

CORD AROUND NECK IN SINGLETON TERM PREGNANCIES AND ITS OUTCOME

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ABSTRACT

Objectives: To enlist the complications with nuchal cord in singleton term pregnancies and to determine maternal and fetal outcome in singleton term pregnancies.

Design: Descriptive study.

Place and duration of study: The study was carried out at Gynaecology and Obstetric department Combined Military Hospital Quetta from Nov 2007 to May 2008.

Patients and methods: One hundred women irrespective of parity with healthy, singleton term pregnancy and cephalic presentation, labouring or not labouring, were selected from outpatient department. A total of 41 patients were booked with Doppler ultrasound done in antenatal period. Other 59 were poorly booked and diagnosed with cord around neck by clinical criteria e.g. high head at term, fetal distress, meconium discharge, slow progress in labour leading to prolonged labour. All patients signed well informed written proforma regarding study and its outcome. Vigilant fetomaternal monitoring was done during labour. All events during labour were mentioned in proformas which were attached with patients case notes. Data was interperated in term of frequency and percentages.

Results: Complications with cord around neck found were still birth 3%, fetal distress 15%, intrauterine death 1%. Prolonged labour was seen in 14%, Meconium discharge in 5%, and high presenting part was found in 11% of cases. Maternal outcome were elective caesarean section in 6%, emergency caesarean-section in 32%, spontaneous vaginal delivery in 54% and instrumental vaginal delivery in 8% of the cases. Different fetal outcomes seen were intrauterine death, stillbirth in 1%, and 3% patients respectively. Regarding neonatal outcome, 31% stayed in neonatal intensive care unit (NICU) for less than 48 hours, 69% stayed in NICU for more than 48 hours out of which 4% had early neonatal deaths (ENND). Fifty nine percent patients detected and suspected during labour were with, high head, slow progress in labour, decreased fetal movements, intra partum fetal distress, meconium stained labour. Cord length was measured, 60 cm in 28%, 53 cm in 21%, 74 cm in 51% of patients. Longer length of cord (74 cm) was seen in patients ended up into emergency cesarean.

Conclusion: Cord around neck can be delivered vaginally if monitored carefully. Immediate action is required in case of any complication to get good maternal and fetal outcome and to avoid morbidity and mortality with cord around neck.

Keywords: Cord around neck, Doppler ultrasound, Meconium, Nuchal cord, Stillbirth.

INTRODUCTION

When the umbilical cord becomes wrapped around the fetal neck by 360 degree, it is called nuchal cord¹ with increasing from 12% at 24 -26 week to 37% at term². Incidence of umbilical cord accidents is 15% in all sudden antenatal death syndromes (SADS)³. Nuchal cord is common finding affecting the labour and subsequent neonatal status⁴. The human umbilical cord can

undergo a variety of malformations and iatrogenic events throughout pregnancy. If cord around neck is tight, it causes delay in descend resulting in slow progress in labour and fetal distress as cord tightens during contractions. If it persists the patient would end into caesarean section⁵. When an emergency caesarean section is needed, the ideal time from decision to incision is less than 20 min. Cord around neck causes dystocia which is main cause of increased incidence of caesarean section. Mostly primary caesarean-sections are due to dystocia⁷.

Incidence of still birth due to delay in management with umbilical cord accidents is

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15%³. Incidence of Still births in antepartum period is 60% after 34 weeks, 25% between 36-40 weeks. This suggest, specific time to evaluate and deliver the fetus at risk of umbilical cord accident and associated still birth². Nuchal cord is significant cause of still birth reviewing 68870 singleton pregnancies reaching 3.6 deaths per 1000 births after exclusion of congenital malformations².

Cerebral palsy, one of the morbidities associated with cord around neck, is the worst outcome associated with birth hypoxia with difficult labour due to intermittent umbilical flow obstruction and partial oxygen insufficiency. Birth asphyxia for 8–10 min leads to visible brain damage. Tight cord around neck is associated with increased oxygen radical activity and low APGAR score at 1 minute⁸. Nuchal cord causes fetal distress, birth asphyxia, still birth, cerebral palsy and difficult labour so timely decision can minimize these hazards. These babies are more likely to have gross or minor neuro motor dysfunctions and show increased need for special education (34%)⁸. If neurological harm occurs as a result of umbilical cord problems, then this mechanism of harm to the fetus needs to be investigated. It is estimated that 15% of children have learning disability. The issue of cerebral palsy is important, but currently no solution and few insights exist as to its origin. It is estimated that every third to fourth delivery has an identifiable umbilical cord abnormality with demonstrable deficit in academic achievement and less likely to have professional and managerial jobs and significantly lower incomes⁹.

The purpose of this study was to highlight concept of safe delivery in high risk situation of cord around neck so that perinatal morbidity and mortality and rate of caesarean section can be decreased so preventing the stillbirth of a normal fetus would be an important step in identifying cord-related harms.

