

PERINATAL OUTCOME OF NUCHAL CORD

Farnaz Zahoor¹, Zakia Minhas², Adil Zaki³

ABSTRACT

Objective: To find out the perinatal outcome in cases of vaginal delivery with nuchal cord versus babies delivered by elective caesarian section with nuchal cord.

Methodology: A retrospective, cross-sectional, comparative study done between January to December 2011 at Kalsoom Maternity Hospital where 1776 patients were analyzed for presence of nuchal cord prior to and at the time of delivery and perinatal outcome. The cases with nuchal cord undergoing vaginal delivery were 205 (study group) versus 85 elective caesarian section with nuchal cord served as control group. Outcome variables between the two groups were compared.

Results: Incidence of nuchal cord was 16.3%. Incidence of single nuchal cord was highest in normal delivery (73.9%). No significant difference was found between the mean of both 1- and 5-minute Apgar scores (8 and 10, respectively) between the two groups, but infants born with nuchal cords vaginally, tended to have lower scores at 1 minute ($p=0.008$). This trend was not evident in the 5-minute Apgar test. Two neonatal admission were done (in vaginal delivery group) for 24 hour and then discharged for babies with apgar score 3/10, 5/10 and 4/10, 6/10 respectively. Elective caesarian section cause an additional morbidity and does not justify in case of nuchal cord as outcome is almost same in both condition.

Conclusion: Nuchal cord is not associated with adverse perinatal outcome therefore do not influence clinical management. Doing elective section is not justified as there is no difference in perinatal outcome.

Key Words: Nuchal cord, Perinatal outcome, Apgar score, caesarian section

This article may be cited as: Zahoor F, Minhas Z, Zaki A. Perinatal outcome of nuchal cord. J Postgrad Med Inst 2013;27(2):174-8.

INTRODUCTION

In condition of nuchal cord, umbilical cord is wound around fetal neck of fetus. The prevalence of nuchal cord at delivery is extremely high with a single loop reported in around the 30% of neonates¹ It is believed by most obstetricians to be the cause of unexplained fetal distress or perinatal death but this is not true and such effects may have been attributed to other conditions.

However, whether or not nuchal cords are associated with significantly increased adverse perinatal outcome is debated. Studies of outcomes after nuchal cord in singleton pregnancies

delivering term have reached conflicting conclusions. Some authors²⁻⁴ reported that the nuchal cord is associated with an increased risk of fetal distress, meconium- stained amniotic fluid and lower Apgar score whereas others did not^{5,6} find an increased frequency of non reassuring fetal heart rate patterns, operative vaginal delivery and low Apgar score in cases with nuchal cord. Ogueh et al reported umbilical cord nuchal loops are associated with induction of labor, slow progress of labor, and shoulder dystocia⁷.

Sheiner et al⁸ reported a higher rate of labour induction and not reassuring fetal heart pattern, but no significant association with perinatal mortality or caesarean section.

Does the nuchal cord really affect the outcome of delivery?. This retrospective study investigated the actual frequency of nuchal cord encountered and determined the effect, if any of a nuchal cord on an infant as it passes through the birth canal and immediately after delivery.

METHODOLOGY

A retrospective comparative study done at Kalsoom Maternity Hospital between January to December 2011. A review of the labor records showed that 1776 infants were born at Kalsoom

¹⁻³Department of Obstetrics & Gynaecology, Kalsoom Maternity Hospital Peshawar - Pakistan

Address for Correspondence:

Dr. Farnaz Zahoor,

Department of Obstetrics & Gynaecology, Kalsoom Maternity Hospital Peshawar - Pakistan

E-mail: farnaz_1410@hotmail.com

Date Received: May 10, 2012

Date Revised: November 12, 2012

Date Accepted: January 10, 2013

Maternity Hospital during the mentioned period. Demographic data on the mother were collected from a review of the prenatal record, and included age, parity, previous personal and obstetric history. The maternal delivery record provided the data for gestational age, method of delivery, presence of meconium in the amniotic fluid, fetal heart rate monitoring that was done routinely, presence of nuchal cord, number of cords, instrumental delivery and any other complications that may have occurred at the time of delivery. The newborn's record was used to collect data for sex, birthweight, Apgar scores, congenital anomalies, any admission to neonatal unit and perinatal course.

