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FETO-Maternal Outcome in Primigravida Having Single Loop of Cord Round the Neck

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Abstract: *The objectives of the study were to compare the progress of labour, need of medical and surgical interventions and fetomaternal outcome in primigravidae with cord round neck versus without cord round neck at term or onset of labour. This study was performed at Mahila chiktsalaya, SMS Medical college Jaipur l from dec 2010 to December 2011. A total of 200 cases were studied over a 1 yr period. Among these, 100 had cord round neck and 100 control without cord round neck. 75% cases had delivered vaginally and cesarean was done in 24% cases . Instrumental delivery in1% . Among control groups 91% women delivered vaginally. Casarean was done in 9% Obstetrical and neonatalvariables were compared in the loose and tight nuchal cord groups and a control group (no nuchal cord) Majority of cases 75% were delivered vaginally wit minimal maternal fetal morbidity indicates that cord round the neck is not an indication for cesarean until unless cord was tight and causing fetal distress. Loose nuchal cord may not associated with adverse perinatal outcome. However, tight nuchal cord associated with increased risk of low apgar score, increased NICU admission. Evidence of fetal distress cases seen in 16% cases and outcome was poor in 3% cases. As compared to control group fetal distress was seen in 9% and fetal outcome was poor only in 0%. Maternal outcome was good in 100% in both control and cases.*

Key words: *color Doppler flow; nuchal cord; prenatal diagnosis*

I. Introduction:

A nuchal cord occurs when the umbilical cord becomes wrapped 360 degrees around the fetal neck. Nuchal cords are very common, with prevalence rates ranging between 6% to 37% . The cord round neck the condition in which the umbilical cord is wound around the neck of foetus is believed by obstetricians to be the underlying cause of unexplained foetal distress, neonatal depression, and has even been attributed to be a frequent cause of perinatal morbidity.

Many publications in the medical literature have reported an association of a nuchalcord with an increased risk of adverse pregnancyoutcomes. These include meconium stained amniotic fluid, low 5-minute Apgar scores, an increased rate of caesarean deliveries, fetal heart decelerations, umbilical artery acidemia, growth restriction, and even intrauterine fetal death.The role of sonography in the prenatal diagnosis of a nuchal cord has been validated in many previous publications. The use of color Doppler flow has increased the accuracy of this prenatal diagnosis.Nowadays, sonologists, obstetricians, and, more importantly, parents face this diagnosis more frequently since sonographic examination has become routine practice during prenatal care. Most of the previous publications described outcomes of pregnancies with nuchal cords detected before delivery.

Our main objective was to find out the maternal morbidity,perinatal morbidity and ,perinatal mortality due to cord round neck.

Umbilical cord / FUNIS – **forms the connecting link between fetus and placenta through which the foetal blood to and from the placenta.**

Cord Length of umbilical cord varies from no cord (Achordia to 300 cm with diameter upto 3 cm with upto 380 helices. An average umbilical cord length 55 cm with diameter 1-2 cm and 11 helices.

Short Cord – may be true (less then 35 cm) or relatively due to entanglement of the cord around neck or any foetal part. It may cause

1. Failure of external version
2. Prevent descent of the presenting part specially during labour.

3. Early separation of normally situated placenta
4. Favour malpresentation

Long Cord - > 80 cm The clinical significance due to presence of a long cord is that there is increase chance of
1. cord prolapse
2. Cord entanglement
3. True knot

II. Materials And Methods

This prospective study was conducted at Mahila Chikitsalya Sanganeri Gate, S.M.S. Medical College, Jaipur from December 2010 to December 2011. This study was comprised 200 Primigravida patient with term pregnancy among them 100 Patients with cord around neck and 100 patients without cord round neck ,who admitted in labour room. First 100 cases fulfilling criteria area were enrolled for the study. Gestational age was calculated from reliable menstrual history and early sonographic measurement of CRL. control 100 patients selected who were matched for gestational age and maternal age, without any medical illness and surgical illness without any obstetrics complication and without cord round neck.Patients were excluded from study if they Multi gravida,Malpresentation ,Double/ multiple of loop of cord around Neck,Fetal Anomalies,Oligohydramnios ,Polyhydramnios,Cephalo Pelvic Disproportion, Antepartum Haemorrhage, PIH,IUGR ,Presence of Medical & Surgical Illness & Obstetrics complication was excluded from study..
This study was approved by institutional review board

III. Methodology:

A detailed history regarding duration of amenorrhoea, gravidity, duration of pregnancy and history of labour pains. · general physical examination (i.e. height, weight), abdominal examination for fundal height ,lie,presentation, engagement, amount of liquor, estimated fetal weight, palpable uterine contractions and fetal heart rate · per vaginal examination for assessing cervical dilation and effacement, membrane status, presentation and pelvic assessment was done. bishops score was calculated. regarding history of toxemia, hypertension, antepartum hemorrhage was taken.. all routine blood investigations along with ultrasonography was done. Patients above 37 weeks and not in labour, were induced using prostaglandins. Duration of latent phase of labour was measured and patients with inadequate uterine contractions were augmented with oxytocin. The course of labour in all the patients was recorded on partograph. All the patients were studied in detail with reference to the course of labour, intervention required, mode of delivery and fetomaternal outcome. .

