Background and aims Disturbed cerebral oxygenation during the neonatal period might pose preterm infants at risk for neurological deficits. Our aim was to determine whether regional cerebral tissue oxygen saturation (rSO2) and fractional tissue oxygen extraction (FTOE), measured by near-infrared spectroscopy, were associated with neurodevelopmental outcome of preterm infants at 2–3 years of age.

Methods We included 83 preterm infants (gestational age < 32 weeks) and measured rSO2, and calculated FTOE on days 1, 2, 3, 4, 5, 8, and 15 after birth: (tcSO2−rSO2)/tcSO2. Additionally, we determined the area under the curve (AUC) of rSO2 and FTOE during the first 2 weeks. Cognitive, motor, neurological and behavioural outcome was determined at 2–3 years of age. Multiple linear regression analyses were used to determine whether rSO2 and FTOE contributed to outcome.

Results We included 67 infants for follow-up. Lower quartile (P25–50) and highest quartile (P 75–100) of r cSO2 values on day 1 were associated with poorer fine motor outcome (p = 0.002) and cognitive outcome (p = 0.004). The amount of time rSO2 < 50% on day 1 was negatively associated with gross motor outcome (p = 0.002). The highest quartile of FTOE values on day 1 was associated with poorer total motor outcome (p = 0.014). Lower quartile (P 25–50) AUC of rSO2 was associated with poorer cognitive outcome (p = 0.014). Lower quartile (P25–50) and highest quartile (P 75–100) of r cSO2 values on day 1 were associated with poorer total motor outcome (p = 0.041).

Conclusions Neurodevelopmental outcome at 2–3 years of age was associated with cerebral oxygen saturation during the first 2 weeks after birth in preterm infants. Both high and low rSO2 values had a negative influence on neurodevelopmental outcome.

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Objective Pain is a multi-dimensional and complex experience which influences all people physically, emotionally and socially. The process of care and pain relief is the duty of nurses. Today, pain is assessing as the fifth human vital signs. Therefore, the standards of nursing care should be prioritized. The objective of this study was to assess the efficacy of kangaroo care (KC) on pain severity during the heel stick in premature infants.

Material and method In this interventional study, a total of 20 premature infants recruited during 4 months were enrolled in this study. The inclusion criteria were premature infants with gestational age 27–36 weeks and aged 3–28 days, stable respiratory status. In need of heel stick and Appgar score more than 6 at 5 minutes. In this randomized interventional study the blood is taken from each infant once by using KC and another time by incubator care (IC). In each method, PIPP was used to evaluate the severity of pain. Data were analyzed using by SPSS for Windows. Paired sample t-test was used for data analysis.

Findings The severity of pain as the result of heel stick is different in 2 methods. The mean pain score in the KC method was 4.9±2.92 vs IC 11±4.22 and that is, significantly lower than the (IC) (P<0.001).

Conclusion KC that starting 30 minutes before and continuing 10 minutes after heel stick was found to be effective in decreasing pain before and after heel stick in premature infants.