ORIGINAL ARTICLE

Cord Around Neck and its Fetal Implication

FARUKH BASHIR[1], ZILL-E-HUMA[2], PAKEEZA ASLAM[3], *RIZWANA NAZ*[4]

ABSTRACT

Objective: To compare fetal outcome of cases having nuchal cord and those without nuchal cord.
Methodology: This is a observational (Analytical study), was carried out in the department of Obstetrics and Gynaecology Unit-IV Fatima Jinnah Medical College/Sir Ganga Ram Hospital, Lahore over a period of six months (08-09-2007 to 08-03-2008). 100 pregnant women, 50 with nuchal cord and 50 without nuchal cord were included in study. Data was compiled, transferred and analyzed accordingly through SPSS version 12.0.
Results: Majority of the pregnant women belong to the age group i.e., (25-29) from both with and without nuchal cord. Every outcome was alive & healthy in both with or without nuchal cord. So there is no significant difference between the outcome of babies with and without nuchal cord. The results from chi-square suggest there is insignificant association between mode of delivery and groups (P>0.05).
Conclusion: There is no significant difference between the baby outcome having nuchal cord and without nuchal cord.
Keywords: Nuchal cord, ultrasonography, fetal outcome

INTRODUCTION

Nuchal cord is the encirclement of umbilical cord around the fetal neck. Umbilical cord can encircle any part of the fetal body but usually neck is the most common site. It results from the movements of the fetus through a loop of the umbilical cord[1]. Nuchal cord can be one circle to many. The maximum number of encirclements can be even up to eight[2]. Nuchal cord is an incidental finding in routine second and third trimester ultrasound scans.[3] In cases of cord around the neck, single encirclement is reported to be in ninety percent and multiple encirclements in ten percent[4]. The incidence of nuchal cord in term and post term deliveries was 33.7% and 35.1% respectively. Multiple nuchal cords were present in 5.8% of term and 5.5% of post term deliveries[5]. The diagnosis of nuchal cord and its effect on blood flow can help to predict cord compression and fetal birth weight. Patients having abnormal umbilical artery blood flow indices were more likely to have poor APGAR scores, the increased rate of birth asphyxia or hypoglycemia. These babies are at times likely to be admitted to newborn nursery unit (NICU) and were smaller in all body proportions than those with normal umbilical artery blood flow[6]. Decreased umbilical blood flow also causes growth retardation in fetus.[7] There were no significant differences, in the mean birth weight, the frequency of non-reassuring fetal heart patterns, operative vaginal deliveries or 5 minutes APGAR score of <7. The Caesarean delivery rates were significantly different among nuchal cord or no-nuchal cord around the neck[8].

Extensive studies regarding effects of nuchal cord have been conducted in developed countries. According to some studies, nuchal cord was associated with adverse fetal outcome like fetal distress, variable fetal heart rate decelerations, preterm deliveries, low birth weight etc, and rarely perinatal mortality. But, in some studies no association was found between nuchal cord and perinatal complications. Pakistan is a developing country and very few studies have been conducted on this topic. In order to fill in this gap, I have opted for this study. Present study will help to evaluate effects of nuchal cord among Pakistani pregnant women and this will help obstetrician in the proper decision of mode and time of delivery and to assess the need for timely intervention to avoid complications.

METHODOLOGY

This is a observational (analytical study) was carried out at Department of Obstetrics and Gynaecology, Fatima Jinnah Medical College, Sir Ganga Ram Hospital Lahore for six months (8-9-2007 to 8-3-2008). Hundred pregnant women, fifty with nucal cord and fifty without nuchal cord diagnosed on Doppler ultrasonography will be selected from OPD emergency of Sir Ganga Ram Hospital Lahore with non-probability purposive sampling technique. Patients with third trimester pregnancy and singleton cephalic presentation were included. Patients

[1,2,4]Departments of Obs/Gynae, Sir Ganga Ram Hospital Lahore, [3]CMH, Lahore Medical College, Lahore.
Correspondence to Dr. Farukh Bashir email: dr.farrukhawan@yahoo.com

suffering from chronic diseases like diabetes, hypertension or delivered by cesarean section for causes other than nuchal cord were excluded. The cases will undergo routine investigations like blood picture, urine analysis and clotting profiles. All the cases will be followed for fetal outcome including mode of delivery, birth weight, APGAR scores at one minute and five minute, need for NICU admission and neonatal mortality. The data was entered into SPSS version 12 and analyzed. Variables in both groups were compared by using T test and Chi- square test. P less than or equal to 0.05 was taken as significant.

