Original Article

Cord Around Fetal Neck and Its Outcome

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Abstract

Objectives: The neonatal outcome in patients with fetal nuchal cord and find out safe mode of delivery accordingly.

Methodology: This analytical study of 168 cases of cord around the neck was carried out in department of Obstetrics and Gynaecology A unit of Khyber Teaching Hospital during the period of one year i.e. from January 2016 till December 2016. The parity, age, mode of delivery of mothers were noted. Apgar score at 1 and 5 minutes after birth were recorded.

Results: These patients included 58.69% multigravidas, with 71.4% being in 38-40 weeks period of gestation. 55.90% had a single loop of cord. 66.6% patients had a normal delivery while 33.3 % patients underwent operative delivery. APGAR score was 7 – 10 in most of the neonates i.e. 150 cases.

Conclusion: Loop of cord around the fetal neck does not affect the mode of delivery and fetal outcome is equally satisfactory.

Key Words: Loop of Cord, Perinatal Outcome, Doppler Ultrasound.

Cite this article as: Iqbal M, Muhammad Z, Iqbal S. Cord Around Fetal Neck and Its Outcome. J. Soc. Obstet. Gynaecol. Pak. 2017; Vol 7(3):133-136.

Introduction

When the umbilical cord gets entangled around the fetal neck by 360 degrees, become a nuchal cord.[1] It is subdivided in to "Type A" nuchal cord that is coiled around the neck by 360 degrees and "Type B" pattern is a true knot which cannot be undone.[2] Nuchal cords have prevalence rates of 6% to 37% and thus very common.[3] Approximately half of the nuchal cords resolve before delivery.[4] The incidence increases as the pregnancy advance from 5.8% at 20 weeks of gestation up to 29% at 42 weeks of gestation.[5]

The effect of nuchal cord on the fetus has long been the topic of great controversy. Ultrasound diagnosis of a nuchal cord was first labelled in 1982.[6] Usually, they do not cause harm but occasionally may be so tight to constrict the umbilical vessels and consequent hypoxia may occur.[7,8] Retrospective data of over 182,000 births, suggests that either a single or multiple loops of nuchal cord in labour or delivery does not affect perinatal outcomes adversely.[9,10,11] Although few studies have mentioned that a tight nuchal cord is associated with short-term morbidity such as unequivocal CTG pattern but these effects were transient. [12]

The aim of current study was to find out the incidence of cord around the fetal neck in patients presenting to Gynae A Ward of KTH and its effects on perinatal outcome, intrapartum complications and mode of delivery.

Authorship Contribution: [1]Substantial contribution to the concept and designed, analysis and interpretation of data, drafting the article and revising it critically.[2] Contributed in the analysis and interpretation of data regarding neonatal outcome, drafting the article and revising it critically.[3]Analyzed and interpreted the sonographic data, drafting the article and revising it critically

Funding Source: none
Conflict of Interest: none

Received: June 19, 2017
Accepted: Sept 8,2017

Methodology

This is an observational (analytical) study where 168 diagnosed cases loop of cord were collected over a period of 12 months (January 2016 – December 2016). The cases were collected from the obstetrics A unit of Khyber Teaching Hospital, Peshawar. The parity, period of gestation, number of loops around the fetal neck and associated obstetric factors affecting the mode of delivery were analyzed. Those patients who had some other indication for C-Section along with nuchal cord were excluded from the study The radiology department of the hospital was involved to help us confirm the presence/absence of the nuchal cord. SONOACE X6 version 1.03:00.066 ultrasound machine with 3.5mhz abdominal probe using grayscale and colour Doppler imaging was employed. Presence of cord was sought in transverse and sagital plane of neck. A cord around the fetal neck was diagnosed if the cord was found around at least 3 of the 4 dimensions of the neck. Nuchal cord can be detected using color Doppler ultrasound with a sensitivity and specificity of about 90%.[11] The patients had an ultrasound at first antenatal visit and was repeated in the last trimester and prelabour if a loop of cord around the neck was detected on the initial visit. Neonatal outcome was measured by recording APGAR Score at 1 and 5 minutes after birth.

Results

A total number of patients were 173. Of these 112 (66.6%) had a vaginal delivery while 56 (33.6) underwent a cesarean section and 5 were excluded from the statistics as two of them had no loop of cord at delivery and 3 had some other indication for C-Section. Of these patients, 69(41.07%) were primigravidas while 99(58.9%) were multigravidas. 120(71.4%) had a period of gestation 38-40 weeks. Majority patients i.e. 94(55.9%) had a single loop of cord. In this group 66 patients had a vaginal delivery and 28 cesarean section. 50 patients had 2 loops of cords around the neck. Of these 32 patients had a vaginal delivery and 18 ended in a cesarean section. 24(12.5%) had three loops of cord around the neck. Of these 14 patients had a vaginal delivery while 10 had a cesarean section. Of these babies, 115(68.1%) were in 2.6-3.0kg weight group. 17 patients had a nonreassuring fetal heart rate pattern and 15 patients with meconium staining of liquor underwent cesarean section. In our study fetal distress is 19.06% while in another study[14] it is 10%. 8 patients with prolonged labour had cesarean section. 7 babies had intrauterine growth restriction and their induction failed. 6 patients opted for an elective cesarean section mostly primigravida reluctant to take any risk. In our study, 66.6% had a vaginal delivery while 33.3% patients had a cesarean section while in another study[14] vaginal delivery was 75% and cesarean section rate was 24%. In cases of vaginal delivery 5 patients had a vacuum assisted delivery, 6 babies had low Apgar score and were shifted to the nursery. No significant acute or long-term morbidity occurred. No fetal mortality occurred in this group irrespective of mode of delivery.

