Research Paper Medical Science

Study of Morphology and Dimensions of Umbilical Cords in Normal and Anemic Mothers

Dr. Kalpana Purohit	Hind Institute of Medical Sciences, Mau, Ataria, Sitapur.
Dr. Durgesh Singh*	Hind Institute of Medical Sciences, Mau, Ataria, Sitapur.*Corresponding Author
Dr. Ankita Purohit	Hind Institute of Medical Sciences, Mau, Ataria, Sitapur.
Dr. Vipul Kant Singh	Hind Institute of Medical Sciences, Mau, Ataria, Sitapur.
Dr. Shashi Prabha Singh	Hind Institute of Medical Sciences, Mau, Ataria, Sitapur.

ABSTRACT *The outcome of fetus depends on the length and width of umbilical cord. Umbilical cord length and diameter vary in normal pregnancy and in pregnancy with maternal diseases. There are many studies of measurements of umbilical cord length and diameter with complication like gestational diabetes, IUGR, Rh Incompatibility etc. The present study is aimed to find correlation of the measurements of umbilical cord (length and diameter) in normal pregnancy & pregnancy complicated with anemia.*

KEYWORDS : Umbilical cord length, umbilical cord diameter, pregnancy, Anemia

INTRODUCTION

The developing fetus gets nutrients from the placenta through the Umbilical cord. Umbilical cord also carries the waste products from fetus to placenta 1. At term, the umbilical cord is fifty to sixty centimeters in length 2, the mean length of the umbilical cord is 55 cm and can be as long as 300 centimeters 3, a short cord is less than 35 cm in length3, 4. The average diameter is 1 – 2 cm2, 5. It contents three vessels, left umbilical vein, right and left umbilical arteries.

MATERIALS AND METHODS

The present study was conducted in the Department of Anatomy, Hind Institute of Medical Sciences, Mau, Ataria, Sitapur from October 2015 to April 2016. The placenta with umbilical cord was collected from the labor room and operation theater of Hind Institute of Medical Sciences, Mau, Ataria, Sitapur. The umbilical cord was cut leaving 5cm in the foetal side during delivery. The samples were collected from singleton pregnancies only. 72 samples were from normal pregnant women and 28 were from pregnant women with anemia whose Hb% was below 9gm%. The placenta with umbilical cord was preserved in 10% formalin. Umbilical cord length was measured with the help of thread and scale. The cord thickness was measured with Vernier calipers in millimeters.

FIGURE 1 SHOWING MEASUREMENT OF LENGTH OF UMBILICAL CORD

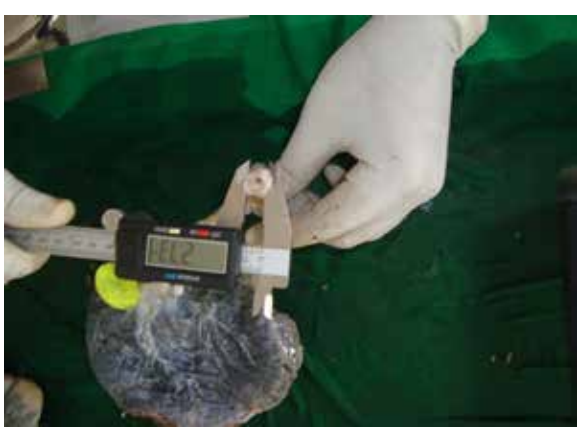


FIGURE 2 SHOWING MEASUREMENT OF DIAMETER OF UMBILICAL CORD

RESULT

In this study, in the anemic group (N=28) the maximum cord length was 59 cm and the minimum cord length is 26 cm. The mean cord length in this group is 28.17 ±4.30cm. In non-anemic or normal pregnancy (N=72) the maximum cord length found was 67 cm and the minimum length was 28 cm. The mean cord length is 33.04 ±8.48 cm .The mean cord length was found significantly higher in non - anemic group ($p<0.005$).

The maximum cord width in the anemic group (N=28) was 2.06cm and minimum was 1.05 cm. and the mean cord width was 1.47±0.29cm. In non-anemic or normal pregnancy (N=72) the maximum cord width was 2.6 cm and the minimum cord width was 1.04 cm and the mean cord width is 1.50 ±0.37 cm. The mean cord length was found significantly higher in non anemic group ($p<0.036$).

This suggests the length and thickness of the cord in the anemic group is less than the normal pregnancy group.

In the anemic group, in 2 cases there were 2 vessels in which the insertion of the cord was eccentric in the placenta.

In non-anemic or normal pregnancy (N=72) all the cords have 3 vessels except one in which there are 2 vessels and the cord position was central in the placenta.

The mean fetal weight in normal pregnancy group was 2.62 kg and in the anemic group was 2.32 kg.

The cord dimensions were compared between male and female babies. The length of the cord in normal pregnancy male babies (N=44) was a 34.04± 8.38cm & in anemic male babies (N=14) was 29.21 ±4.49 cm. Hence the length of the cord in normal pregnancy male babies was found significantly higher them anemic group (p<0.045). The width of the cord in the male babies was a 1.54 ±0.36 cm, 1.42 ±0.27 cm respectively in normal and anemic group. Hence the width of the cord in normal pregnancy male babies was found significantly higher than anemic group (p<0.27).

