



ORIGINAL ARTICLE

A survey of inotrope and vasopressor line change practices in Australian and New Zealand Neonatal Intensive Care Units



Sally Jeston ^{a,*}, Susan McDonald ^b, Wendy Pollock ^c

^a Neonatal Intensive Care Unit, Mercy Hospital for Women, 163 Studley Rd., Heidelberg, Victoria 3084, Australia

^b Midwifery (Incorporating Neonatal Nursing Studies and Child, Family Community), La Trobe University/Mercy Hospital for Women, Mercy Hospital for Women, Level 2, 163 Studley Rd., Heidelberg, Victoria 3084, Australia

^c La Trobe University/Mercy Hospital for Women Midwifery Professorial Unit, Level 2, Mercy Hospital for Women, 163 Studley Rd., Heidelberg, Victoria 3084, Australia

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KEYWORDS

Inotrope;
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Abstract *Introduction:* Sick and or preterm neonates who are admitted to the Neonatal Intensive Care Unit (NICU) frequently require inotropes and vasopressors which support the cardiovascular system to function adequately. There are many different clinical practices that nurses can adopt to perform inotrope and vasopressor infusion line and syringe changes, some of which have the theoretical potential to cause fluctuations in blood pressure. The purpose of this study was to identify current inotrope infusion line change practices in the neonatal intensive care population of Australia and New Zealand and examine what drives these current clinical practices.

Methodology: An observational, exploratory quantitative study was carried out in all 28 Australian and NICUs. An electronic survey tool was distributed to one member of each unit who responded on behalf of their clinical setting.

Results: The results showed that variation exists in the practice of inotrope and vasopressor line change practices across the 22 participating NICUs. The most popular method was the quick change method with 54.5% of Neonatal Intensive Care Units implementing this practice in their unit. The most frequently reported basis for current practice was literature (54.5%) followed by expert opinion (40.9%), previous clinical practices (36.4%) and multidisciplinary consensus (22.7%).

* Corresponding author.

E-mail address: sallyjeston@gmail.com (S. Jeston).

Conclusion: This study has identified areas requiring further research in order for a standard, safe and efficient practice to be implemented in the Neonatal Intensive Care Unit for these critically sick neonates.

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Introduction

Disruption to the normal pregnancy and birth transition process to newborn life occasionally occurs. Sick and premature neonates who require intensive medical attention are admitted into a specialised unit, the neonatal intensive care unit (NICU) (Gardner et al., 2010).

Preterm and term neonates are admitted to the NICU with a variety of medical and surgical conditions can be provided with respiratory, cardiovascular, neurological, metabolic, nutritional and developmental support (Gardner et al., 2010). Sick and very preterm neonates may not be able to maintain their own blood pressure through normal homeostatic mechanisms.

Close to half of all neonates admitted to the NICU receive cardiovascular intervention for hypotension (Seri and Evans, 2001). The decision to treat a neonate for hypotension is generally based on clinicians' opinions and 'normal' blood pressure values based on gestational age of the neonate plus the days in postnatal age as opposed to data bearing physiological reference (Gardner et al., 2010; Seri and Evans, 2001).

The preterm population demonstrates the majority of the patients in the NICU with hypotension. Hypotension in the neonate can cause severe damage to the developing body systems and if left untreated can lead to death (Gardner et al., 2010). Some of the effects of low blood pressure include tissue hypoperfusion which can lead to organ damage and failure, development or progression of intraventricular haemorrhage and metabolic acidosis (Subhedar and Shaw, 2009; Victor et al., 2006).

Inotropes and vasopressors are two classes of medications that are used in neonates to assist the cardiovascular system to raise systemic blood pressure (Turner and Baines, 2011). Vasopressors are drugs that induce vasoconstriction thereby elevating systemic mean arterial pressure (Harris et al., 2005). Inotropes are drugs that affect cardiac function by enhancing the force of myocardial contraction (Harris et al., 2005). However the majority of drugs have combined effects of inotropes and vasopressors (Turner and Baines, 2011).

Due to the extremely short half-lives of most inotropes and vasopressors these drugs are intravenously infused at a continuous rate in the

neonatal population through syringe drivers to provide constant plasma concentrations. The dosage and usage recommendations outlined by the manufacturers of the inotropes and vasopressors state that regular changes are required to maintain full potency of the drugs (Morrice et al., 2004; Mims Online, 2011). The inotropes and vasopressors when prepared with the compatible solutions remain stable for only 24 h (Morrice et al., 2004).

The time taken and the method by which the process is performed can potentially have an effect on the neonate with cardiovascular compromise. Several methods are practiced for inotrope and vasopressor intravenous infusion changes (Table 1) (De Barbieri et al., 2009; Arino et al., 2004; Llewellyn, 2007; Argaud et al., 2007).

Aim

The aim of this research was to identify the clinical practice and the rationales influencing the clinical practice of inotrope and vasopressor solution and associated intravenous tubing line changes in neonates across all NICUs in Australia and New Zealand.

Method

Sample and setting

A descriptive observational quantitative research design was adopted to identify the methods currently in use for inotrope and vasopressor line changes. A web-based survey was created and distributed using Survey Monkey to either the Nurse Unit Manager or Clinical Nurse Educator of all 28 identified Neonatal Intensive Care Units across Australia and New Zealand. The names, addresses and email addresses were obtained from the Australian and New Zealand Neonatal network.

Inclusion criteria

Nurseries were included if they contained level III nursery beds, located in a surgical and/or perinatal centres and nurseries which utilise inotrope and vasopressors for cardiac support.

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