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Development and Implementation of Oxygen Titration Guideline in a Neonatal Unit

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Introduction

Preterm infants are sensitive to oxygen supply. Hypoxia may result in higher mortality rate, while hyperoxia is associated with retinopathy of prematurity (ROP) and chronic lung disease. There had been several important studies to define the desirable targeted oxygen saturation range for premature infant, but how to apply it in clinical settings is not straightforward. Nursing staff should have up-to-date knowledge and experience about oxygen supplementation to premature infants. It is equally important for the nursing colleagues to have a more consistent practice to adjust oxygen supplementation to the premature infants in order to minimize fluctuations of oxygen saturation

Objectives

To develop an oxygen supplement titration protocol for nurses to adjust oxygen supplement for preterm infants to keep their oxygen saturation stably within the desirable range

Methodology

1. An oxygen supplement titration guideline for adjustment of oxygen supplement to preterm infants cared in neonatal intensive care and special baby care unit at Queen Mary Hospital 2. The protocol was posted at prominent site at every cubicle of the neonatal ward. 3. Visual cue cards with desirable oxygen saturation range and alarm limit for early preterm (<34 weeks) and late preterm (34-37weeks) infants were prepared respectively. 4. An education program was delivered to all the nurses with less than five years' nursing experience. All nursing staff was informed and well aware of the implementation of the new protocol. The protocol was implemented on 1st June 2013. 5. Pre-implementation assessment of nursing practice was conducted over a period of 4 days in December 2012. Post-implementation evaluation was repeated over a period of 4 days in mid of June 2013, at 1 week after the protocol was initiated.

Result

A total of 9 and 10 preterm babies were cared during the 4-day study period before

and after the implementation of protocol respectively. The total number of hourly saturation monitor readings included for analysis was 480 and 663 respectively. In the pre-protocol period, the number of saturation monitor readings indicating excessive supplement and under supplement were 73 (15.2%) and 0 respectively. The number of saturation monitor readings indicating excessive supplement was significantly decreased to 55 (8.3%) in post-protocol period ($p < 0.001$). The oxygen saturation monitor reading indicating under-supplement remained nil. Among the 10 pre-term babies cared in the post-protocol period, the upper alarm limits of saturation monitor were incorrectly set for 2 babies while all the lower alarm limits of saturation monitor were correctly set. Ten visual cue cards were posted up for 10 preterm babies and 3 of the cards were incorrectly placed

Conclusion An oxygen supplement titration protocol for preterm infants was designed and implemented. There was a significant decrease in the number of oxygen saturation monitor indicating excessive supplement after the protocol was implemented. The evaluation should be performed at interval to see if the improvement can be sustained and if the incidence of neonatal complications related to hyperoxia can be reduced in the long term