RESULTS

In order to find the significant age group of pregnant women, age was grouped into four different groups. It was found that 14(26%), 22(44%) and 14(28%) women came with no nuchal cord. Similarly the count and percentages for women with nuchal cord were found as 12(24%), 23(46%), 14(28%), and 1(2%). Thus results indicate that majority of the pregnant women belong to the age group (25-29) from both with and without nuchal cord. It was found that mean age with standard deviation (26.68±4.192) in patients with nuchal cord while 27.02±3.987 in no nuchal cord patients. There is no significant (P>0.05) difference between ages of two groups (Table 1). It was noted that the average baby weight for no nuchal cord was 2.788±0.658kg and nuchal cord was 2.932±0.5044kg. Statistically no significant (P>0.05) difference was found (Table 2).

Ultrasound findings showed that fetal weight of nuchal cord were 2(4%), 10(20%), 28(56%) and 10(20%) respectively. Similarly patients without nuchal cord were 4(8%), 4(8%), 12(24%), 16(32%) and 14(28%) respectively. Among these groups most of the fetal weight lies in group (2.6-3kg). The mean weight of babies with and without nuchal cord were 2.67±0.65 and 2.81±0.45 respectively (Table 3). Table 4 showed that biparietal diameter in nuchal cord was found 0(0%), 0(0%), 8(16%), and 42(84%). Similarly patients without nuchal cord were 1(2%), 2(4%), 8(16%), 39(78%) respectively. Results indicate that mostly patients biparietal diameter lies in group (8.1-8.5).The mean age of biparietal diameter in both with and without nuchal cord were 8.808±0.5170 and 8.978±0.358 respectively. Statistically the results results were insignificant (P>0.05).

Femur length for both patients with and without nuchal cord was divided into three different groups. It was found that patient with nuchal cord have count and percentages in different groups as 0(0%), 0(0%), 50(100%) respectively. Similarly patients without nuchal cord were 1(2%), 4(8%), 45(90%) respectively. The mean for with and without nuchal cord was found 6.652±1.074 and 7.130±0.259. Statistically the different was significant (P<0.50) (Table 5). It can be seen that every outcome was alive and healthy in both patients with or without nuchal cord. So there is no significant difference between the outcome of babies with and without nuchal cord (Table 6). Table 7 showed the count and percentages of mode of delivery were calculated for the patients with and without nuchal cord. It was found that 3(6%), 2(4%), 1(2%) and 44(88%) have LSCS, NVD, outlet forcep, SVD respectively with no nuchal cord. Similarly with nuchal cord it was found as 10(20%), 1(2%) 39(78%). There is insignificant association between mod of delivery and groups (P>0.05). The liquor were calculated for overall patients and found that 94%, 1%, and 5% females have adequate, excessive, and scanty liquor (Table 8).

Table 1: Frequency of mother's age in both groups (n=100)

Age groups (years)	No nuchal cord (n=50)	Nuchal cord (n=50)
19 – 24	14 (28%)	12 (24%)
25 – 29	22 (44%)	23 (46%)
30 – 34	14 (28%)	14 (28%)
>34	-	1 (2%)

Table 2: Frequency of baby birth weight in both groups (n = 100)

Baby birth weight (kg)	No nuchal cord (n=50)	Nuchal cord (n=50)
1 – 1.5	3(6%)	2 (4%)
1.6 – 2.0	6(12%)	1 (2%)
2.1 – 2.5	10 (20%)	6 (12%)
2.6 – 3.0	15 (30%)	27 (54%)
3.1 – 3.5	13 (26%)	10 (20%)
> 3.5	3 (6%)	4 (8%)

Table 3: Frequency of fetal weight in both groups (n=100)

Fetal weight (kg)	No nuchal cord (n=50)	Nuchal cord (n=50)
1 – 1.5	4 (8%)	2 (4%)
1.6 – 2.0	4 (8%)	-
2.1 – 2.5	12 (24%)	10 (20%)
2.6 – 3.0	16 (32%)	28 (56%)
>3.1	14 (%)28	10 (20%)

