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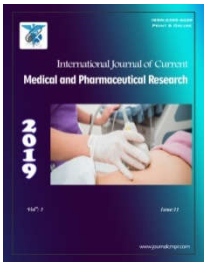

Research Article

CASE CONTROL STUDY OF MATO-FETAL OUTCOME IN CASES OF NUCHAL CORD

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ABSTRACT

Introduction: Nuchal cord is associated with higher perinatal morbidity and mortality due to variable fetal heart rate during labour.
Objectives: To study the mode of delivery and perinatal outcome in cases of nuchal cord.
Methods: This is a prospective study of 308 cases. Out of them 154 cases were diagnosed as a nuchal cord in ultrasonography, mode of delivery, and perinatal outcome was observed.
Results: In case group, vaginal delivery, caesarean section and forceps delivery were 56.49%, 42.86%, 0.65% respectively.

- In cases of nuchal cord, the major indication of LSCS was fetal distress 16.23%
- NICU admission in case group and control group were 46.10% and 11.68% respectively.
- Total perinatal deaths in case group were 13(8.44%)

Conclusion: Nuchal cord is not an indication of caesarean section but close monitoring during labour is required for better perinatal outcome.

INTRODUCTION

- Nuchal cords that form early can resolve at any time or persist until term and coil may form shortly before delivery.[1,2]
- Nuchal cord, or cord around neck of an infant at birth, is a common finding that has implications for labour, management at birth, and subsequent neonatal status.[3]
- Nuchal cords are common, with prevalence rates of 6% to 37%.[4]
- Some researchers think nuchal cord has been associated with adverse perinatal outcomes, such as fetal growth restriction, higher incidence of caesarean section, newborns with low Apgar score, even perinatal death; While others conclude nuchal cord is the part of the life of the fetus in utero, is not associated with adverse perinatal outcome, also does not increase the higher incidence of caesarean section.[5]
- The occurrence of nuchal cord entanglement is associated with increased rate of variable fetal heart rate, Deceleration during the first and second stage of labour.
- This is a case control study of feto-maternal outcome in 154 cases with nuchal cord and 154 without nuchal cord used as controls. Controls were selected randomly. All 308 patients of the study group were in active stage of labour and ultrasound was done on admission.

Aims and Objective

- To find out the maternal outcome in terms of mode of delivery, as normal or instrumental delivery or caesarean section
- To find out the effect of nuchal cord on fetus in utero.
- To study the neonatal outcome in terms of APGAR score in cases of nuchal cord and in terms of neonatal morbidity and mortality.

MATERIAL AND METHODOLOGY

- This is a case control study of maternal and fetal outcome in 154 cases with nuchal cord and 154 without nuchal cord used as controls (selected randomly), in active stage of labour and diagnosed in ultrasound after admission. The study period was from MAY 2015 to APRIL 2018.
- After admission, history and examination of the women was carried out, with consent of the patients.

Inclusion Criteria

- The study includes both primigravida and multigravida.
- Singleton pregnancies only with cephalic presentation.
- Booked cases with average four antenatal visits.
- Fetal heart rate was monitored by intermittent auscultation with stethoscope and fetal Doppler.
- All admissions were subjected to ultrasound.

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Exclusion Criteria

- Malpresentation
- Multiple gestation
- Congenital malformation of fetus

METHODOLOGY

- At the time of admission in labour room investigations and ultrasonography were carried out for fetal maturity and cord around neck.
- Numbers of loops around the fetal neck, tight coils or loose coils and APGAR score at 1 and 5 minutes were noted.
- Birth weight, length of cords, placental weight was measured and noted.
- A data check sheet was maintained for each case until completion of delivery.

OBSERVATION AND DISCUSSION

- This was a study of 308 cases for feto-maternal outcome presenting in active stage of labour and ultrasound done on admission selected randomly, with or without nuchal cord.
- Mean age was 24 years in this study.
- In case group, primigravida and multigravida were 47.4% and 52.6% respectively. In control group, primigravida and multigravida were 41.83% and 58.44% respectively.

Table no 1 Fetal heart rate variation

	Cases		Control	
Heart variation	No.	%	No.	%
Total cases	70	45.45	18	11.68
1.Bradycardia	21	13.66	0	-
2.Variable	14	9.09	7	4.54
3.Early deceleration	9	5.84	7	4.54
4.Late deceleration	9	5.84	4	2.59
5.Tachycardia	8	5.19	0	-

- Table no. 1 shows that total number of cases of heart rate variations in this study in case group were 70(45.45%) and in control group were 18(11.68%).
- Major variations in fetal heart rate seen in case group were bradycardia (13.66%) and variable heart rate pattern (9.09%).
- Fetal heart rate variation was seen in 45.45% cases in case group.

Table no 2 Mode of delivery

	Cases(n-154)		Control(n-154)		P value
Mode	No.	percentage	No.	Percentage	
Normal delivery	87	56.49	123	79.87	<0.0001
Caesarean section	66	42.86	31	20.13	<0.0001
Forceps	1	0.65	0	-	-

- Table no.2 shows that vaginal delivery was noted in 56.49%, caesarean section in 42.86% and forceps delivery in just one case in the case group, vaginal delivery was in 79.87% and caesarean section in 20.13%.
- P value is <0.0001 which means the difference is statistically significant.

