Original Article

PERINATAL OUTCOME IN CASES WITH OR WITHOUT NUCHAL CORD

Shazia Taizon[1]

ABSTRACT:

OBJECTIVE:

To ascertain the fetal outcome in cases with or without nuchal cord.

STUDY DESIGN:

Comparative cross sectional study.

SETTING:

Department Of Obstetrics and Gynaecology, Sharif Medical and Dental College Lahore.

DURATION OF STUDY:

Six months (15th January 2013 to 15th July 2013).

PATIENTS AND METHODS:

A total of sixty cases, 30 with nuchal cord and 30 without nuchal cord were included. It was a non-probability purposive sampling. The labor of these patients was monitored closely by strict partogram and intrapartum non*stress test. The fetal outcome was seen in the form of Apgar score at I minute and 5 minutes.

RESULTS:

The mean age of the women in group A was 24.03 and in group B was 23.97 years. The mean gestational age at delivery in group A 38.65 weeks and group B 38.79 weeks. The results of specific investigations statistically show no significant difference. Twenty patients delivered by normal, 8 by emergency caesarean section and I each by vacuum and mid cavity forceps delivery in group A while in group B, 18 patients delivered by normal, 7 by emergency caesarean section, 3 by vacuum 2 by mid cavity forceps delivery. Birth weight and Apgar score of both groups shows no significance (P<0.05).

CONCLUSION:

This study suggests that presence of nuchal cords is a frequent finding, it increases the rate of cesarean section, but it does not effect neonatal outcome in the form of neonatal morbidity and mortality measured by Apgar score and NICU admission.

KEY WORDS:

Perinatal outcome. Nuchal cord. Apgar score. Fetal outcome.

INTRODUCTION:

It is not a recent idea that umbilical cord coiling can harm the fetus. It has been described as "one of the dangers of eight month" by Hippocrete. In 1657, Harvay suggested that interruption of umbilical cord blood flow may be a cause of fetal death in the fetus with cord compression. While in 1750, the British Obstetrician William Smillie explained a stillborn new born with four loops of umbilical cord.

Taizon S [1]
Senior Registrar
Department of Obstetrics & Gynaecology,
Sharif Medical & Dental College, Lahore.
Sharif Medical City Hospital, Lahore.

In 1957, Kan-Pun-Shui and Estmon [11] published a well-designed study about nuchal cord and its perinatal effects. But they fail to conclude any relationship between the presence of nuchal cord and perinatal mortality. Two subsequent studies also found no relationship between nuchal cord and poor perinatal outcome [12, 13]. In the study by Morrison [1], 48% of full term asphyxiated infants had cord accidents. Stembero and Horska [4] also studied that presence of nuchal cord was associated with transient decrease in blood flow in umbilical cord.

Cord around neck is the umbilical cord which is wrapped 360 degrees around the fetal neck [1]. It is a commonly seen finding and it can affect any pregnancy. Nuchal cord can present in two different pattern. In type A pattern, the umbilical cord crosses the fetal neck in which the placental end of the umbilical cord crosses over the umbilical end. While in type B pattern, the placental end crosses under the umbilical cord[2.] Prevelance of nuchal cord at delivery is extremely high with a single loop reported in 30% of neonates [3.]

There are great variations found regarding the occurrence of nuchal cord as it may be found repetitively in pregnancies from the same mother and family or it may not be present in consecutive pregnancies or may present in a different way. Umbilical cord length can vary depending upon the gravidity i.e., multigravida may have longer umbilical cord length in comparison to primigravida. While in case of twin pregnancy umbilical cord length of fetuses may be shorter than singleton pregnancy [5].

Cord around neck is associated with abnormalities in fetal heart rate during labor and delivery. This effect occur because of the pressure on the umbilical cord, this pressure is not enough to cause fetal demise, but it can lead to increased incidence of operative delivery and caesarean section.

In recent past, the ultrasound diagnosis of cord around neck is made and based upon this observation, this study is conducted so that prenatal detection of cord around neck is done and its influence on the labor and delivery is observed. Fetal monitoring during labor by cardiotocography can vary. CTG can be reactive; it can show variable deceleration and prolonged fetal bradycardia.

The purpose of this study is to compare the perinatal outcome with or without nuchal cord as this will help to ascertain risk factors involved and the importance of ultrasound assessment at admission and proper decision of mode and time of delivery and to assess the need for timely intervention.

In Pakistan few studies have been conducted on this topic. While in developed countries a large number of studies have been conducted regarding nuchal cord. In some studies [2-4], nuchal cord presence was associated with adverse fetal outcome like fetal distress, variable fetal heart rate decelerations, preterm deliveries, low birth weight and rarely perinatal mortality. But in other studies there was no association found between nuchal cord and perinatal complications.