Table 4: Frequency of biparietal diameter in both groups (n=100)

Biparietal diameter (cm)	No nuchal cord (n=50)	Nuchal cord (n=50)
6.5 – 7.0	1 (2%)	-
7.1 – 7.5	2 (4%)	-
7.6 – 8.0	8 (16%)	8 (16%)
8.1 – 8.5	39 (78%)	42 (84%)

Table 5: Frequency of femur length in both groups (n=100)

Femur length (cm)	No nuchal cord (n=50)	Nuchal cord (n=50)
1.5 – 3.5	1 (2%)	-
3.6 – 5.4	4 (8%)	-
5.5 – 7.4	45 (90%)	50 (100%)

Table 6: Frequency of fetal outcome in both groups (n=100)

Fetal outcome	No Nuchal cord	Nuchal cord
Alive and healthy	50(50%)	50(50%)

Table 7: Frequency of mode of delivery in both groups (n=100)

Mode of delivery	No nuchal cord (n=50)	Nuchal cord (n=50)
LSCS	3 (6%)	10 (20%)
NVD	2 (4%)	1 (2%)
Out forceps	1 (2%)	-
SVD	44 (88%)	39 (78%)

Table 8: Frequency of liquor in both groups (n=100)

Liquor	Frequency	Percentage
Adequate	94	94
Excessive	1	1
Scanty	5	15

DISCUSSION

Nuchal cord is common umbilical cord accident and up to 25% of babies are born with the umbilical cord wrapped one or more times around their neck. This rarely causes any problem and babies with nuchal loops are generally healthy. Single umbilical cord nuchal loops are encountered in 20 to 33% of normal term pregnancies. Accordingly entanglement increases linearly from 5.8% at 20 weeks to 29% at 42 weeks. Multiple loops occur in fewer than 2 per 1000 cases. It is considered normal variation and does not affect pregnancy outcome of fetal weight at birth. Nuchal cord can be detected using color Doppler ultrasound, with a sensitivity of over 90% after 36 weeks of gestation. There are two types of nuchal cord. Type A nuchal loop that encircles the neck in a freely sliding pattern and Type B nuchal loop that encircle the neck in a lock pattern. According to Eyal Sheinar and collegues in 2006 in a retrospective population based study concluded that nuchal cord is not associated with adverse perinatal outcome. The results are comparable with this study[9]. In August 2005, Jauniuax and colegues[10] describe that no significant increase in caesarean deliveries was associated with nuchal cord and condition did not predict low APGAR scors, admission to a neonatal intensive care unit, or the cord arterial PH. Results are comparable with this study. Sareshtha and colleagues[11] in June 2007 stated that there were significant differences in the rates of neonatal intensive care requirement and five minutes APGAR scores between pregnancies with and without nuchal cord entanglement results are comparable with the studied.

Mastrobattria and his colleagues[12] concluded in 2005 and Carey[13] also studied that there were no significant differences in the mean birth weight, the frequency of non-reassuring fetal heart rate pattern, operative vaginal deliveries and five minute APGAR Scores of less than 7. The cesarean delivery rate was higher in non-nuchal cord group. So a nuchal cord at term is not associated with untoward pregnancy outcome. Sometime fetal monitoring shows heart rate abnormalities during labour and delivery in babies with nuchal loops. This may reflect pressure on the cord, however the pressure is rarely serious enough to cause death or any lasting problems though occasionally a caesarean delivery may be needed. Less frequently the umbilical cord become wrapped around other part of the baby's body such as foot or hand. Generally this does not harm the baby. Another study was carried out by Gonzalez-Quoinpero et al[14] on nuchal cord which shows same results. A total of 233 patients were included of which 118 had sonographically detected nuchal cord. Statistically there was no significant difference between patients with sonographically detected nuchal cord and control patients with respect to maternal age, estimated gestational age at sonography, method of delivery. Pritchard and colleagues[15] found no difference in mode of deliveries with and without nuchal cord. Larson et al[16] and Larson et al[17] and Adinma[18] studied cord entanglement and fetal outcome .Results are comparable. Rhoades et al[19] and Begum and colleagues[21] gave same results that cord around fetal neck doesn't affect fetal outcome in terms of mode of delivery, birth weight, APGAR score and admission to neonatal intensive care unit. Schaffer and colleagues[20] in 2005 gave no effect of nuchal cord in fetal outcome in term and post term deliveries. All these studies indicate that although they were performed in different social groups and in a different geographical location but results prevail universally.