Of the 1776 vaginal deliveries, 205 were selected as study group. The inclusion criteria was pregnancies with singleton normal cephalic pregnancy between 37 and 41 completed weeks with cord around neck at time of delivery. The remaining were excluded from the study after following exclusion criteria which included preterm, congenital abnormalities and noncephalic presentation and postdate pregnancies. Eighty five patients were in control group included patients diagnosed at term to have cord around neck opted to undergo elective c/section without any

additional risk factor. Statistical analysis were performed using chi-square with Yates' correction factor or Fisher's exact test on nominal data, and Student's t test for independent samples on interval data.

RESULTS

Incidence of nuchal cord in this study was 16.3%. Incidence of single nuchal cord was highest in normal delivery (73.9%). There was no significant difference found between the mean of both the 1- and 5-minute Apgar scores (8 and 10, respectively) between the two groups, but infants born with nuchal cords undergoing vaginal trial tended to have lower scores at 1 minute (p=0.008) Table 1. This trend was not evident in the 5-minute Apgar test. Two neonatal admission were done for 24 hour in vaginal delivery group and then discharged for babies with apgar score 3/10, 5/10 and 4/10, 6/10 respectively. Six patients had meconium stained liquor which was managed by intrauterine wash with normal saline and all these babies had ≥ 7 apgar at 1 minute. An observation made, which was although not objective of study that, as the number of cords around neck increased the apgar score < 7 at 5min increased progressively Table 2. There is no significant association

Table 1: Apgar score in cases of Normal Vaginal Delivery and Caesarian Section

		Mode of Delivery		
		Normal Vaginal Delivery	Caesarian Section	
Apgar Score at 1 minute	< 7	Count	33	4
		% within Mode of Delivery	16.1%	4.7%
	≥ 7	Count	172	81
		% within Mode of Delivery	83.9%	95.3%
Total	Count	205	85	
	% within Mode of Delivery	100.0%	100.0%	

Table 2: Relationship of number of cord around neck in Normal Vaginal Delivery and Apgar score

			Apgar Score		Total
			< 7	≥ 7	
Number of Cord around Neck	Single	Count	25	139	164
		% within Number of Cord around Neck	15.2%	84.8%	100.0%
	Double	Count	7	30	37
		% within Number of Cord around Neck	18.9%	81.1%	100.0%
	Multiple	Count	1	3	4
		% within Number of Cord around Neck	25.0%	75.0%	100.0%
Total		Count	33	172	205
		% within Number of Cord around Neck	16.1%	83.9%	100.0%

Table 3: Relationship of various maternal and fetal parameters on different mode of delivery

	Mode of Delivery	n	Mean	Standard Deviation	p-value
Gestational Age	*Normal	205	38.1171	1.17821	.465
	Caesarian	85	38.2235	.99255	
Weight of Baby	*Normal	205	7.2059	1.03463	.520
	Caesarian	85	7.1235	.87078	
Apgar score	*Normal	205	7.6293	1.09773	.019
	Caesarian	85	7.9176	.38458	
Number of Cord around Neck	*Normal	205	1.2195	.45976	.016
	Caesarian	85	1.3765	.59715	
Parity	*Normal	205	1.4878	1.63482	.938
	Caesarian	85	1.4706	1.86182	

*Normal = Normal Vaginal Delivery

Table 4: Comparison of fetal outcome in both the groups

		Mode of Delivery				p-value
		Normal Vaginal Delivery		Caesarian Section		
		n	%	n	%	
Meconium	No meconium	199	97.1%	85	100.0%	0.281
	msl 1	4	2.0%	0	.0%	
	msl 2	2	1.0%	0	.0%	
	msl 3	0	.0%	0	.0%	
NICU Admission	No	202	98.5%	85	100.0%	0.262
	Yes	3	1.5%	0	.0%	
Apgar score	≤ 7.00	33	16.1%	4	4.7%	0.008
	> 7.00	172	83.9%	81	95.3%	

between number of cord and parity, gestational age and weight of baby Table 3. Elective section cause an additional morbidity and does not justify in case of nuchal cord as outcome is almost same in both condition. Comparison between the different fetal outcome measures in two group is showed in Table 4. Since vaginal delivery has no significant morbidity on fetus so elective section is not justified.

