hotmail.com

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