“Evaluation of the active warming effects on maternal and neonatal outcomes during cesarean delivery”

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Introduction

According to the Curley’s definition the normothermia corresponds to a core temperature between 36,6°C ± 0,38°C. Mild hypothermia can cause cardiovascular, hematological, metabolic and hormonal alterations.

Maternal hypothermia is common during cesarean delivery and it can exercise influence over neonatal temperature, umbilical acidosis and lower Apgar score at birth.

A prospective randomized trial of healthy term parturients undergoing cesarean delivery was designed to assess the incidence of hypothermia and the impact of active warming on maternal and neonatal outcomes.

Materials and Methods

Sixty-seven healthy women undergoing cesarean delivery with spinal anesthesia were randomly assigned to receive either warmed IV fluid and lower body forced-air warmer (AW) or no warming, IV fluid infused at environmental temperature (NW).

A forehead zero-heat-flux sensor was used to measure core temperature at baseline and every ten minutes intraoperatively until the operating room exit. Neonatal axillary temperature was also measured.

Perioperative shivering (Bedside Shivering Assessment Scale: 0-3), thermal comfort scores (TCS: 0- 100 scale), Apgar scores, and umbilical cord blood gas analysis were recorded.

Temperature changes with and without warming after neuraxial block for cesarean delivery

Results and Discussion

The baseline data were similar between the two groups. The AW group (32 patients) had a higher temperature compared with the NW group (35 patients) at the operating room exit (36,7°C ± 0,32°C vs 36,28°C ± 0,35°C; p< 0,001). In four NW patients the temperature significantly decreased from 30 minutes after neuraxial anesthesia until the operating room exit (30 min vs baseline: 35,62°C ± 0,20°C vs 36,75°C ± 0,13°C; p< 0,001). These patients experienced also shivering (2 score). The TCS was higher in AW vs NW group during the study period (at 30 min: p< 0,001).

Neonatal hypothermia was observed in twenty (57%) newborns of the NW group. The Apgar scores and the umbilical cord blood gas analysis were similar between groups.

Conclusions

The Active warming utilizing combined IV fluid and forced-air warming is effective in decreasing the incidence of maternal and neonatal hypothermia as well as maternal shivering during cesarean delivery.

Therefore the maternal comfort and the neonatal outcome are improved.

Demographic and Obstetric Data of the Study Population

	Active Warming (N= 32)	No active warming (N= 35)
Age (y)	33± 5	32± 6
BMI (kg/m²)	28,85± 4,87	27,75± 3,63
Gestational age (wk)	38,19± 1,46	38,3± 1,36
Parity	2 (1-2)	2 (1-2)
Previous cesarean delivery	18	27
OR Temperature (°C)	22,975± 0,010	23,54± 0,08
Intraoperative crystalloid (mL)	1143,75± 330,87	962,90± 348,83
Estimated blood loss (mL)	212,5± 80,32	243,54± 91,55

Babies’ Data

Variable	Active Warming	No active warming
Initial axillary temperature (°C)	36,62± 0,28	36,1± 0,50
Axillary temperature at 5 min (°C)	36,64± 0,33	36± 0,34
Umbilical vein pH	7,33± 0,06	7,34± 0,08
Apgar at 1 min	8,15± 0,37	8± 0,55
Apgar at 5 min	9,03± 0,20	8,9± 0,29
Cases of Hypothermia	0	20