SIGNIFICANCE OF CORD PROBLEMS AT BIRTH

S. Kumari
A. Saxena
D. Monga
A. Malik
M. Kabra
R.M. Kurray

ABSTRACT

Cord problems at birth were prospectively studied in 12,000 singleton deliveries, of which 258 (2.15%) babies had cord abnormalities. Nearly 32% of these cases had fetal distress and 20.5% had 1 minute Apgar score <6. Of the various cord problems nuchal cord was noted in 79.1%, cord prolapse in 12.4% and true knots in 3.9% cases. Perinatal mortality rate with cord problems was 85.27/1000 births. Neonatal problems noted were septicemia (4.56%), aspiration syndromes (13.48%), hypoxic ischemic encephalopathy (7.30%), neonatal convulsions (2.14%) and hyperbilirubinemia (2.14%). Although mean Hb and PCV were lower in those with cord round the neck as compared to normal controls, this difference was not significant. Seven babies had Hb <13 g/dl with nuchal cords. Neonates born with cord around the neck or with other cord abnormalities should be carefully followed up for morbidity.

Key words: *Cord problems, Nuchal cord, Perinatal outcome.*

From the Departments of Neonatology and Obstetrics, Lady Hardinge Medical College and Associated Hospitals, New Delhi 110 001.

Reprint requests: Dr. Sudarshan Kumari, 23B/6 P-2 Guru Gobind Singh Marg, New Delhi 110 005.

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Abnormalities of umbilical cord at birth, *e.g.*, nuchal cord, cord prolapse or cord accidents are known to be associated with adverse fetal outcome(1-4). It has been a mandatory obstetric practice to feel for nuchal cord in all deliveries, as the incidence of such an abnormality is reported to occur between 2 to 30% of all births(5-7). Most studies related to cord problems at birth have been limited to survival status of the fetus with little attention to neonatal morbidity(5-6). In the present study we describe our experience of various cord problems at birth and their effect on perinatal outcome and neonatal morbidity.

Material and Methods

Of 12,000 singleton deliveries during 1988 at Smt. Sucheta Kriplani Hospital, Delhi there were 258 births with cord problems, which included nuchal cords, accidental cord rupture, cord entanglements around body, cord prolapse and true knots and these formed the study group. Tight cord round the neck was defined as that which was not reducible prior to delivery of the neonate's body, and required early clamping and cutting to complete delivery. Loose cords were those that were reducible prior to delivery and its clamping and cutting did not differ from those neonates without nuchal cords.

All deliveries were attended by pediatric residents who recorded cord problems, birth weight, Apgar score and gestational age. The infants were followed up in the neonatal nursery or postnatal wards for morbidity with respect to pallor, abnormal neurological signs or other neonatal problems, till discharge from hospital or otherwise.

Hemoglobin and hematocrit determinations were done in 58 of these infants at

mean age 3.76±5.59 hours to determine the effect of loose or tight nuchal cords on hemoglobin level and these parameters were compared to normal control group with no cord problems. Neonates with blood group incompatibility, obvious blood loss, preterms, birth weight <2 kg or >3.5 kg, and those in whom maternal weight was <45 kg and Hb <10 g/dl were excluded for hematological study. The differences in hemoglobin and hematocrit between study and control group were determined by Student 't' test.

Results

Perinatal profile of 258 births with cord problems (*Table I*) revealed that fetal distress before delivery was noted in 31.8% of cases and 20.5% of live births and 1 minute Apgar score of <6. Various cord problems encountered are listed in *Table II*. Nuchal cords were noted in 79.1% of the study group. Of these in 25.4% of cases there were two or more loops of cord round the neck. Cord prolapse was recorded in 12.4% and true knots in 3.9%.

Delivery was by cesarean section in 56 subjects, fetal distress in 32.1% and cord prolapse/presentation in 21.4% of cases were the most frequent indications. Thirty per cent had birth weight <2.5 kg, which was similar to the distribution of all births during the study period. Of 13 stillbirths with cord problems, cord prolapse was noted in 9 and tight nuchal cord in 4. Ten

TABLE I—*Perinatal Profile of Study Group (n = 258)*

	Vertex	Breech	Compound	Transverse
Presentation	229	19	6	4
Birth weight (kg)	<1.5	1.5-2	2-2.5	2.5-3.0	>3.0
	7	26	57	111	57
Fetal distress	FHSNL	FHIR	MSAF	Apgar score <6
	6	27	50	54
	(2.4)	(10.4)	(19.0)	(20.5)
Pregnancy complications	Toxemia	Antepartum hemorrhage	Premature rupture of membrane	
	36	8	16	
	(13.9)	(3.9)	(6.1)	
Antenatal care	Booked		Unbooked	
	117		141	
	(45.3)		(54.7)	
Type of delivery	Vaginal		Cesarean	
	202		56	
	(78.3)		(21.7)	
Parity	Primi		Multi	
	94		164	
	(36.4)		(63.6)	

Figures in parentheses indicate percentage. FHIR = FH irregularity, FHSNL = Featal heart sounds not localized, MSAF = Meconium stained amniotic fluid.

