

Nuchal Cord and Perinatal Outcome

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ABSTRACT

Aims: To establish the incidence of nuchal cord at the time of delivery and to assess its impact on the intrapartum and perinatal outcome.

Materials and methods: This was a cross-sectional study conducted at KLES Dr Prabhakar Kore Hospital and Medical Research Centre, Belgaum, India, from January 2011 to March 2011. A sample size of 429 was calculated. Informed consent was obtained and eligible women were enrolled. The babies born with a cord around the neck were compared to those without. The particulars noted were age, BMI, parity, loops of cord around the neck (single or multiple), type of loop, mode of delivery, weight of the baby and Apgar score at birth and 5 minutes. The parameters were then compared and statistically analyzed using Chi-square test.

Results: Incidence of nuchal cord at the time of delivery was 13.75%, of which single nuchal cord was highest (76.66%). The study revealed that age, BMI (in kg/m²), parity, gestational age and birth weight were not statistically significant to the presence of nuchal cord. Though instrumental deliveries were more in babies with nuchal cord, it was not statistically significant ($p = 0.932$). Apgar score < 7 at 1 minute was significantly low in nuchal cord group and Apgar score at 5 minutes and admission to neonatal unit was equivalent to those babies born without nuchal cord ($p = 0.947$).

Conclusion: Nuchal cord is not associated with adverse perinatal outcome.

Keywords: Nuchal cord, Fetal heart rate irregularities, Meconium, Instrumental delivery, Cesarean section, Apgar score.

How to cite this article: Shereen K, Patil K, Swamy MK. Nuchal Cord and Perinatal Outcome. *J South Asian Feder Obst Gynae* 2015;7(1):15-17.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Since ages, the management of nuchal cord has remained an enigma to obstetricians. Several studies have analyzed deliveries with nuchal cord with differing results.¹⁻⁵

Nuchal cords have generally been considered to be rather nonthreatening.^{3,5} Nevertheless, in the beam of nonreassuring fetal heart rate patterns during labor and increased umbilical artery acidemia in nuchal cord, together with evidence of fetal malperfusion as reflected by decreased birth weight, the question needs to be raised of whether the presence of nuchal cord at admission for delivery has to be followed expectantly or if active planning of delivery strategies in term pregnancies with nuchal cord is reasonable.^{6,7}

Management practices have been controversial as some obstetricians prefer to deliver these babies by elective cesarean section and others by vaginal route. When detected antenatally by ultrasound, it has all the more biased obstetricians to deliver these babies by cesarean. Furthermore, the fear of neonatal complications favors operative interventions.

Hence, considering the above facts, the present study was taken up to establish the incidence of nuchal cord at delivery in the existing setup, the intrapartum complications and the perinatal outcomes in babies born with nuchal cord.

MATERIALS AND METHODS

This was a cross-sectional study conducted at KLES Dr Prabhakar Kore Hospital and Medical Research Centre, Belgaum, during the period of January 2011 to March 2011. Ethical clearance was obtained from Institutional Ethics Committee of Jawaharlal Nehru Medical College, Belgaum. A sample size of 429 was calculated statistically. The women with singleton pregnancies with gestational age more than 28 weeks, and those with an umbilical cord forming a loop around the neck of the baby at delivery were included. Multiple gestations were excluded. Written informed consent was obtained and the eligible women were allowed to follow the course of labor and either delivered vaginally or by cesarean section (wherever indicated). At the time of birth, cord around the neck was noted. In babies with nuchal cord, the type of loop (nuchal cord was considered to be loose when

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Table 1: Incidence of nuchal cord

Nuchal cord	Number (n = 429)	Percentage
Present	59	13.75
Absent	370	86.25

Table 2: Comparison of single and multiple nuchal cord with fetal heart irregularities and meconium staining of liquor

	Single nuchal cord (n = 47)	Multiple nuchal cord (n = 12)
Fetal heart rate irregularities	8.51%	8.30%
Meconium stained liquor	8.51%	8.30%

p = 1.0000

it could be easily released before delivery of the fetal trunk and tight when it needed to be clamped and cut before delivery of the trunk) and number loops were also documented. The cases with nuchal cord at the time of delivery were taken as study group and those which did not have nuchal cord served as the comparative group.

The primary outcome noted was the incidence of nuchal cord. The secondary outcome variables noted were instrumental and cesarean section rate, meconium staining of liquor, fetal heart rate irregularities, Apgar score at 1 and 5 minutes and admission to neonatal intensive care unit (NICU). The outcome variables between the two groups were compared and statistically analysed by Chi-square test.

RESULTS

In the present study, the incidence of nuchal cord was 13.75% as shown in Table 1. Among them 47 (79.66%) had one loop, 9 (15.25%) had two loops and 3 (5.08%) had three loops. Most of them (52.54%) were tight nuchal cords and, in 47.46%, they were loose loops.

The study revealed that age, BMI (in kg/m²), parity and gestational age were not statistically significant to the presence of nuchal cord (p < 0.05).

