



The relationship between the length of umbilical cord and neonatal outcomes

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DOI: 10.24896/jrmds.2017561

ABSTRACT

Maternal outcomes and prenatal outcomes depend on the mutual reactions between maternal and fetal and environmental factors. One of the influential cases in this field is the funis length. A descriptive analytic study was conducted on 300 pregnant women, who had been admitted in labor section. After placenta expulsion, the length of the funis, placental and birth weight were measured. Gestational age was determined according to maternal LMP and sonography of pregnancy. Meconial amniotic fluid was determined through labor examination in the amniotomy. The result revealed meaningful differences between neonatal height, placental and neonatal weight. No relationship was revealed between the length of funis and the sex of neonate, the situation of Amniotic fluid, and the first minute Apgar score. Considering the deficient that may be available in this study, it is recommended that a study be done in this fiend in other regions of the country and in other countries, in employed women, and in larger samples so that we can achieve comparative or new results in this regard.

Keywords: Umbilical Cord Length, Pregnancy, Neonatal Outcomes

HOW TO CITE THIS ARTICLE: Mohammad Reza Sharif, Kobra Shiasi, Gholamreza Soleimani, Seyed Mohammad-Bagher Akhavirad, Davood Kheirkhah, The relationship between the length of umbilical cord and neonatal outcomes, J Res Med Dent Sci, 2017, 5 (6): 1-5, DOI: 10.24896/jrmds.2017561

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Received: 15/07/2017

Accepted: 20/09/2017

or wrapped around the neck of the fetus arcs may be occur [1,4].

In Prolepses of the umbilical cord compression, fetal blood flow problems and

congestion caused by the duration and severity may bring up fetal hypoxia, brain damage and death [5]. Most babies with severe cord compression are stillbirths. Probably the intensity has a role in embryonic death. Rarely in pairs may have a very short cord detachment and inverted uterus is beneficial aspects [1].

Researchers found that human umbilical cord chronic compression of the oligohydramnios be affected or impaired function of decreased fetal movement can be reduced significantly [5- 10]. Research has linked the umbilical cord during pregnancy and the results have been different and sometimes contradictory results have been presented[11- 15].

INTRODUCTION

Prenatal outcome depends on the interaction between prenatal maternal factors, fetal and appropriating pregnancy outcome to an interaction is difficult [1]. One of the effective cases in this field is the length of the cord or Funis which is typically 30 to 100 cm and if its length is less than 30 cm, the short cord is called [1]. Short length of umbilical cord is a predisposing factor for breech presentation [1- 3]. Cord length varies markedly during the semester average is 55 to 60 cm [1, 2].

Generally, in cases where the umbilical cord injuries such as tall, abnormal vascular occlusion due to thrombosis, true knots, cord compression, umbilical cord prolapsed

Soernes and Bakke confirmed the breeches presentation versus cephalic and reported that the average length of the umbilical cord in breeches is about 5 cm shorter than the average length of the vertex position [6]. Scott believes the term length of cord in male infants in few more than female infants in vertex slightly over-weight breech fetus or placenta, and there is no correlation between the lengths of cord [4].

While Wu and colleagues in 1995, on 1087 women found relationship between the length of cord and placental weight and birth weight [3]. Stefos et al in their study found that mean cord length was significantly higher in women of parity ≥ 3 [7]. This study is going to investigate this matter.

MATERIALS AND METHODS

Present study was a descriptive study which in which 300 pregnant women referred to the Shahid Beheshti Hospital; random samples were selected by quota and studied. Sample demographics are shown in Table 1. Data collection tools included centimeter, scales and a questionnaire. The questionnaire was based on the research objectives through interviews, observations and measurements taken in the delivery room and operating room were recorded.

The first section contains 5 questions on demographic data (age, employment status, number of pregnancies, parity and number of living children) and the second part of the information was obtained through the measurement or observation in the delivery room. After existence of placenta, the umbilical cord length and baby height were measured using centimeters. Then, placental and babies weight were measured

using balance detailed. All information was recorded in the questionnaires that were prepared. Neonatal age at birth was determined based on LMP. Finally the Apgar score rating has been recorded.

In this research due to determining the scientific validity of the research instrument the content validity and test-retest reliability of the tool was used on 10 subjects. Using the Pearson correlation coefficient was calculated for each factor separately, none of the questions that this factor is less than 0.7 and not repeatable test results indicate the validity of the questionnaire.

In this survey, independent variables were pregnancy outcomes and the dependent variable was length of umbilical cord. Confounding variables were included; age, education level, employment status and number of children. The collected data were analyzed using SPSS software.

RESULTS

The results showed that 42.6 subjects had no history of previous pregnancies and a lower percentage had three or more pregnancies (9.1). 45.3 mothers had no history of previous delivery and the lowest percentage had delivered three or more (6.3). In this way, 92% had Childbirth through normal vaginal delivery. Also 36.6 subjects placental weight was below 500 grams and the lowest percentage (9.6) had a placental weight of 700 grams. The highest percentage (86.7) of mothers had clear amniotic fluid when delivery and the lowest percentage (1.0), amniotic fluid was blood-stained (placenta Abruptio), respectively. Table 1 shows some social-individual characteristics of pregnant women.