TABLE II—*Cord Problems*

Problem	Number	%
Cord round neck	204	79.1
One loop	152	74.6
>2 loop	52	25.4
Cord prolapse	32	12.4
True knot	10	3.9
Cord presentation	5	1.9
Cord rupture	3	1.2
Velomentous insertion of cord	3	1.2
Cord round body	1	1.4

neonates in the study group died during neonatal period, all had low Apgar score (<6 at 1 min) and all deaths occurred at age <7 days, except one death at 18 days of age due to septicemia. Neonatal morbidity included septicemia (blood culture positive), aspiration syndromes, hypoxic ischemic encephalopathy, neonatal convulsions and hyperbilirubinemia in 4.56, 13.48, 7.30, 2.14 and 2.14% of cases, respectively.

Hemoglobin and packed cell volume were done in 58 study subjects and 63 controls (*Table III*). A slightly lower Hb and PCV was recorded in study group as compared to controls (differences not significant) and with loose cord than with tight nuchal cords, Anemia (Hb <13 g/dl) was noted in 7 babies, of which 4 had loose and 3 had tight nuchal cords. While all 4 babies with loose nuchal cord were asymptomatic, 2 of 3 with tight nuchal cords were symptomatic with pallor, tachycardia, low volume pulse and needed emergency blood transfusion.

Discussion

The incidence of umbilical cord problems as noted in the present study was 2.15%. Wide variations have been noted in incidence of cord problems at various centres, in Indian Council of Medical Research multicentric study ranging from 0.57% in Delhi to 17.47% from Calcutta(7). Earlier studies on cord involvement also observed an incidence between 2.5 to 3.0%. Abnormalities of cord presentation, entanglements or true knots may lead to fetal distress *in utero*, which was also noted in a third of cases in present study(2-5). The cesarean section rate was more in study subjects than the 12% cesarean rate for all hospital births.

The perinatal mortality rate was 85.27/1000 births in study group. Of 13 still

TABLE III—*Hemoglobin and Packed Cell Volume in Cord Problems and Control Group*

	Control	Loose cord	Tight cord	All babies with cord round neck
Number	63	38	20	58
Hemoglobin (g/dl)	16.82 ±1.91	16.32 ±1.75	16.58 ±2.11	16.41 ±1.94
PCV	51.28 ±7.07	49.13 ±7.33	49.17 ±7.33	49.42 ±7.6
Newborn with Hb <13 g/dl	–	4	3	7

No significant differences were noted between control and study group (Student 't' test p >0.05).

births, 9 occurred following cord prolapse and 4 with tight nuchal cord. Also, of the 10 neonatal deaths, tight nuchal cords were noted in 6, cord prolapse in 2 and true knot and a loose cord in one case each. Thus, tight nuchal cord was associated with a higher perinatal mortality than loose cords, due to progressive diminution of blood supply to fetus leading to stage of total acute asphyxia. This has been earlier reported by Adinma(6).

Cord problems may cause hypoxia and neonatal morbidity associated with them has not been recorded in earlier studies. Hypoxic encephalopathy and neonatal convulsions were recorded in 7.3 and 2.14% of babies with cord abnormalities. The incidence of convulsions during study period in our Institution was 0.7%. Neurological morbidity associated with cord problems has not been reported in earlier studies.

Till recently, neonatal anemia with nuchal cords had not been emphasized(8-11). This study shows a substantially increased prevalence of anemia in neonates with both tight and loose nuchal cords. The overall incidence of neonatal anemia as 12.1% in the present study is similar to 15.8% reported by Shepherd *et al.*(9). Neonates with tight nuchal cords can be deprived of upto 20% of their blood volume by feto-placental transfusion. The cord gets compressed as it encircles fetal neck, blood flow is hence obstructed in less muscular vein (*i.e.*, from placenta to fetus) while blood flow in more muscular arteries (*i.e.*, from fetus to placenta) remains less obstructed and fetus pumps blood to placenta. The degree of cord compression and time of onset determines magnitude of fetal blood loss, the anemia with loose nuchal cord is relatively less severe. It is concluded that abnormalities of umbilical cord at birth is a neonatal emergency and all these babies should be watched for neurological morbidity and anemia for first 48 hours of life.

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NOTES AND NEWS

XIII ANNUAL CONFERENCE OF U.P. CHAPTER OF INDIAN ACADEMY OF PEDIATRICS

The XIII Annual Conference of U.P. Chapter of Indian Academy of Pediatrics is to be held at Jawahar Lal Nehru Medical College, A.M.U., Aligarh on *14th April, 1992*. This will be preceded by a CME Programme on 13th April, 1992.

For further details, please contact:

Prof. S.H. Ahmad,
Chairman, Organizing Committee,
Department of Pediatrics,
J.N. Medical College,
A.M.U., Aligarh 202 002 (U.P.)
Tel: 29002 (Office)
29051 (Res.)

Dr. M. Ashraf Malik,
Organizing Secretary,
Department of Pediatrics,
J.N. Medical College,
A.M.U., Aligarh 202 002 (U.P.)
Tel: 29002 (Office)
21388 (Res.)