This study noted that meconium staining of liquor was present in 5.08% of babies with nuchal cord and in 23.2% in the comparative group. The study also noted that fetal heart irregularities were seen in 8.47% of babies born with nuchal cord though only 3 of them had proven fetal distress. Similarly, 24.86% of babies born without nuchal cord had fetal heart rate irregularities of which 15 had fetal distress. Chi-square analysis showed that nuchal cord is responsible for fetal heart rate abnormalities and meconium staining of liquor, (p < 0.05), though this may not alter the mode of delivery. The study also compared the effects of single and multiple nuchal cords on these intrapartum events and revealed that it was not statistically significant as seen by the p-value (1.000) shown in Table 2.

Table 3: Mode of delivery

	Normal delivery	Instrumental	LSCS
Study group	64.41%	5.08%	30.51%
Comparative group	64.59%	4.05%	31.35%

p = 0.932

Table 4: Apgar score and NICU admission in relation to nuchal cord

Apgar score	Study group (n = 59)	Comparative group (n = 349)	p-value
<7 at 1 minute	63.79%	58.75%	0.45
<7 at 5 minutes	10.34%	10.58%	0.958
NICU admission	13.56%	13.24%	0.947

In the present study, the presence of nuchal cord did not determine the mode of delivery as shown in Table 3, (p = 0.932), which is not statistically significant. Therefore, the morbidity to the mother can be reduced by allowing patients with nuchal cord to deliver vaginally.

In this study, 95.10% (n = 408) were live births whereas 4.90% (n = 29) were stillbirths. The present study revealed that babies with nuchal cord, at term, had similar birth weights when compared to those without nuchal cord (p > 0.05), inferring that the birth weight of babies is not dependent on nuchal cord.

Apgar score less than 7 at 1 and 5 minutes and admission to NICU was not statistically significant, which concludes that the neonatal adaptability is not compromised by the presence of nuchal cord as shown in Table 4.

DISCUSSION

A study published in the American Journal of Obstetrics and Gynaecology, 1995, depicted that the incidence of nuchal cord increases from 5.8% at 20 weeks of gestation to 29% at 42 weeks.⁸ The incidence of nuchal cord in this study was 13.75% of all the deliveries after 28 weeks of gestation. The incidences are comparable in similar studies conducted where the incidence ranges between 14 and 18%.²⁻⁷

Several studies have been conducted and have analyzed the effect of nuchal cord on intrapartum events and neonatal outcome with controversial results. In this study, fetal heart irregularities were seen in 8.47% of babies born with nuchal cord though only 3 of them had proven fetal distress, and Chi-square analysis showed that nuchal cord is responsible for fetal heart rate abnormalities (p < 0.05). The present study also noted that meconium staining of liquor was present in 5.08% of cases with nuchal cord and in 23.2% in the comparative group which suggests that the presence of nuchal cord is highly associated with meconium-stained liquor (p < 0.05). A study conducted in Kathmandu University

revealed that fetal heart rate irregularities and meconium staining of liquor were less common in babies born with nuchal cord.⁹

The presence of multiple nuchal cords (2 or more loops) is estimated to affect between 2.5 and 8.3% of all deliveries.¹ In this study, the incidence of single and multiple nuchal cords (two or more entanglements) was 76.66 and 20.08% respectively. In comparison to other similar studies, this was significantly more, where the incidence has been quoted to be 18 to 29% for single loops and 3 to 5% for multiple loops.^{7,8} The increase in incidence can be attributed to the smaller sample size of the study.

It was observed that tight loops were slightly more prevalent (52.54%) than loose loops (47.54%). This is in contrast to a similar cross-sectional study where loose loops were more prevalent than tight loops, but a cause for this could not be established.⁸

In the present study, instrumental delivery rate was statistically not significant ($p = 0.729$), and these findings are in conflict with other similar studies.^{3,7-9} The cesarean section rate, however, was lower in study group but not significant ($p = 0.937$). In studies conducted by Sheiner et al and Mastrobattista et al, a significantly lower cesarean section rate was seen in those with nuchal cord.^{4,6}

Apgar score < 7 at 1 minute was not significantly more in study group ($p = 0.453$). This signifies that there is no birth asphyxia as a result of cord compression during labor. The Apgar score < 7 at 5 minutes and admission to neonatal unit was not significantly more which means primary neonatal adaptation is not impaired by nuchal cord compression. The findings are similar in comparison to other similar studies.^{8,10} However, in the study by Peregrine et al,¹¹ presence of nuchal cord did not significantly increase the risk of Apgar score < 7 at 1 minute.

CONCLUSION

- The incidence of nuchal cord in the present study was 13.75%.

- The presence of nuchal cord had no statistical significance on the mode of delivery, reducing the morbidity to the mother.
- Perinatal outcome of the babies as seen by the Apgar score and rate of NICU admission was not statistically significant.
- Nuchal cord is not associated with adverse perinatal outcome.

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