METHODOLOGY:

It was comparative cross-sectional study done in the Department of Obstetrics And Gynecology, Sharif Medical and Dental College Lahore. The duration was six months from I5th January, 2013 to I5th July 2013. A total of 60 cases, 30 with nuchal cord and 30 cases without nuchal cord were taken. It was nonprobability, purposive sampling.

DATA COLLECTION PROCEDURE:

Thirty cases of nuchal cord and 30 cases without nuchal cord which served as control were included. Group A with nuchal cord and group B without nuchal cord. Clinical assessment on the basis of inclusion from outpatient department and indoor patients was done. Patients with third trimester pregnancy and singleton cephalic presentation were

included. While those patients having gestational diabetes, IUGR, oligohydramnios, severe pre-eclampsia and placenta previa were excluded from the study.

They were informed that there were no health hazards involved. The demographic information like name, age and sex was recorded. The history of presenting illness was obtained. They were investigated for routine test like complete blood count, urine complete and blood sugar they were specifically investigated for presence or absence of nuchal cord by Doppler Ultrasound at or around 36 weeks of gestation. Images taken in transverse and sagittal planes to find out the presence or absence of umbilical cord around the fetal neck. Presence of nuchal cord was sought in the transverse and sagittal plane of the neck. These patients was monitored closely by strict partogram and intrapartum cardiotocography. Fetal distress was recorded by CTG and categorized as having fetal bradycardia, variable deceleration or late deceleration. The fetal outcome was seen in the form of Apgar score at 1 and 5 minutes, birth weight, number of loops and need for NICU admission. Data was entered in SPSS version 11 and analyzed. The variable like age was described as descriptive statistics given mean and standard deviation. The variable in history, positive signs, and parity was listed as frequencies and proportions. The outcome of special investigations was presented as frequency distribution and proportions. The numerical outcome like number of loops and Apgar score were presented as mean and standard deviations. To compare the fetal outcome in two groups, Chi-square test and "t" test were applied. A p value of<0.05 was taken as significant.

RESULTS:

Sixty patients were included in the study, through outpatient and indoor departments of Obstetrics and Gynecology Sharif Medical and Dental College Lahore. Patients were divided in two equal groups; first group is assigned letter A with nuchal cord and second group is assigned letter B without nuchal cord. The baseline characteristics of these patients were as follows:

The gestational age at ultrasound in group A is 36.70±0.47weeks and in group B 36.60t0.50 weeks. The difference between the two groups was statistically not significant (p>0.05). When compare the gestational age at delivery, mean age in group A 38.65±0.79 weeks and group B 38.79±0.88 weeks. Statistically the difference was not significant (0.05).

The frequency and Intrapartum monitoring among both groups of non-stress test with tocography and color of liquor is shown in table 2. In group A, CTG of 12 patients were reactive while in group B, 18 patients had reactive CTG. While fetal tachycardia is present in 2 patients in group A and none of group B patient's CTG shows fetal tachycardia. Late deceleration was present in 5 cases (16.7%) of group A, while 3(10%) cases among group B shows late deceleration. Variable deceleration was present in 5(16.7%) cases of group A and 3(10%) cases of group B. Based upon the above results, it is shown that the CTG abnormalities are more frequently observed in cases with cord around neck than in cases without cord around neck. The incidence of grade 1 and grade 2 meconium is higher in cases with cord around neck than in cases without cord around neck.

Out of 30 deliveries, 20 (66.7%) patients delivered by normal vaginal delivery, 8(26.7%) by emergency caesarean section, 1(3.3%) by vacuum and 1(3.3%) by mid cavity forceps delivery in group A. while in group B, 18(60%) patients delivered by normal vaginal delivery, 7(43.4%) by emergency caesarean section, 3(10%) by vacuum and 2(6.6%) by mid cavity forceps delivery (table 3). This study shows a slightly higher rate of emergency cesarean section in cases with nuchal cord but no increase in the rate of instrumental delivery.

The comparison of fetal outcome of male to male and female to female is not significant and neonatal intensive care unit (NICU) admission is significant in both groups. The "t" test applied of birth weight, Apgar score, statistically the difference is not significant.

