Thermoregulation of Preterm Neonates During and After Skin-to-Skin Care

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Background and Aim: Avoiding variations in body temperature is an important issue in daily care of preterm neonates. Using infrared thermography (IRT), we recently found a drop in skin temperature of premature babies after they were re-positioned from Skin-to-Skin Care (SSC) back to the incubator [6]. Since this did not disappear within 10 minutes, we wanted to find out how long it takes until the baby has fully warmed-up after SSC and whether the IRT measurements correlate with conventional rectal temperatures.

Patients and Methods: Prospective observational study on 5 pre-term neonates (3 male), gestational age 28 (25–29) weeks, current age 34 (28–52) days, current weight 1263 (790–1465) grams. All babies were spontaneously breathing on CPAP or high-flow cannula.

Temperature distribution was determined by IRT (VarioCam hr-Head thermal camera, InfraTec GmbH, Dresden, Germany) in five skin areas: leg (L), back (B), arm (A), head (H), and upper abdomen (UA), and compared with conventional temperature sensors (TS) in back (TSB), upper abdominal (TSUA) and rectal position (Fig. 1).

Temperatures were read every two minutes and displayed for four time points, namely, at the beginning and at the end of Skin-to-Skin care (SSC 1, SSC 2), as well as at the beginning and at the end of a subsequent 60 mins incubator period (Ibeginning – Iend).

Results and Discussion: During SSC, a slight but significant increase in mean surface temperature by 0.5 °C occurred. Positioning the baby back to the incubator caused a sudden drop in skin temperature by 1.0 °C which was not compensated for during a subsequent 60 mins incubator phase. In contrast, head temperatures remained constant both during and after Skin-to-Skin Care, in accordance with rectal temperatures (Fig. 2). The decreasing peripheral at constant central temperatures might reflect a thermoregulatory response (peripheral vasoconstriction) after SSC which, in itself, seems to result in a homogeneous warming (peripheral vasodilation) of preterm neonates [5, 6].

Conclusion: Whereas Skin-to-Skin Care seems to provide full thermal comfort, attention has to be paid to the post-SSC incubator phase which might be an unexpected thermal challenge for preterm neonates.

Fig. 1 Thermographic measurement of skin temperature distribution in a preterm neonate during Skin-to-Skin Care (SSC).

Fig. 2 Box plot of average skin (IRT: All Areas), head (IRT: Head), upper abdominal (Temperature sensor), and rectal (dashed line) temperatures at the time points SSC 1 (immediately after incubator care), SSC 2 (end of kangarooing), and Ibeginning – Iend (start and stop of the subsequent 60 mins incubator period).

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