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Clinical Response

Heel Warmers

The Clinical Services Team has created this document to answer a clinical question regarding safe alternatives to chemical heel warmers in lieu of supply disruption.

Device

Chemical heel warmers are utilized to warm an infant's heel before a capillary blood draw. This procedure used to increase vasodilation is thought to decrease squeezing pressure to the heel, discomfort for the infant, and provide a more rapid procedure completion.

Clinical Practice Guidelines

The World Health Organization (WHO) provided a best practice document for phlebotomy with information to consider in conservation efforts.[1] Due to the lower total volume and a higher likelihood of contamination, capillary specimen blood is only suitable for a limited number of tests. To ensure the tests performed are ideal for this type of blood draw, collect tests in the following order: hematology, chemistry, then blood bank specimens. Finger prick versus heel prick will depend on the child's age and weight, with the choice of heel-prick recommended for infants less than six months old or from 3–10kg in weight. WHO guidance states keeping the child warm by removing as few clothes as possible and swaddling the infant in a blanket. A caregiver should secure the child with only the extremity of the capillary sampling site exposed. Warming the puncture area with warm cloths to help dilate the blood vessels is recommended, but no specific method is provided for warming.[1]

A 2013 guidance document published by the American Association of Clinical Chemistry (AACC) listed burning the baby's skin while heel warming as a potential risk of heel sticks.[2] The author reported that while warming is commonly performed to increase blood flow, the protocol is not based on solid evidence, and she recommended further studies.[2]

Clinical Evidence

The application of local heat to the heel prior to capillary blood draw has limited studies to date with conflicting results. Studies earlier than 2002, or those with a small sample size (n<100), were not included in this review.

- A quasi-experimental study was performed on 120 healthy newborns undergoing lancing for phenylketonuria and hypothyroidism screening.[3] No treatment was applied to the first study group (n=60), and heat was applied before heel lancing in the second group (n=60). In this study, heat was applied using a deaerated thermophore (hot-water bottle) filled 2/3 full with water at a temperature of 35–38°C. The heat was applied for 10 minutes prior to heel lancing. The researchers concluded that the application of heat resulted in increased circulation, which facilitated the heel prick and shortened the duration of procedure-related pain and crying. Additionally, the study results demonstrated that repetition of the heel prick procedure was less in the study group.[3]
- In a 2002 randomized control trial, 100 preterm and term infants requiring capillary blood sampling for a complete blood count were studied for differences in pre-sample heat (n=50) vs. no heat (n=50).[4] Researchers used a chemical heel-warmer pack for 5 minutes before an automated heel-stick. According to the study, there was no difference in blood volume, collection time, crying time, or repeat procedures between the experimental and control groups. The infants who received warming of the heel experienced more squeezing during the procedure at a statistically significant rate.[4]

Standard Operating Procedure

A review of standard operating procedures (SOPs) from various institutions shows differing approaches to heel warming in specimen collection via heel stick. Below are excerpts directly from some institutions and state departments of health.

- Warm the heel for at least 3 minutes prior to puncture using "heel warmers" or a moist warm washcloth.[5]
- Warm the heel from which blood is to be obtained. A commercial heel warmer may be used.[6]
- Whole Blood Specimen-Neonates: Heel should be warmed (not to exceed 42° C: Not to exceed a depth of 2.0mm) to enhance blood flow for the skin puncture.[7]
- Warm site with a soft cloth, moistened with warm water up to 41° C, for three to five minutes.[8]
- Warm the heel with a warm damp cloth or commercially available heel warmer and position the leg lower than the heart to increase venous pressure before collecting the blood spots.[9]

Considerations:

The following are considerations for conserving chemical heel warmers during supply disruption:

- Collect and consolidate all products to a central location to ensure appropriate use and distribution.
- Ensure all clinicians performing this procedure are fully trained. Consider holding off on new training to avoid multiple sticks and excessive use of supplies.
- Review guidelines for appropriate patient selection and test in capillary sampling.
- Review facility SOP and update using current information regarding heel warming based on evidence and guidelines.
- The Clinical Laboratory Standards Institute offers a guidance document titled Collection of Capillary Blood Specimens. Organizations should review this document before initiating any updated policy or protocol for collecting diagnostic capillary blood specimens.

References

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