Measuring the Sedation Level of Mechanically Ventilated Infants by a Modified COMFORT Scale

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Abstract
This prospective observational study aimed to measure the internal consistency and inter-rater agreement of the modified COMFORT scale for mechanically ventilated patients in a neonatal intensive care unit. A sample of 15 infants requiring mechanical ventilation, generating a total of 27 observations, was recruited. Three different observers including a doctor, a nurse and a senior nurse independently assessed the sedation level of each patient. The measurement tool was modified from the original COMFORT scale. The Spearman's correlation coefficients for the inter-rater agreement between doctors and senior nurses, doctors and nurses as well as nurses and senior nurses on the total scores were 0.760, 0.626 and 0.776 respectively, all p<0.05. The reliability coefficient alpha for the internal consistency was 0.804. We suggest that the modified COMFORT scale may be an appropriate tool to observe sedation level for mechanically ventilated infants. More studies may be required for validation and outcome assessment.

Key words Neonatal intensive care; Scale; Sedatives; Ventilation

Introduction
The importance of adequate sedation and analgesia in critically ill patients was well recognised. The administration of sedation for anxiety and agitation was recommended in intensive care unit (ICU). Mechanical ventilation was one of the common causes of discomfort encountered in the ICU that might induce anxiety and ventilator dys-synchrony. Despite the advances in ventilator technology, the demand for adequate sedation still existed. Potential benefits of sedatives for mechanically ventilated patients included reduction of oxygen consumption and stress response, improved ventilation and reduced risk of barotrauma, improved patient care and comfort. Unplanned extubation was also found to be associated with under-sedation. On the other hand, potential risks of sedative medications were present. They included cardiovascular effects and drug interaction which might be more prominent in patients with multigorgan failure, especially those with hepatic and renal failure. Moreover, the use of continuous intravenous sedation might be associated with the prolongation of mechanical ventilation and ICU stay as well as other consequences such as physical dependence, tolerance and withdrawal. The use of sedation was more controversial in neonates because of the debate of their potential benefits to reduce complications such as intraventricular haemorrhage, pneumothorax and the stress responses against the potential complications. Recently, health care professionals have now realised that agitation and stress have adverse effects on neonatal well being. The practice of administering sedation to infants requiring mechanically ventilation is now generally accepted. However, determination of an optimal sedation level and quantitative measurement of this qualitative endpoints become the new challenge. Various scoring systems have been used in the development of practice guidelines. A multidimensional scale, the COMFORT scale, was studied for critically ill paediatric patients. This study was