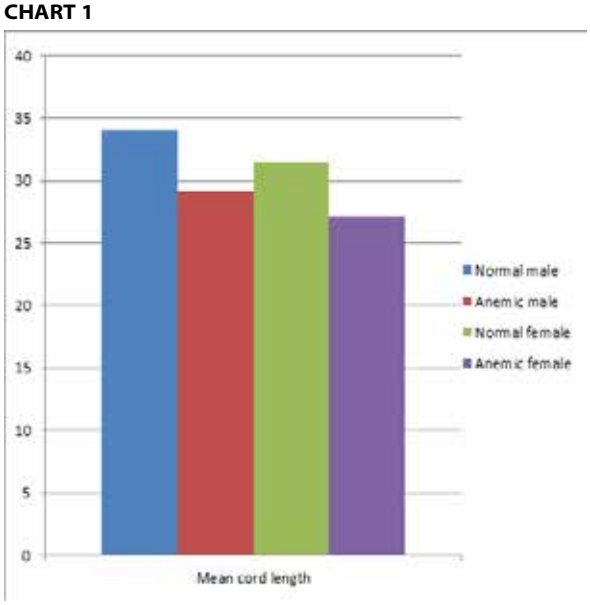
The length of the cord in the female babies in the normal pregnancy (N=28) was 31.46 ±8.55 cm, & 27.14 ±3.99 cm in the anemic group (N=14). Hence the length of the cord in normal pregnancy female babies was found significantly higher than anemic group (p<0.081).

The width of the cord in the female babies was 1.68±0.38 cm, 1.43 ±0.31cm in the normal and anemic group respectively. Hence the width of the cord in normal pregnancy female babies is more than the anemic female babies (p<0.04).

	Normal male	Normal female	Anemic male	Anemic female
Number of samples	44	28	14	14
Mean cord length with standard deviation	34.04±8.38	31.46±8.55	29.21±4.49	27.14±3.99
Mean cord width with standard deviation	1.54±0.36	1.68±0.38	1.42±0.27	1.43±0.31

TABLE 1 SHOWING MEAN CORD DIMENSION WITH STANDARD DEVIATION

CHART 1



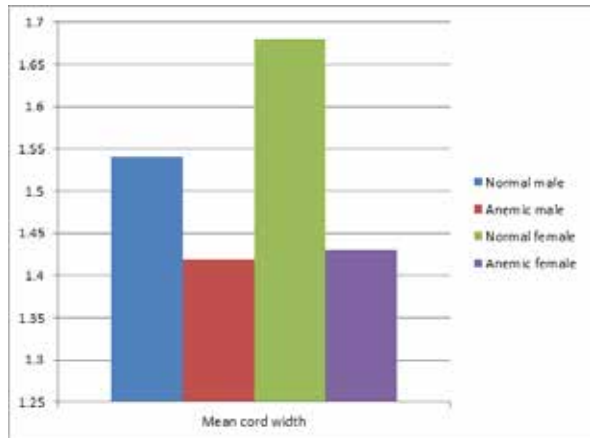


CHART 2

Sex of the baby		t	df	Sig. (2-tailed)
Male	Width of cord	1.1	56	0.276
	Length of cord	2.055	56	0.045
Female	Width of cord	2.108	40	0.041
	Length of cord	1.787	40	0.081

TABLE 2 SHOWING P. VALUES (SIG. (2-TAILED))

DISCUSSION

Movement of baby in the uterus creates tension on the cord & promotes growth of cord. Umbilical cord grows throughout the third trimester. Any Intrauterine constraint of its kind would reduce the tensile force resulting in the length of the umbilical cord being short (Lyndon et al., 1994) 6. Short umbilical cord is commonly associated with, pregnant for the first time, a female fetus, Preeclampsia, smoking and alcohol consumption 4.

The incidences of all types of cord complications increase as the cord length increases 7. Excessively short cords have been associated with a delay in second stage of labor, irregular fetal heart rate, birth asphyxia, placental abruption, inversion of uterus. Excessively long umbilical cords are associated with complications like cord prolapse, true knot entanglement around the fetus 8. Males have longer cord than females 9.

In this study the length and thickness of the cord in the anemic group is less than the normal pregnancy group. Small cord thickness is related with low birth weight and mechonium stain 6. The umbilical cord is larger in diameter in the fetuses of mothers with gestational diabetes than in the normal population due to the increase in its Wharton jelly content 3. The length and width of the cord in normal pregnancy female babies was found significantly higher than anemic group. The length and width of the cord in normal pregnancy male babies was found significantly higher than anemic group also. The mean fetal weight in normal pregnancy group was 2.62 kg and in the anemic group was 2.32 kg, which is less than the normal group. Single umbilical artery (SUA), the most common anatomical abnormality of the umbilical cord, is found in 0.2-1.1% of singleton pregnancies 8. In this study, only in three cases, two vessels were observed (0.03%). The mean length and diameters of the umbilical cords of male babies is larger than female babies in this study similar to the observation by (James L et al1983) 9.

CONCLUSION

The length and width of the cord in normal pregnancy male babies was found significantly higher than anemic group. The length of the cord in normal pregnancy male babies was found significantly higher than anemic group. The length of the cord in normal pregnancy fe-

male babies was found significantly higher than anemic group. The mean fetal weight in normal pregnancy group was 2.62 kg and in the anemic group was 2.32 kg less than the normal group due to the shorter length and diameter of the umbilical cords in anemic group.

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