PATIENTS AND METHODS

This descriptive study was conducted out at department of Gynaecology and Obstetric Combined Military hospital Quetta from Nov 2007 to May 2008. Total 100 patients were included in study.

Hundred women irrespective of parity with healthy, singleton term pregnancy and cephalic presentation, labouring or not labouring, were included in this study. Out of them 41 patients were booked with Doppler ultrasound for detection of cord around neck. Other 59 patients were poorly booked and were diagnosed in labour with clinical criteria like high head at term, fetal distress in labour, passage of meconium, and slow progress in labour leading to prolonged labour.

Women excluded from study were with gross fetal anomaly, poly or oligo hydroamnios, intrauterine death, malpresentation, multiple pregnancy and maternal medical disorder because of their great association with adverse maternal and fetal outcomes and health volunteers.

Patients were admitted and informed consent was signed. Approval from hospital ethical committee was taken. History regarding patient's age, marital status, obstetrical and gynaecological background was taken. Patients were asked about gestational age, fetal movement, vaginal bleeding and any history of dai handling. All women were examined for pallor, blood pressure, pulse, lymph nodes, thyroid and body mass index. Detail obstetrical examination for fundal height, fetal heart sound, lie and presentation and engagement of presenting part was done. Bishop score was calculated and adequacy of pelvis was checked. Base line investigation including blood group and Rhesus factor, complete blood and urine examination, hepatitis B and C screening and blood glucose level, were done. Doppler ultrasound for diagnosis of cord around neck was done. Patient at admission in labour room was counselled about complications associated

with cord around neck. Strict fetal monitoring (intrapartum cardiotocography (CTG), intermittent auscultation of fetal heart) with fetoscope was done after every 15 minute in first stage of labour and after every contraction in second stage of labour. Artificial rupture of membrane was done at 4 cm and colour of liquor was noted. Delivery was conducted with strict fetomaternal monitoring. Pediatrician and anesthetist were also informed and were kept stand by for delivery. Neonates requiring hospital admission for < 48 hours were those in which active resuscitation was done. Oxygen therapy was given and they were shifted to NICU immediately after advice of neonatologist.

APGAR score was defined as general appearance of baby at 1 and 5 minute of birth assessed by respiration, heart, body colour, tone, activity.

APGAR score less than 3 at 1 minute and 5 minutes was taken as poor and more than 7 at 1 minutes and 10 at 5 minute, was good APGAR score.

Informations including patient particulars, all maternal and fetal complication, maternal and fetal outcome, admission in NICU were mentioned in data collection sheet and attached with each patient's case notes. Data had been analyzed using SPSS version 15. Descriptive statistics were used to describe the results like frequency and percentage for qualitative variables.

RESULTS

Total 100 patients were included in the study. Among all women presenting at term (>37 weeks) with singleton healthy pregnancy with cephalic presentation, forty one (41 %) of patients were diagnosed in antenatal period by Doppler ultrasound. Fifty nine (59%) were diagnosed in labour. Total number of patients undergone trial of labour were ninety four (94%). Twenty seven (27%) patients were induced because cord around neck is not contraindication to induction but a risk factor. Total 54% patients underwent spontaneous vaginal delivery. Eight (8%) had

instrumental delivery. Elective caesarean section and emergency caesarean section was done in 6% and 32% of patients respectively (Figure-1). Patients who underwent elective caesarean section were booked and informed about complications with cord around neck. They had no other indication for caesarean like fetal distress, previous scar, malpresentation. They opted for elective surgery because of associated complications with cord around neck. Prolonged labour in 14% meconium in 5% and high presenting part was seen in 11% of cases.

Different fetal complications with cord around neck were as followed still birth in 3%, fetal distress in 15%, intrauterine death in 1%. They were seen in patients who were diagnosed in labour.

Babies (69%) delivered with poor APGAR score were immediately shifted to NICU and reviewed by neonatologist. They stayed in NICU for more than 48 hours, out of which 4 had ENND. Regarding neonatal outcome, 31% stayed in NICU for less than 48 hours, and were discharged with mother because they had APGAR score 7 at 1 min and 10 at 5 minute.

Cord length was measured and found to be, 60 cm in 28%, 53 cm in 21%, 74 cm in 51% of patients. Longer length of cord (74 cm) was noticed mostly in patients who underwent emergency cesarean operation.

DISCUSSION

The pregnant women want to be informed about their pregnancy and they have high expectation about the safety of baby. The solution requires intensive observation and identification of the fetus who are at risk for this silent complication. Once identified, fetal heart rate monitoring, fetal behaviour monitoring in antenatal and intra partum period, maternal awareness of the problem will be the best way of achieving a live birth.

