

To Evaluate the Effect of Nuchal Cord on Perinatal Outcome

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ABSTRACT

Background and objectives: Nuchal cord is one of the possible causes of asphyxia. 'Asphyxia' is defined as the combination of lack of oxygen and acidosis with impaired organ function. There is accumulation of lactate in the vascular beds with limited oxygen supply due to anaerobic glycolysis leading to gradual development of the metabolic acidosis. So lactate concentration of cord blood is considered as possible predictive variables for fetal hypoxia. Hence the present study was undertaken to observe the effect of nuchal cord on the status of neonates.

Aims and Objectives: To study the perinatal outcome in cases of nuchal cord

Methodology: 80 consecutive women found with nuchal cord at the time of vaginal delivery were taken along with 80 consecutive women with no nuchal cord at the time of vaginal delivery. Lactate concentration in the cord blood was analysed in both groups and compared.

Results: Lactate levels in our study ranged from a minimum value of 1.01 mmol/l to maximum 6.46 mmol/l. The values varied between 1.01-6.46 mmol/l in group I and 1.01-4.39 mmol/l in group II. In the present study 71 (88.75%) patients who had umbilical artery blood lactate levels ≤ 2.22 mmol/l and 9 (11.25%) had > 2.22 mmol/l in group I and 78 (97.50%) patients had ≤ 2.22 mmol/l and 2 (2.50%) had > 2.22 mmol/l lactate levels in group II. On statistical analysis, the difference among both the groups was significant ($p < 0.05$ Significant).

Conclusion: On statistical analysis, the difference among both the groups was found to be significant ($p < 0.01$). Higher levels of neonatal cord blood lactate in nuchal cord group in the present study suggests it to be a strong indicator of intrapartum asphyxia

INTRODUCTION

- Umbilical cord is called as the lifeline of the fetus. "The term nuchal cord (Cord Around the Neck – CAN) describes an umbilical cord that passes 360 degrees around the fetal neck."¹
- About 28% of all pregnancies have nuchal cord
- Nuchal cord is one of the possible causes of asphyxia. The World Health Organization (WHO) estimates for global neonatal deaths caused by birth asphyxia is 29%.^{9,10}
- Many obstetricians prefer to perform elective cesarean section if antenatal diagnosis of nuchal cord has been made by sonography just to avoid strict fetal monitoring in these cases.
- However, the aim of safe ante natal care is to avoid unnecessary cesarean section. Thus it is mandatory to evaluate the effect of nuchal cord on perinatal outcome.
- Various methods that have been used to diagnose fetal hypoxia include clinical observations like Apgar score, cord blood biochemical analysis and lactate levels.
- As umbilical arterial pH may reflect not only fetal hypoxia and anaerobic metabolism but also maternal respiratory state. So lactate concentration of cord blood is considered as possible predictive variables for fetal hypoxia in comparison with pH, alone or in combination with the Apgar scores.⁴³
- Measuring the umbilical artery lactate level is regarded as an efficient and accurate technique for the diagnosis of fetal distress.^{44,45}

AIM AND OBJECTIVES

- To study the perinatal outcome in cases of nuchal cord.

MATERIAL AND METHODS

- The prospective study was carried out in the Department of Obstetrics and Gynecology in Pt. B.D. Sharma PGIMS, Rohtak,
- A total of 160 patients with singleton pregnancy (37-41 weeks) with vertex presentation were included in the study.
- Pregnant women under study were divided in two groups
- Group I- This comprised of 80 consecutive women found with nuchal cord at the time of vaginal delivery
- Group II- This comprised of 80 consecutive women found with no nuchal cord at the time of vaginal delivery.
- Collected data was compiled and statistical evaluation was carried out by using SPSS 20 version.
- Group mean comparison was tested for significance by student's t test.

RESULTS

- The reference range of lactate in plasma was 0.5-2.22 mmol/L or 4.5-20mg/dl.
- In the present study 9(11.25%) had >2.22 mmol/l in group I and 2 (2.50%) had >2.22 mmol/l lactate levels in group II. On statistical analysis, the difference among both the groups was significant ($p < 0.05$ Significant).
- In cases (nuchal cord group) in terms of mean (mean $\pm$ SE) pH was 7.20 ± 0.04 and results in controls (non-nuchal cord group) in terms of mean (mean $\pm$ SE) pH was 7.23 ± 0.01 . The differences in umbilical arterial pH was statistically significant.
- The difference in Apgar score of babies at 1 min (p value > 0.05) and 5 minutes (p value > 0.05) of birth was not statistically significant between two groups.

Distribution of cases according to umbilical artery blood lactate levels

Lactate levels (mmol/l)	Group I (n=80) Cases	Group II (n=80) Control
≤ 2.22	71(88.75%)	78(97.50%)
> 2.22	9(11.25%)	2(2.50%)
Mean $\pm$ SD	2.02 ± 1.14	1.61 ± 0.54
Range	1.01-6.46	1.01-4.39

$P < 0.01$ significant using Chi-square test and 95% CI -0.59 to -0.11 using mean comparison

Umbilical artery pH levels amongst two groups

pH	Group I (n=80) Cases	Group II (n=80) Control
Mean $\pm$ SD	7.20 ± 0.04	7.23 ± 0.01
Range	6.98-7.23	7.20-7.24

$p < 0.01$ Sig. using Unpaired t-test

Distribution of cases according to apgar score at 1 min / 5 mins

Apgar score (1 min)	Group I (n=80) Cases	Group II (n=80) Control	Statistical significance
≤ 3	1(1.25%)	0	$p = 0.315$ NS
4-6	5(6.25%)	4(5%)	$p = 1$ NS
≥ 7	75(%)	76(%)	$p = 0.731$ NS
Apgar score (5 mins)			
≤ 3	0	0	-
4-6	3(3.75%)	0	$p = 0.08$ NS
≥ 7	77(96.25%)	80(100%)	$p = 0.08$ NS

CONCLUSIONS

- It was concluded that umbilical cord lactate levels and blood gas results are significantly affected by nuchal cord resulting in acidosis of baby born with nuchal cord but the Apgar score is not affected.

- A more prolonged period of deterioration is required before an acidotic baby needs resuscitation which does not occur in babies delivered vaginally with nuchal cord resulting in overall unaffected neonatal outcome.
- Hence, vaginal delivery appears to be a safe mode of delivery in patients with nuchal cord.
- Nuchal cord diagnosed sonographically should not be taken as an indication of elective caesarean section.

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