Ultrasound is unable to conclusively diagnose cord round the neck. Colour Doppler study was required for confirmation of diagnosis. The following variables were recorded: maternal age;gestational age at delivery; parity; fetal presentation; mode of delivery (normal vaginal delivery, instrumental delivery, cesarean section); abruptio placenta; the notion of fetal distress during labor based on presence of meconium in the amniotic fluid and/or abnormal fetal heart rate; birth weight; Apgar score at the 1st and 5th minutes; transfer to the neonatology unit; the presence of nuchal cord at delivery, the number of loops and whether it was loose or tight.

IV. Statistical Analysis

Patients were divided into case and control and data were analyzed by using chi-square test.

V. Results:

Out of the 200 deliveries that occurred during the study period, 47.5% had a nuchal cord documented at birth Of the total cases of nuchal cord, 80% were loose and 15% were tight.
The fetomaternal outcome were studied and these are described below.

Table 1 Distribution Of Study Participants According To Stage Of Labour

GROUP	STAGE I*				STAGE II**			
	NORMAL		PROLONGED		NORMAL		PROLONGED	
	NO.	%	NO.	%	NO.	%	NO.	%
CASE	63	63.00	37	37.00	72	72.00	28	28.00
CONTROL	83	83.00	17	17.00	85	85.00	15	15.00
TOTAL	146	73.00	54	27.00	157	78.50	43	21.50

*Chi-Square = 9.158 With 1 Degree Of Freedom; P = 0.002
**Chi-Square = 4.266 With 1 Degree Of Freedom; P = 0.039

The above table shows that duration of stage I, II in present study group is normal in 63% and 72% respectively and prolonged labour stage I, II and 37% and 28% cases respectively. In control group duration of labour stage I, II is normal in 83% and 85% respectively. Prolonged labour stage I, II in 17% and 15% respectively in control group. This indicates cord round neck definitely affect progress of labour.

TABLE 2 Distribution Of Study Participants According To Mode Of Delivery

MODE OF DELIVERY	CASE		CONTROL	
	NO.	%	NO.	%
NVD	75	75.00	91	91%
CS	24	24.00	9	9.00
FORCEP DELIVERY	1	1.00	0	0.00
TOTAL	100	100.00	100	100.00

The above table shows that vaginal delivery in 75% cases, cesarean in 24%, forceps delivery in 1% of case group. In control group 91% had vaginal delivery, cesarean in 9% control group. There was increase incidence of cesarean, forceps delivery with nuchal cord group as compared to without nuchal cord group. This indicates that there is significant association between nuchal cord and mode of delivery.

Table 3 Distribution Of Cases According To Cord And Fetal Distress

CORD	FETAL DISTRESS		NO FETAL DISTRESS		TOTAL	
	NO.	%	NO.	%	NO.	%
LOOSE	9	10.59	76	89.41	85	100.00
TIGHT	7	46.67	8	53.33	15	100.00
TOTAL	16	16.00	84	84.00	100	100.00

Chi-Square = 9.810 With 1 Degree Of Freedom; P = 0.002

The above table depicting that tight cord was factor in causing fetal distress in 46.67% and 10.59% had fetal distress with loose cord. This indicates that despite highly efficient supervision apgar score found to be low, on analyzing this group of patient was with tight loop but there no method available to measure length of cord and to predict how short it will become after looping. This again implies that cases with nuchal cord need extra vigilance to avoid catastrophes as a result of cord compression.

Table 4 Distribution Of Study Participants According To Apgar Score

APGAR SCORE	CASE		CONTROL		TOTAL	
AT 1 MIN*	NO.	%	NO.	%	NO.	%
<7/10	13	13.00	4	4.00	17	8.50
>7/10	87	87.00	96	96.00	183	91.50
TOTAL	100	100.00	100	100.00	200	100.00
AT 5 MIN**						
<7/10	10	10.00	4	4.00	14	7.00
>7/10	90	90.00	96	96.00	186	93.00
TOTAL	100	100.00	100	100.00	200	100.00

*Chi-Square = 4.114 With 1 Degree Of Freedom; P = 0.043

**Chi-Square = 1.920 With 1 Degree Of Freedom; P = 0.166

The above table shows that apgar score below <7/10 at 1 min and 5 minute is 13% and 10% cases respectively as compared to control in which only 4% had apgar score below 7/10. This indicates that cord round neck definitely affect apgar score of child at birth, there were significant effect of nuchal cord on apgar score of the neonate in study group, this indicates that despite highly efficient supervision agar score was found to be low at 1 min and 5 min on analyzing this group of patient it was with tight loop, but there is no method available to measure length of cord and to predict how short it will become after looping. Although by modern doppler technique we can find out the number of loops but it is also not 100% efficacious.