In this study, different changes in fetal movements, fetal heart pattern, distress associated with cord around neck, like hypoxia,

passage of meconium in labour, prolonged labour have been mentioned. Different ways to detect cord around neck in antenatal period and in labour have been mentioned. We also concluded that cord around neck is associated with fetal and neonatal complications but can be reduced with vigilant monitoring. Same observation was made by Rhoades et al¹⁰.

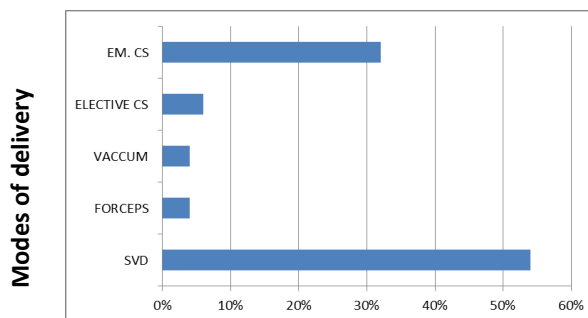
Wang CC in Feb 1997 studied the relation between cord entanglement around the fetal neck and umbilical arterial measures of free oxygen radical activity at birth¹¹. and concluded that tight nuchal cord was associated with decreased lipid peroxide level and increased oxygen free radical activity but loose nuchal cord had less adverse effects¹².

No morbidity like cerebral palsy (CP) was seen in current study but other studies concluded that nuchal cord causes progressive hypoxia and hypercapnia therefore causing effective birth asphyxia leading to cerebral palsy with incidence of 2/1000 due to intra partum events^{10,13,14}. They also showed that about 9 percent of children were thought to have CP directly and exclusively related to asphyxia at delivery. Modern prenatal care and improved obstetric care have significantly reduced the incidence of birth injury, but it is unlikely that it will ever be completely eliminated¹³.

In our study, 11% of patients had high head at term with cord around neck (table-1). Result was close to another study showing that cord around neck was one of cause of high presenting part, prolonged labour or dystocia. These finding was observed in 15% to 30% of nuchal cord deliveries⁹. In our study, total cases of fetal distress and meconium were 15% and 5% respectively (Table 1), almost compatible to two other studies (14.47%) and 9.2%¹⁶.

Nuchal cord's associated complications like meconium and fetal compromise have been reported by others authors¹⁷. In our study thirty two (32%) and six (6%) patients underwent emergency and elective caesarean section respectively to minimize the complication with

cord around neck (fig-1). Dhar et al found the incidence of LCSC in 27.2% of case with tight nuchal cord and 15.7% with loose nuchal cord¹³.



Maternal outcome in patients with cord around neck

EM-CS: Emergency casaarean section, SVD: Spontaneous vaginal delivery

Figure-1: Maternal outcome in term of mode of delivery in patients with cord around neck.

Table-1: Description of fetal and neonatal complications in patients diagnosed in labour (n=28).

Fetal Complications	Relative frequency
Fetal distress	15%
Stillbirth	3%
Meconium	5%
Intrauterine death	1%
Neonatal complication	
ENND (early neonatal deaths)	4%

In another study, this incidence was 13.81%¹⁵.

Longer cords tend to become looped around neck. Nuchal coiling can occur in shorter cords, in which the cord tends to be more tightly wrapped around the infants 's neck¹⁸. In our study 51% patients had long cord measuring up to 74 cm, most of these patients underwent cesarean section. The collaborative project, a national study of over 55,000 pregnancies, concluded that long cords are associated with fetal entanglement. The key here is to understand that entanglement depends on fetal repositioning in the uterus¹⁹. In process of repositioning it becomes cord entangled, ends up into resistance to movement

or the consequences of disturbed blood flow, oxygenation, and urgent delivery¹⁹.

It is important for the mother to maintain fetal kick count chart to recognize when the fetus plays and when it sleeps. These activities should remain similar from 32 weeks until 40 weeks. Decreased, jerky and weaker fetal movements over time suggest fetal stress and should alert the mother to see her physician²⁰. These warning signs of probable fetal entanglement or placental insertion and location abnormalities should motivate the physician and mother to begin a surveillance plan, especially prior to 40 weeks. Maintenance of fetal kick count chart has definitely reduced the rate of stillbirth in developed countries²⁰. All changes in fetal behaviour noted by the mother or the physician should be shared with each other²⁰.

Stillbirth is the worst result of antenatal care for the obstetrician and creates tremendous grief with parents in the knowledge that they have lost a baby with full potentials for later life¹². With an estimated 4,000 deaths per year from umbilical cord complications, an initial goal of 50% reduction is possible. Finally, defining the morbidity of cord compression is the next major goal¹².

CONCLUSION

Cord around neck can be delivered vaginally if monitored carefully but associated with complication. Immediate action in case of complication, is required to get good maternal and fetal outcome and to avoid morbidity and mortality with cord around neck.

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