TITLE: Rectal versus Axillary Temperature Measurement in Newborns: Clinical Effectiveness and Guidelines

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RESEARCH QUESTIONS

1. What is the comparative accuracy of rectal versus axillary thermometers for the measurement of body temperature in newborns?

2. What is the comparative safety of rectal versus axillary thermometers for the measurement of body temperature in newborns?

3. What are the guidelines regarding the type of thermometer to measure the body temperature in newborns?

KEY MESSAGE

Limited evidence from nonrandomized studies demonstrates differences in the body temperature of newborns when measured using the axillary and rectal routes. One evidence-based guideline recommends that axillary temperature be taken with an electronic thermometer in infants under the age of four weeks.

METHODS

A limited literature search was conducted on key health technology assessment resources, including PubMed, EBSCO CINAHL, the Cochrane Library (Issue 11, 2010), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between January 1, 2000 and November 26, 2010. No filters were applied to limit the retrieval by study type. Internet links were provided, where available.
The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS

Rapid response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Six relevant non-randomized studies were identified regarding the comparative accuracy and safety of rectal versus axillary thermometers for the measurement of body temperature in newborns. One evidence-based guideline regarding the type of thermometer to use when measuring body temperature in newborns was identified. No relevant health technology assessments were identified.

OVERALL SUMMARY OF FINDINGS

Six non-randomized studies\(^1\)\(^-\)\(^6\) included comparisons between axillary and rectal temperatures in newborns. Statistically significant differences in temperature were observed between axillary and rectal readings.\(^1\)\(^,\)\(^2\)\(^,\)\(^5\) The study authors concluded that axillary and rectal readings cannot be used interchangeably\(^1\)\(^,\)\(^2\) and that forehead, digital axillary and tympanic thermometers were not suitable replacements for glass mercury thermometers.\(^5\) When optimally placed, axillary and rectal temperature readings with glass thermometers were determined to be equivalent in one study\(^4\) and there was good correlation between rectal and axillary temperatures in two studies.\(^3\)\(^,\)\(^6\) The authors of one study\(^3\) suggest use of axillary thermometers instead of rectal thermometers for neonates because they are potentially less hazardous. There were conflicting results regarding the use of electronic or digital thermometers instead of glass mercury thermometers. One study\(^6\) supported the use of other digital or electric thermometers in their place, while a second study concluded other thermometers are not suitable replacements for glass mercury thermometers.\(^5\)

The identified guideline\(^7\) recommends oral and rectal routes of temperature measurement not be used routinely for children under the age of five years. Under the age of four weeks, the guideline recommends axillary temperature be taken with an electronic thermometer.
REFERENCES SUMMARIZED

Health technology assessments
No literature identified.

Systematic reviews and meta-analyses
No literature identified.

Randomized controlled trials
No literature identified.

Non-randomized studies


Guidelines and recommendations


See: 1.1.1 Oral and rectal temperature measurements and 1.1.2 Measurement of body temperature at other sites, page 9

APPENDIX – FURTHER INFORMATION:

Position statements


Systematic reviews – newborns not specified


Non-randomized studies – newborns not specified