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In neonates in health care facilities, are plastic wraps used after birth more effective than conventional care with blankets in preventing hypothermia?

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Background: Hypothermia is a major cause of neonatal mortality, accounting for 18-42% of annual global neonatal death. This can be linked to higher body surface area to body mass ratio of infants causing decreased ability to insulate body heat. Conventional methods to prevent neonatal hypothermia in the hospital includes blanket bundling. The purpose of this analysis was to evaluate the effectiveness of plastic wraps compared to standard blankets in preventing neonatal hypothermia after birth.

Methods: The PubMed, Ovid (Medline), and Research Gate databases were used to begin research into the clinical question. Online filters set when searching articles included; full text available, English language, and infant/newborn subjects. Terms used in search included "Body temperature", "Infant", "Delivery", "Neonatal", "Thermoregulation", "Hypothermia", and/or "Polyethylene". Research articles with titles pertinent to the clinical question were initially collected, reviewed in detail, and then selectively omitted if inapplicable to the research question. Studies omitted include; meta-analysis designs, systematic review designs, or studies whose comparison did not match the clinical question (i.e. comparing neonates with plastic wrap technique vs neonates without any warming technique or comparing two different plastic materials). Seventeen articles were initially selected based on search criteria, and ten were ultimately chosen based on relevant content.

Results: A meta-analysis using Biostat 2.0 software was conducted on 9 of the 10 reviewed studies using intervention and control mean and P values. The article by Smith, J. 2013 was excluded due to a lack of available study metrics required for analysis. The results of the meta-analysis revealed a mean body temperature of +0.533 C in the plastic wrap intervention group, with a 95% CI 0.410-0.657; P=<.001. All included studies showed subjects' body temperature remained higher when cared for using plastic wraps and, when assessed, required less aggressive radiant and thermal warming. Additional metrics observed within the reviewed studies showed subjects who were wrapped in plastic had a higher NICU admission temperatures, required less aggressive resuscitative efforts, and had lower mortality rates.

Conclusion: Although conventional methods to prevent neonatal hypothermia focus on blanket bundling, the results of this meta-analysis reveal adequate evidence showing the superiority of plastic wrap intervention in increasing and/or maintaining higher body temperatures in neonates. By maintaining these higher body temperatures, this suggests plastic wraps play a key role in also reducing the rates of neonatal hypothermia. In addition, because the onset of hypothermia is a major cause of neonatal mortality, one should also expect mortality rates to decline. Incorporating the use of plastic wraps into thermoregulation guidelines across health care facilities should be considered as part of standard of care. However, further research may need to be conducted to determine a precise protocol that would provide the most overall benefit.

Biography

Nikole Gase is working as a Research Scholar from University of Texas Medical Branch. Her research experience includes various programs, contributions and participation in different countries for diverse fields of study. Her research interests as a Research Scholar reflect in his/her wide range of publications in various national and international journals.

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