Thirteen babies were born with multiple tight loops of nuchal cord also showed low Apgar score in 1 min i.e. less than 7, but there was no significant difference (p= 0.06) of Apgar score between single and multiple nuchal cord after 5 minutes, as only 3 babies had A/S <7 at 5min.

Table I: Period of gestation

POG	Vaginal Delivery	C-Section	Total
36 – 37 weeks	3 (2.67 %)	6 (10.7 %)	15 (8.92 %)
38 – 40 weeks	98 (79.4 %)	38 (67.8 %)	120 (71.4 %)
41 – 42 weeks	20 (17.8 %)	19 (33.9 %)	33 (19.6 %)
Total	112 (66.6 %)	56 (33.3 %)	168 (100 %)

Table II: Mode of delivery in relation to nuchal cord

Loops	Vaginal delivery	Caesarean section	Total
1	66 (58.9 %)	28 (50 %)	94 (55.9 %)
2	32 (28.5 %)	18 (32 %)	50 (29.7 5)
3	14 (12.5 %)	10 (17.8 %)	24 (14.2 %)
Total	112 (66.6 %)	56 (33.3 %)	168

Table-III: Caesarean section Indications in cases with nuchal cord

Indications Number of Cases	Indications Number of Cases
Fetal distress	32 (57 %)
Prolonged 2nd stage of labor	8 (14 %)
IUGR with failed induction	7 (12.5 %)
Post caesarean pregnancy	9 (16%)
Total	56

Table-IV: Apgar score of neonates with nuchal cords (n=168)				
Apgar score	At 01 min		At 05 min	
	Single	Multiple	Single	Multiple
00 – 04	6 (5.16%)	2 (3.8 %)	0	1 \(1.92 %)
05 – 06	37 (31.8 %)	11 (21.1 %)	14 (12.83 %)	3 (5.76 %)
07 – 10	73 (62.87 %)	39 (75 %)	102 (87.9%)	48 (92.3 %)
Total	116	52	116	52

Discussion

In 1962, Nuchal cord was defined by Crawford as the condition in which the umbilical cord was coiled around the neck of the fetus.[13] Early nuchal cords that form early can resolve at any time or persist until term. In contrary, cord may be coiled around fetal neck shortly before delivery.[14,15] The frequency of nuchal cord in our study was 5.29% (169 out of 3191 deliveries). The frequency in one of the Indian studies ranged from 5.3% to 10.9%[16, 17] which tallies with our study. But Miser etc al and Shrestha observed quite higher (24%) incidence.[18,19] Age of most of the patients (45.2%) varied from 21-25 years, as this age group comprises of reproductive age group. Multigravida were 58.9% and primigravida 41.07% which is in accordance with studies carried out by Gardiner et al, but according to Adinma there was no relation between parity and nuchal cord.[20,21] In our study CTG variation was observed in 32 (19.04%). 10 had variable deceleration which is in accordance to the study done by KK Dhar et al and Janet D Larson3,12. Kitagawa M in 1989 analysed umbilical cord ABGs and CTG. They found that there is significant relationship between variable deceleration and low Apgar score.[22] The frequency of Caesarean Section with cord around the neck in our study was 33.3% while fetal distress is the commonest cause (32 out of 56). [23] Most of the babies in this study had Apgar score of 7-10 after 1 min (112 cases) and 5 min (150 cases). The number of babies with the low Apgar score at 1 min was 56 (33.3%). 18 (10.7%) babies had Apgar score >7 after 05 min (5.20%) which suggests that any adverse effect is only temporary. These findings correlate with other studies and suggest that nuchal cords were not a major cause of fetal hypoxemia or apnea.[14,23,24] Cord around fetal neck can be diagnosed on ultrasound with great reliability particularly using color flow doppler imaging.[2,9,10] Clapp and Larson found that the incidence rises linearly with advancing gestation.[6,7,10] Our data also depicts the same trend.

Conclusion

The diagnosis of a nuchal cord antenatally via ultrasound is not an indication for Caesarean Section. Although these patients need vigilant intrapartum evaluation by continuous electronic fetal heart rate monitoring. Color Doppler ultrasound of the umbilical cord vessels may be needed where there are variable decelerations and/or other abnormal findings in the fetal cardiotocograph. Results of our study suggest that vaginal delivery can be carried out safely with good Apgar score despite variable decelerations on CTG.

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