DISCUSSION

The frequency of nuchal cords found in this study is 16.3%, which is similar to findings in prior studies, the incidence varies from 12.6% to 33.3%, with an overall average of 20.4%⁹. Thus, nuchal cords commonly occur.

During the study, various observations were made, although it was not the objective of study, that there was no association between nuchal cords and maternal age and parity. There

was no indication that the presence of a nuchal cord influences the length of the pregnancy, a finding that agrees with other reports¹⁰⁻¹³. Nuchal cord was seen in boys more (55.2% in boys vs. 44.8% in girls) similar to another study¹⁰ but there was no significant association with nuchal cords.

The presence of a nuchal cord in this study was not associated with an increased frequency of vacuum or forceps deliveries. About 9% had vacuum delivery and 2% forcep delivery for case group. Thus, operative deliveries were not more common in those pregnancies involving nuchal cords, although this is controversial in the literature^{10,12,14}.

The presence of a nuchal cord is often cited as a major cause of fetal distress, as evidenced by meconium stained amniotic fluid and/or fetal bradycardia or tachycardia^{10,13,15}. In a study by Fisher¹⁶, fetal distress was twice as

common in births complicated by nuchal cords which is reverse of Spellacy et al¹³ stated that the incidence of meconium is not increased by nuchal cords. In this study only 4.3% had meconium and none of them had bradycardia or tachycardia. The meconium staining of liquor in this study was managed by intrauterine wash with normal saline with 5 minute apgar score at birth >7.

The present study was unable to demonstrate a significant difference in the mean 1-minute Apgar score between the two groups, although the nuchal cord group did tend to have a larger percentage of infants (16.1%) born with a score of less than 7. This difference was absent at 5 minutes after birth when the second Apgar score was given, suggesting that any possible effect is only transient. Similar findings by other suggest that nuchal cords are not a major cause of fetal asphyxia¹²⁻¹⁴.

Studies in the past have implicated nuchal cords as a cause of fetal death¹⁷. but several authors agree with the present study that nuchal cords do not increase fetal mortality^{10,12, 13,16}.

Shui and Eastman¹¹ found a higher fetal death rate in those deliveries not involving nuchal cords, and concluded that coiling of the umbilical cord around the infant's neck was a rare cause of perinatal death.

Doing cesarean section for solely nuchal cord when perinatal outcome is not affected, will only add additional morbidity to mothers health and increasing rate of section. The maternal mortality is higher than that associated with vaginal birth (5.9 for elective cesarean delivery v. 2.1 for vaginal birth, per 100 000 completed pregnancies¹⁸. Cesarean section also requires a longer recovery time, operative complications such as lacerations and bleeding^{19, 20}, future reproductive morbidity such as risk of placenta previa (5.2 per 1000 live births) and placental abruption (11.5 per 1000 live births)²¹.

Although elective caesarian may be opted by patients to avoid intrapartum complication of nuchal cord, what they don't realize is they are exposing babies to neonatal complications like the risk of neonatal respiratory distress necessitating oxygen therapy is higher if delivery is by cesarean (35.5 with a pre labour cesarean v. 5.3 with vaginal delivery, per 1000 live births)²². In this study there were 4.7% babies delivered by c section with 1 minute apgar score <7 (table 1). Thus one cannot be certain that elective c section is going to give good apgar score at 1min every time.

Also, a recent study has reported that the risk of unexplained stillbirth in a second

pregnancy is somewhat increased if the first birth was by cesarean rather than by vaginal delivery (1.2 per 1000 vs. 0.5 per 1000)²³. WHO indicated that a caesarean section rate greater than 10-15% is not justified in any region of the world. In this study rate of elective section for nuchal cord is 4.7%, by reducing this rate we can reduce total incidence of c section.

CONCLUSION

This study suggests that nuchal cords occur commonly, but are rarely associated with significant neonatal morbidity or mortality. Doing elective cesarean section in such cases only increases maternal morbidity without significant difference in neonatal outcome.