Table 5 Distribution Of Study Participants According To Nicu Admission

NICU ADMISSION	CASE		CONTROL		TOTAL	
	NO.	%	NO.	%	NO.	%
PRESENT	17	17.00	5	5.00	22	11.00
ABSENT	83	83.00	95	95.00	178	89.00
TOTAL	100	100.00	100	100.00	200	100.00

Chi-Square = 6.180 With 1 Degree Of Freedom; P = 0.013

The above table indicates that hospital stay was more or prolonged (NICU) in case group 17% as compared to control group (4%) .These neonates were those infants who had low apgar score at 1 min, 5 min and 15 min interval due to asphyxia probably by strangulating loop of nuchal cord. This indicates that cord round neck definitely affect NICU admission of baby

Table 16 Distribution Of Study Participants According To Colour Doppler Usg

Colour Doppler Usg	After Delivery		Total
	Positive	Negative	
Positive	88	10	98
Negative	4	98	102
Total	92	108	200

Diagnostic Accuracy Of Color Doppeler

COLOUR DOPPLER	RESULT	%
SENSITIVITY	88/92	95.65
SPECIFICITY	98/108	90.74
PPV	88/98	89.80
NPV	98/102	96.07

The above table shows that out of 200 patients examined by color doppler by USG, 95.65% of the patients were diagnosed by color doppler USG. Thus it can be velamentically said that 100% confirmation of cord round neck can not be made in antenatal period, it always at delivery that direct visualization of nuchal cord is possible. On statistically analyzing these facts it is evident from table that sensitive and specificity 95.65% and 90.74% respectively for nuchal cord. Sensitivity decreased in present study group because of subjective variations.

VI. Discussion

This study was carried out on two hundred primigravidas,100 with cord round neck and 100 Without cord round neck attending labour room from dec2010 to December 2011. prolonged labour occurred in 37% of study group as compared to 17% in non nuchal cord group. More commonly associated with tight nuchal cord group. Similar results obtained by Ogeuch et al (2006), Char KK et a (1993) that concluded that incidence prolonged labour more with tight cord then loose cord round neck. Cesarean rate in this study was 33% out of which 24% were with nuchal cord and 9% were without nuchal cord group. It means that nuchal cordis a potent factorfor abnormal parameters during labour from normal leading to cesarean section, 75% cases had delivered vaginally and cesarean was done in 24% cases . Instrumental delivery in1% . Among control groups 91% women delivered vaginally. Casarean was done in 9% . These results were consistentwith the results of many studies

Maternal morbidity was higher in women with floating head with nuchal cord. Evidence of fetal distress cases seen in 16% cases and outcome was poor in 3% cases. As compared to control group fetal distress was seen in 9% and fetal outcome was poor only in 0%. Maternal outcome was good in 100% in both control and cases. The baby shifted to nursery in 17% cases hence cord round the neck is a important cause of perinatal morbidity. Apgar score was definitely low at 1 min, 5 min and 15 min in the presence of nuchal cord as compared to women without nuchal cord.

Neonatal sex was independent of nuchal cord but neonatal weight and NICU admission were slightly affected in nuchal cord group as compared to non nuchal cord cases. on statistically analysing facts color Doppler usg it is evident from table sensitivity 95.65% and specificity stands at 90.74%, negative predictive value 96.07 was and positive predictive value 89.80.Sensitivity of color doppler USG in diagnosing nuchal cord according to study is 95.65%, where as specificity stands at 90.74%, negative predictive value 96.07 was and positive predictive value 89.80 .

VII. Conclusions:

Loose nuchal cord may not be associated with adverse perinataloutcome. However, tight nuchal cord may be associatedwith increased risk of low Apgar score < 7 at the1st minute and increased incidence of fetal distress without an associated increase in transfer rates to neonatology unit..

Consequently, the ultrasound diagnosis of a nuchal cord at the end of pregnancy should not be the indication of elective cesarean delivery. . the nuchal cord does not increase the chances of cesarean delivery. sonographically detected nuchal cords during third trimesters of pregnancy are not associated with important perinatal complications ,there was no significant evidence to incriminate the cord round neck to be responsible

for the perinatal death. Ultrasound is very reliable modality in diagnosing in nuchal cord, even then direct visualization of nuchal cord of the neonate at delivery is without fallacy and this the gold standard for delivering cord round neck Our findings may help sonologists in counseling parents with this condition who may be frightened unnecessarily

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