Journal of Neonatal Nursing (2016) xxx, xxx–xxx

ELSEVIER

Jnn

www.elsevier.com/jneo

EDUCATION ISSUES

Current practices on prevention of hypothermia and temperature taking in the preterm and term infant: A survey

Jacqueline Smith, DScN, MNursSc (NP), NNP, RSCN*

The Townsville Hospital, Neonatal Unit, Douglas, Townsville, Queensland, 4815, Australia

Available online ■ ■ ■

KEYWORDS
Prevention;
Hypothermia;
Newborn;
Methods;
Preterm

Abstract Over the last century there have been many ways in which clinicians can help reduce hypothermia in the preterm and term infant.

This survey has focused on ways in which different methods are used at both national and international countries in an attempt to manage hypothermia in the newborn infant.

Introduction/background

For many years, practitioners have known that hypothermia in the newborn preterm and term infant can be detrimental if left untreated. Prevention of hypothermia consists of many different factors; these include methods used at delivery to enable clinicians to minimise heat loss, transportation of the infant to the neonatal unit or theatre and what methods/devices are used to take an accurate body temperature. All methods can have a direct or indirect impact on thermoregulation (hypothermia/hyperthermia) of the newborn infant.

Infants are born wet into a cooler environment when compared to the womb (Cramer et al., 2005; Soll, 2008); for this reason they are at greater risk of hypothermia soon after birth.

Immediately after birth, body temperature can drop anywhere between 1 and 3 °C and a premature infant can drop 1 °C every 5 min (Laburn, 2001). Newborn infants, especially term infants, are known to be very resilient, they do not usually suffer any side effects to this sudden drop in body temperature, it also acts as a form of stimulation to breathe (Fellows, 2011), a catalyst for

* Tel.: +61 0422828959, +61 07 4433 3472.
E-mail addresses: jackiesmith3@me.com, jacqueline_smith@health.qld.gov.au.

http://dx.doi.org/10.1016/j.jnn.2016.04.001

Please cite this article in press as: Smith, J., Current practices on prevention of hypothermia and temperature taking in the preterm and term infant: A survey, Journal of Neonatal Nursing (2016), http://dx.doi.org/10.1016/j.jnn.2016.04.001

metabolic adaption, but it is important as avoid a continuous or sudden large decrease in body temperature (Soll, 2008).

Premature infants, where the risk of cold stress is greater than term infants, can suffer a cascade of damaging effects, as severe hypothermia can cause cell damage and in the most severe circumstance lead to death. Therefore, premature infants, from the moment of birth, require more assistance controlling their temperature and heat loss when compared to the term infant.

Over decades there have been many attempts to help reduce heat loss and maintain a stable body temperature, however hypothermia (temperature $<36.5\ ^{\circ}C$) is a common finding in the preterm infant admitted to both national and international neonatal units (Laptook et al., 2007; Sodemann et al., 2008; Lyon et al., 1997; American Academy of Pediatrics and AHA, 2011). To try and combat this global problem of hypothermic newborns, the World Health Organisation (WHO) recommended, since 1997, that delivery room temperatures should be maintained at $25\ ^{\circ}C$, especially when the birth of a preterm is imminent (World Health Organisation and Dorhar, 1996).

Other strategies have developed in an attempt to manage hypothermia in preterm infants. Baum (1968) tested an aluminium lined 'silver swaddler' and found this effective for prevention of heat loss, but as the material was opaque it was found to be impractical during resuscitation. Bell et al., 1980 and LeBlanc (1991) compared effects of convectively heated incubators and radiant warmers with artificial skins and body hoods. No significant differences are found in any of these studies. Single layer gowns were also used (Hobbs et al., 1975) as was bubble wrap (Besch et al., 1971), both approaches were found to be effective in preventing heat loss, but only in healthy full-term infants. These enquiries were the catalyst for numerous other methods to help improve NICU admission temperatures in the preterm and term infant.

The use of the plastic wrap or bag is one successful method that is currently utilized to minimise heat loss in the preterm infant soon after birth; since the early 1990's (Vohra et al., 1999, 2004; Knobel et al., 2005; Simon et al., 2010; Bosch et al., 1996; Duman et al., 2006; Rohana et al., 2011), all studies demonstrated the application of the plastic wrap or bag soon after birth helped minimise heat loss. It is acknowledged that existing national and international guidelines of the Australian and United Kingdom resuscitation council recommend the use of the plastic wrap/bag in the delivery room and theatre of all infants born at or less than 28 weeks' gestation.

Another method that has to be taken into consideration when exploring mechanisms of heat loss is the mode of transport used to transfer infants to the neonatal unit. Would mode of transport, add to the problems already experienced by the premature infant and further decrease heat loss on the way to the unit?

Type and method of temperature taking are also a central consideration in neonatal care. The importance of accurate temperature measurement is a crucial clinical consideration. Because hypothermia/hyperthermia can have harmful effects on the newborn infant, the clinician must have confidence in the accuracy of the device and the method used to measure temperature.

There are many issues and factors we as clinicians need to consider when preventing hypothermia. This survey will help identify if neonatal units are practicing the same methods and if not where are we doing differently?

An email and postal survey of neonatal units across Australia, New Zealand, United Kingdom and Ireland were conducted to investigate current trends and practices in the prevention of hypothermia in the preterm and term infant.

Method

Institutional review for Ethical approval was granted by the Townsville Hospital and Health Service, Human Research Ethics Committee.

The survey was developed using a web based survey design tool (www.surveymonkey.net).

There are two parts to this survey. The first part was sent by email (United Kingdom, Scotland, Southern Ireland, Australia and New Zealand) and consisted of 45 open and closed questions (see Tables 1 and 2).

Table 1 Response rates.

Email response — Europe/Australia/New Zealand	Postal response — Australia/New Zealand
226 sent by email	97 posted
48 replied (21.2%)	94 replied (97%)
8 replied from Australia and NZ	3 no response (3%)
40 replied from Europe	
7 opted out (3%)	
4 emails bounced (1.7%)	

Please cite this article in press as: Smith, J., Current practices on prevention of hypothermia and temperature taking in the preterm and term infant: A survey, Journal of Neonatal Nursing (2016), http://dx.doi.org/10.1016/j.jnn.2016.04.001