Table no 3 Indication of LSCS in study group

	Cases		Control	
Indication	**No.(66/154)**	**Percentage (42.86/100)**	**No. (31/154)**	**Percentage (20.13/100)**
Fetal distress	25	16.23	0	-
meconium stained liquor	15	9.74	6	3.89
Non progress of labour	12	7.79	2	1.29
Pre-CS	5	3.24	10	6.49
Post date	4	2.59	2	1.29
CPD	3	1.95	8	5.19
IUGR	1	0.64	2	1.29
Preeclampsia	1	0.64	1	0.64

- Table no. 3 shows that majority of the indications of LSCS were fetal distress, meconium stained liquor, NPOL in case of nuchal cord. In control group, the most common indication was previous CS.
- Fetal distress was the most common reason for LSCS, which simulates the other studies.

Table no 4 Apgar score

APGAR Score		Case		Control	
		No.	**%**	**No.**	**%**
At 1 min	<7	83	53.89	24	15.58
	>7	62	40.25	130	84.5
	0	9	5.84	0	-
At 5 min	<7	71	46.1	18	11.68
	>7	74	48.1	136	88.31

Table no. 4 shows that, P value is <0.0001 which means the difference is statistically significant.

- In case group, Apgar score <7/10 at 1 min and at 5 min in neonates were 53.89% and 46.11% respectively. In control group, APGAR <7/10 at 1 min and at 5 min in neonates were 15.58% and 11.68% respectively. This indicates nuchal cord affects APGAR score of child at birth.
- There were 46% cases of APGAR <7/10 at 5 minutes in this study, of which most of them were admitted mainly for post resuscitation care and severely affected babies were admitted for birth asphyxia and MAS which prolonged NICU admissions.
- All IUD were present in case group only and were delivered vaginally.

Table no 5 Cord Loops

No. of loops	Loose loop		Tight loop	
	No.	**%**	**No.**	**%**
1 loop	64	41.55	49	31.81
2loops	15	9.72	11	7.14
3loops	9	5.84	5	3.26
4loops	1	0.64	0	0
Total	89	57.79	65	42.21

Table no. 5 shows that loose loop of nuchal cord were 57.79% and tight loop were 42.21%.

Table no 6 NICU Admissions:

Days of admission	Case	Control
1 day	25	12
2 days	19	6
≥3 days	27	0
Total	71	18

- Table no. 6 shows that, P value is <0.0001 which means the difference is statistically significant.
- NICU admissions in case group was seen in 46.10% as compared to control group (11.68%)
- The neonates who got admitted in NICU were those who had low APGAR score at 1 min and 5 min due to asphyxia and meconium aspiration syndrome, probably by strangulating loop of nuchal cord.
- NICU admissions were seen higher in cases of tight loop of nuchal cord than loose loop.
- In tight loop cases, there was more fetal compromise which lead to NICU admissions, 60.56% whereas in loose loop, NICU admissions were 39.44%.
- Total no. of perinatal deaths seen in this study were 13, all belonging to case group.
- 4 of these (30.77%) expired in NICU. In these, 2 expired due to MAS and other 2 expired due to birth asphyxia.
- 9 of these (69.23%) were IUD.
- In IUD, 3 of them were preterm IUD and 6 of them were full term IUD. In full term IUD, one IUD was associated with eclampsia and another IUD was associated with pre-eclampsia. Rest had no associated causal factors.
- There were no perinatal deaths in this control group.
- Mean cord length in cases and control group were 77.90cm and 72.33cm respectively.

Table No.7 Comparison with other studies in %

Parameters	This study	Pragati Meena *et al* 33	Gupta *et al* 34	shazia Taizon *et al*35
Normal delivery	56.49	75	70	66.7
LSCS	42.86	24	30	26.7
Forceps	0.65	1	1.7	3.3
Loose loop	57.79	85	86.67	-
Tight loop	42.21	15	13.33	-
MSL	9.74	-	6.7	-
Fetal distress	16.23	16	13.3	18.6
APGAR <7 at 5 min	46	10	3.3	30
APGAR 0	5.84	-	-	-
NICU Admission	46.1	17	-	36.66

- Some other studies walker & Pye found male babies had longer cord than female babies and it was assumed due to higher level of intrauterine activities of male fetus.[6]
- According to Leonard schaffer and colleagues neonatal birth weight was more in cases of longer nuchal cord. But walker & Pye, like this study, found no significant difference of birth weight with or without, short or long nuchal cords.[7]

DISCUSSION

- The presence of a nuchal cord is often cited as a major cause of fetal distress, meconium stained amniotic fluid, fetal bradycardia or tachycardia.[8,9]
- There were 46% cases of APGAR score <7/10 at 5 minutes in this study, of which most of them were admitted mainly for post resuscitation care and severely affected babies were admitted for birth asphyxia and MAS which prolonged NICU admissions.
- Larson *et al* evaluated the outcomes of pregnancies with multiple nuchal cord entanglement. They found that multiple nuchal cord loops were associated with an increase in meconium, abnormal FHR patterns in advanced labour, need for operative delivery, and mild umbilical artery acidosis at birth.[10]

CONCLUSION

- The presence of nuchal cord alone is not found to be an indication of caesarean section. But for vaginal delivery of cases with nuchal cord, close monitoring during labour is required as tight and multiple loops are associated with fetal heart variations.
- Type and number of loops also play a role in maternal and neonatal outcome. Fetal compromise, NICU admissions and fetal demise.
- Elective caesarean section in case with nuchal cord is unnecessary which increases maternal morbidity. Operative intervention should be done only in cases of fetal compromise during labour.
- Intrapartum finding of nuchal cord is common in practice but close clinical monitoring during labour and timely intervention are always rewarding.

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