Effect of oronasopharyngeal suction on arterial oxygen saturation in normal, term infants delivered vaginally: A prospective randomised controlled trial

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Summary

Oronasopharyngeal suction (ONPS) with a suction bulb at birth is a traditional practice in the initial management of healthy infants in Iran and many other countries. The purpose of this study was to compare the effects of oronasopharyngeal suction (ONPS) with those of no suction in normal, term newborns delivered vaginally. A total of 170 healthy term infants of first and single uncomplicated pregnancies, with clear amniotic fluid, vaginal delivery and cephalic presentation, enrolled in the trial during labour. Newborns were randomised into one of the two groups, according to the use of the ONPS procedure. Arterial oxygen saturation (SaO₂) levels, heart rates, blood gases of umbilical cord and Apgar scores were determined. The mean SaO₂ values over the 1st and 5th min of birth were similar in the two groups. The maximum time to reach SaO₂ 2 of ≥92% was shorter in the no suction group. There were no statistically significant differences in the mean of heart rates, respiratory rates and Apgar scores between the groups. Apgar scores at 5 and 10 min were between 8 and 10 for all infants, respectively. Newborns receiving suction showed a statistically significant, lower mean partial carbon dioxide pressure (PCO₂) and a significantly higher partial oxygen pressure (PO₂) of umbilical artery. Although findings remained on the statistical level, these were not considered clinically significant because values remained within normal ranges. According to this study, ONPS is not recommended as a routine procedure in normal, term infants delivered vaginally.

Material and methods

The Ethics Committee at Afzalipoor Hospital, Kerman, Iran approved this study to assess the merits of ONPS in term infants delivered vaginally. Informed consent was obtained from mothers before enrolment. In the previous study by Gungor et al. (2006), the sample size was 140. Our study sample size was calculated based on the calculation performed by Gungor et al. (2006) and %15 was added to that value for drop out cases. By this method, the sample size was calculated to be 170. All infants were enrolled in the study. After exclusion of those with maternal or fetal pathological changes, medication before or during labour and evidence of fetal distress, 170 healthy term newborns of first and single pregnancies with clear amniotic fluid and vaginal delivery in the cephalic presentation, were selected for the study during labour. Newborns were randomized to either the ONPS group or the no suction group. In the suctioned group, this was performed immediately (<15 s) after birth by using a sterile polyethylene tube, and negative pressure did not surpass 30 cm H₂O. In the no suction group, the intervention was only to remove any visible material. pH, partial carbon dioxide pressure (PCO₂) and partial oxygen pressure (PO₂) were determined in umbilical arterial samples. After aspiration, the newborns were separated into the two groups, were left under radiant heat and received standard care. A saturation sensor was attached to the middle finger of the right hand of the newborn, in order to monitor arterial oxygen saturation (SaO₂) and heart rate. Saturation measurements were evaluated only when the heart rate did not differ more than five beats from that obtained by the pulseoximeter. The first reading was determined at the 1st min of birth, until a SaO₂ level of ≥92% was reached. Apgar scores were reported at 1 and 5 min following delivery. All newborns were followed until the 3rd day of life and when the results of the physical and neurological

Results

A total of 170 neonates completed the study (n = 85 per group). All newborns were in good clinical condition and did not need any supplement oxygen. There was no significant difference in characteristics, including gestational age, birth weight, sex, heart rate and respiratory rate in the two groups (Table I). Although the values of all newborns in both groups were in the normal range, the mean PO₂ of the umbilical artery was lower in the no suction group, while the mean PCO₂ of umbilical artery was higher (p <0.05). No difference was found in the pH in the two groups. The primary end-point of the study was timed to reach 92% SaO₂. While the slowest newborn in the no suction group achieved an SaO₂ of 92% at 9 min of life, it took 11 min for the slowest one in the suction group (p = 0.002) (Table II). None of the neonates in ONPS group achieved 92% before 8 min of life. The number of infants in at 10 min who had yet to reach that threshold, was eight in the suction and no suction group. The secondary outcome variable was the Apgar scores. Apgar scores of all newborns were 8 or 9 at 1 min of life. The mean was 8.96±0.19 in ONPS group and 8.99±0.11 in the no suction group during the 1st min of life (p = 0.3). All neonates had a score of 10 at 5 min.