REFERENCE

1. Clapp JF, Stepanchak W, Hashimoto K, Ehrenberg H, Lopez B. The natural history of antenatal nuchal cords. *Am J Obstet Gynecol* 2003;189:488-93
2. Rhoades DA, Latza U, Mueller BA. Risk factors and outcomes associated with nuchal cord. A population-based study. *J Reprod Med* 1999;44:39-45.
3. Clapp JF, Lopez B, Simonean S. Nuchal cord and neurodevelopmental performance at 1 year. *J Soc Gynecol Investig* 1999;6:268-72.
4. Assimakopoulos E, Zafrakas M, Garmiris P, Goulis DG, Athanasiadis AP, Dragoumis K, et al. Nuchal cord detected by ultrasound at term is associated with mode of delivery and perinatal outcome. *Eur J Obstet Gynecol Rep Biol* 2005;123:188-92.
5. Mastrobattista JM, Hollier LM, Yeomans ER, Ramin SM, Day MC, Sosa A, et al. Effects of nuchal cord on birthweight and immediate neonatal outcomes. *Am J Perinatol* 2005;22: 83-55.
6. Gonzalez-Quintero VH, Tolaymat L, Muller AC, Izquierdo L, O'Sullivan MJ, Martin D. Outcomes of pregnancies with sonographically detected nuchal cords remote from delivery. *J Ultrasound Med* 2004;23:43-7.
7. Ogueh O, Al-Tarkait A, Vallerand D, Rouah F, Morin L, Benjamin A, et al. Obstetrical factors related to nuchal cord. *Acta Obstet Gynecol Scand* 2006;85:810-4.
8. 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;274:81-3.

9. Shepherd AJ, Richardson CJ, Brown JP. Nuchal cord as a cause of neonatal anemia. *Am J Dis Child* 1985;139:71-3.
10. Dippel AL. Maligned umbilical cord entanglements. *Am J Obstet Gynecol* 1964;88:1012-9.
11. Shui KP, Eastman NJ. Coiling of the umbilical cord around the foetal neck. *J Obstet Gynaecol Br Emp* 1957;64:227-8.
12. Horwitz ST, Finn WF, Mastrota VF. A study of umbilical cord encirclement. *Am J Obstet Gynecol* 1964;89:970-4.
13. Spellacy WN, Gravem H, Fisch RO. The umbilical cord complications of true knots, nuchal coils, and cords around the body. *Am J Obstet Gynecol* 1966;94:1136-42.
14. Weber T. The influence of cord complications on fetal pH, neonatal Apgar scores, and the acid base state and oxygenation of the umbilical artery and vein. *J Perinat Med* 1981;9:134-9.
15. Mendez-Bauer C, Troxell RM, Roberts JE, Firman SM, Dubois JF, Menendez A, et al. A clinical test for diagnosing nuchal cords. *J Reprod Med* 1987;32:924-7.
16. Fisher EL. Cord entanglement and fetal prognosis. *Obstet Gynecol* 1964;23:608-10.
17. Bruce S, James SL, Bowe E, Rey H, Shamsi H. Umbilical cord complications as a cause of perinatal morbidity and mortality. *J Perinat Med* 1978;6:89-92.
18. Hall MH, Bewley S. Maternal mortality and mode of delivery. *Lancet* 1999;354:776.
19. Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR. Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. *Lancet* 2000;356:1375-83.
20. Bergholt T, Stenderup JK, Vedsted-Jakobsen A, Helm P, Lenstrup C. Intraoperative surgical complication during cesarean section: an observational study of the incidence and risk factors. *Acta Obstet Gynecol Scand* 2003;82:251-6.
21. Lydon-Rochelle M, Holt VL, Easterling TR, Martin DP. First-birth cesarean and placental abruption or previa at second birth. *Obstet Gynecol* 2001;97:765-9.
22. Morrison JJ, Rennie JM, Milton PJ. Neonatal respiratory morbidity and mode of delivery at term: influence of timing of elective caesarean section. *Br J Obstet Gynaecol* 1995;102:101-6.
23. Smith GC, Pell JP, Dobbie R. Caesarean section and risk of unexplained stillbirth in subsequent pregnancy. *Lancet* 2003;362:1179-84.

CONTRIBUTORS

FZ conceived the idea & planned the study. ZM supervised the study. AZ helped in write up of the manuscript. All the authors contributed significantly to the research that resulted in the submitted manuscript.