DISTRIBUTION OF CASES ACCORDING TO MODE OF DELIVERY

Mode of delivery	Group A (■ - 30)		Group B (n = 30)	
	Number	Percentage	Number	Percentage
Normal	20	66.7	18	60.0
Emergency Caesarean Section	8	26.7	7	23.4
Vacuum	1	3.3	3	10.0
Mid cavity forceps delivery	1	33	2	6.6

FETAL OUTCOME IN BOTH GROUPS

Fetal outcome	Group A	Group B	Chi square value	P value
Sex				
Male	16	18	.602	>0.05
Female	14	12	.429	>0.05
Neonatal NICU admission	II	3	.015	<0.05
			test value	
Birth weight	3.60 ±0.34	2.99 ±0.32	.469	>0.05
Apgar score at				
1 minute	6.40+1.10	6.47 ±0.86	.795	>0.05
5 minutes	8.57 + 0.50	8.73 ±0.45	.182	>0.05

Group A With nuchal cord

Group B Without nuchal cord

DISCUSSION:

Nuchal cord is a frequent finding at the time of delivery and 25% babies have umbilical cord wrapped around their neck at the time of delivery. One loop of cord around neck is present in 20-33% of term gestations. Larson et al [5] stated that risk of cord around neck increases from 5.8% at 20 weeks to 29% at 42 weeks. Nuchal cord can be prenatally detected by color Doppler ultrasound with a sensitivity of 90% after 36 weeks of gestation.

In this study, there was no association found between cord around neck and maternal age. Presence of nuchal cord had no influence on the duration of pregnancy, and this finding was also reported by other studies [10-13].

In this study, nuchal cord is not associated with adverse perinatal outcome which is also confirmed by Eyel Sheiner and colleagues in 2006 by a retrospective population based study. Electronic fetal heart rate monitoring shows increased rate of late and variable

deceleration in cases with nuchal cord than without nuchal cord. So there are more chances of fetal distress as evidenced by CTG abnormalities in cases with nuchal cord. In a study by Fisher[1,] fetal distress was twice as common in births complicated by nuchal cord. Fetal distress on CTG were found more commonly in the group with nuchal cord (18.6% as compared to 12.6%) $p<0.01$ in the present study. This finding is consistent with that found by Bruce et al who studied 8083 births and found cord compression to be the major factor associated with the variable decelerations. Similar increases in both moderate and severe variable deceleration in labors complicated by nuchal cord have been reported by other authors.

In the present study, over 26.4% of deliveries in group A were complicated by some form of meconium staining while in group B meconium was present in 6.6% cases, which differs with the finding of Spellacy et al, that incidence of meconium is not increased by nuchal cords.

Incidence of emergency LSCS was more in group with cord around neck (26.7%) as compared to (23.4%) in group without nuchal cord. Pritchard and colleagues [15] found no difference in mode of deliveries with and without nuchal cord. The rate of instrumental deliveries were more common in those pregnancies without nuchal cord, although this is controversial in literature [10, 12,14].

Infant sex was not significantly associated with nuchal cords, although one study did suggest that more boys are born with nuchal cord. The present study also showed that frequency of nuchal cord is more in boys than girls in group A.

Nuchal cord is known to cause fetal bradycardia and acidosis, but Apgar score at 1 and 5 minute is not affected that much. This study did not show a significant difference in mean 1 minute Apgar score between two groups, although the nuchal cord group did tend to have a large percentage of infants born with Apgar score of less than 7. This difference was absent at 5 minutes after birth, so it is suggested that effect of nuchal cord on the fetus is only transient with no long term effects. Other studies also support this finding that nuchal cord did not cause fetal compromise in the long term. [12-14].

It is interesting to note that the Apgar score in the nuchal cord group of this study were comparable to those of the control group, despite the much higher occurrence of fetal distress noted during labor. It may be that the Apgar score is a better indicator of the newborn's health at the time of birth than the fluctuations in heart rate noted during labor.

Eleven neonates need neonatal intensive care unit admission in group with cord around neck while only 3 neonates needed admission to intensive care in group B which shows high neonatal morbidity in cases with nuchal cord as compared to those without nuchal cord.

Another interesting finding in this study which was though not the primary objective of this study is that infants born with nuchal cords weighed more than those in the control group. The difference of 600 grams was statistically significant ($p <.01$) although the clinical significance of this finding is unclear. These findings have not been reported in the past, and further studies would need to be done to determine the actual significance of nuchal cords on intrauterine growth.

CONCLUSION:

On the basis of our results, it is concluded from this study that prenatal detection of cord around neck by Doppler ultrasound can help the obstetrician to be more vigilant to monitor the labor of these patients with cord around neck, as it increases the rate of caesarean section but results of the study fails to show any adverse fetal outcome which are measured by one and five minute Apgar score and need for neonatal intensive care unit admission. Our findings help the sonologist and obstetrician in

counseling parents with this condition who may be frightened unnecessarily.

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