CONCLUSION

There is no significant difference between the baby outcomes having nuchal cord or without nuchal cord.

REFERENCES

1. Kale A, Akdennitz S, Rdemoglu Kl. The incidence of nuchal cord at delivery and its effects at the perinatal outcome. Perinatal J 2006; 14:83-9.
2. Collins JH, Collins CL, Weckwerth SR, De Angelis L. Nuchal cords: timing of prenatal diagnosis and duration. Am J Obstet Gynecol 1995;173:768.

3. Aksoy U. Prenatal colour Doppler sonographic evauation of nuchal encirclement by the umblical cord. J Clin Ultrasound 2003;31;473-7.
4. Sherer DM, Sokolovski, Dalloul M, Khoury-Collado F, Abulafia O. Is fetal cerebral vascular resistance affected by the presence of nuchal cords in the third trimester of pregnancy?. Ultrasound Obs Gynecol 2005; 25:454-8.
5. Schaffer L, Burkhardi T, Zimmerman R, Kurmanavicius J. Nucal cords in term and post term deliveries: do we need to know?. Obstet Gynecol 2005:106:23-8.
6. Rana MJ, Amanullah A, Farooq O. The role of umbilical artery Doppler in detection and management of fetal growth retardation. Biomedica 2005; 21:4-7.
7. Khan DBA, Bari V. Chishti IA. Ultrasound in diagnosis and management of intrauterine growth retardation. J Coll Physician Surg Pak 2004; 14:6014.
8. Chohan A. Fundamentals of obstetrics. 1st ed. Lahore: 2005:349.
9. Sheiner E, Abramowicz JS, Levy A, Silberstein T, Mazor M, Hershkovitz R. Nuchal cord is not associated with adverse perinatal outcome. Arch Gynecol Obstet 2006;274(2):81-3.
10. Peregrine E, O'Brian P, Jauniaux E. Ultrasound detection of nuchal cord prior to labour induction and the risk of cesarean section. Ultrasound Obstet Gynecol 2005; 25:160-4.
11. Shrestha NS, Singh N. Nuchal cord and perinatal outcome. Khatmandu University Med Coll J 2007;5:360-3.
12. Mastrobattista JM, Hollier LM, Yeomans ER, et al. Effects of nuchal cord on birth weight and immediate neonatal outcomes. Am J Perinatal 2005;22(2):83-5,
13. Carey JC, Rayburn WF. Nuchal cord encirclements and birth weight. Departments of Obstetrics and Gynecology, University of Oklahoma College of Medicine, Oklahoma City, USA. 2008.
14. Gonzalez-Quintero VH, Tolaymat l, Muller AC, Izqierdo L, O'Sullivan MJ, Martin D. Outcomes of pregnancy with sonographically detected nuchal cord remote from delivery. J Ultrasound Med 2004;23:43-7.
15. Pritchard JA, McDonald PC, Gant NF. Conduct of normal labour and delivery.William Obstetrics. 17th ed. Norwalk: Appleton-Century Crofts, 1895; 340.
16. Larson JD, Rayburn WF, Harlan VL. Nuchal cord entanglement and gestational age. Am J Perinatol 1997; 14:555-7.
17. Larson JD, Rayborn WF, Crosby S, Thurnau GR. Multiple nuchal entanglements and intrapartum complications. Am J Obs Gynecol 1995; 173: 1228-31.
18. Adinma JI.Effect of Cord entanglement on Pregnancyoutcome. Intl J Obs Gyneacol 1990; 32(1):15-8.
19. Rhoades DA, Latza V, Muller BA. Risk factors and outcomes associated with nuchal cord: a population based study. Edu J Reprod Med 1999;44(1):39-45.
20. Schaffer L, Barkhardt T, Zimmermann R, Karmanavicious J. Nuchal cords in terms and post term deliveries. Do you need to know? Obs Gynecol 2005;106:23-28.
21. Begum AA, Sultana H, Hasan R, Ahmed M. Conditions behind fetal distress. JAFMC Bangladesh 2011; 7(1): 25-7.