Table 1: Some social- individual characteristics of samples (n=300)

Variable	Number	Percentage
<u>Age (year)</u>		
Less than 18	3	1.0
18-23	108	36.2
24-29	105	35.2
30 or more	82	27.5
<u>Occupation</u>		
House wife	289	96.3
Employed	11	3.7
<u>Past pregnancy history</u>		
Hypertension	1	0.3
Diabetes	0	0.0
	10	3.3
	10	1.0
<u>Oligohydramnios Polyhydramnios</u>		
Oligohydramnios	3	95.3
No disease	286	

Table 2: Correlation between umbilical cord length and neonate sex (n=300)

Sex	Neonatal Mean	Standard deviation	Standard deviation
Boy	57.84	11.78	96.0
Girl	57.35	12.45	1.01
P Value	0.72		
T-Test	0.35		

The highest percent of long umbilical cord lengths (53.0) was between 63-48 cm and were not found any length of cord below 32 cm. The highest percentage (98) of presentations was cephalic presentation and the lowest percentage (0.7) was lateral presentation. In this study 50 percent of neonates were boy and 50 percent were girl (Table 2).

Highest percent (81.9) of neonates had 48-52 cm height and the lowest percent (3.3) had 53 cm and more height. The highest percentage (49.7) of neonates weighing were between 3500-3000 g and the lowest percent (4.0) were below 2500g. 2% of neonates had Apgar score of less than 8 minutes.

DISCUSSION

The results of this study showed no significant difference in the mean length of the cord and the baby's gender. In a study in Nigeria on 1000 pregnant women, no relationship found to parity, maternal age, or sex of baby [7]. However, the Wu et al in their study in Taiwan reached the results that cord length of male fetuses than female fetuses[3]. Scott also believes that in the long term umbilical cord of the newborn infant males slightly more than females [4].The reason for these phenomena may be low volume of sample in present research. According to ANOVA results of data analysis, there was a significant relationship between cord length and infant's height at birth. In this study, was observed statistic specific different between cord length with a height less than 48 cm high, 48 cm or more. Also that was meaningful statistical between 48-52 cm height and 53 cm or more and less than 48 cm. The results of ANOVA showed a significant association between cord length and weight at birth. So that there was a significant relationship between; the weight of less than 2500 g and 3000 g or more, the weight of 2500-3000 g and 3000 g or more, 3000-3500 g weight with Weighing under 2500 g, the weight of

3500 -4000 g with a weight below 2500 g, 4000 g weight or more and below 2500 g and 3000-2500 g. Wu and colleagues found similar results in their study in this regard and stated that the weight of the specific issues that are relationships cord[3].On the landscape of average length of cord, there are significant differences between weight under 500 gram with 500gr and higher than and between 500-600 gram with weight under 500 gram and weight 600-700 gram with weight under 500 gram and between 500 gram and higher with weight under 500gr.Unlike present study, Scott and colleagues argue that there is no correlation between the length of cord and placental weight [4].While Wu et al 1087 deliveries over the length of the cord between the placenta and birth weight were obtained [3]. In the present study, the length of the cord by the amniotic fluid and fetal Apgar score was not statistically significant. Miller and colleagues in their study considered umbilical cord length as a factor in the amniotic fluid amount. Wu and colleagues reached similar conclusions too [3]. Adinma found a correlation between umbilical length and placental weight [8]. Stefos et al showed that only birth weight could act as a covariate for the length differences between parity groups [7]. With usage of finding of this research, it can emphasis on the importance of Significant impact on the gestation duration on the social health and with attention to this note that in this duration have outcomes with depend on the interaction of maternal, fetal and maternal environmental familiarize themselves with the clinical significance. From this research results, it mention the relationship between fetal weight and placental findings as to the length of the cord. Since the length of the cord in infants weighing more and more on special occasions are such as diabetes, placental weight, it can decreases prolapsed side effects with timely action and lead to increase maternal and neonatal. This study, results the correlation between cords lengths during pregnancy with most of the mothers were housewives. Since in this

research, researcher has not reach significant relation between baby sex, meconial amnion fluid and first minute Apgar score. It proposed that in the same study in a larger number of samples may be taken to achieve new results.

Acknowledgments

The authors would like to appreciate the Clinical Research Center of Shahid Beheshti Hospital, Kashan University of Medical Sciences.

Funding source

None declared

Conflict of Interest

The authors have no conflict of interest to disclose.

Authors' Contribution

Mohammad Reza Sharif developed the study concept and design and the acquisition of data, interpretations of data, and drafting of the manuscript. Davood Kheirkhah, Gholamreza Soleimani, Seyed Mohammad-Bagher Akhvirad and Kobra Shiasi Arani developed the protocol, analysis of data and drafting of the manuscript.

REFERENCES

1. Carlo WA, Ambalavanan N. The umbilicus. In: kliegman RM, Stanton BF, St. Geme JW, Schor NF. Nelson textbook of pediatrics. 20th Edition, Philadelphia: Elsevier; 2016; p. 890-891.
2. Balkawade NU, Shinde MA. Study of length of umbilical cord and fetal outcome: a study of 1,000 deliveries. J Obstet Gynaecol India. 2012 Oct;62(5):520-5. doi: 10.1007/s13224-012-0194-0. PMID: 24082551
3. Wu JF, Chang SY, Hsu TY, Hsieh CH, Kung FT, Hwang FR, et al. Multivariate analyses of the relationship between umbilical cord length and obstetric outcome. Changgeng Yi Xue Za Zhi. 1996 Sep;19(3):247-52. PMID: 8921643
4. Scott, James R., et al. 2002. Diseases of Obstetrics and Gynecology Danfurs. Translated by Hamid Abtahi and others, Tehran, Nurdansh.
5. Adesina KT, Ogunlaja OO, Aboyeji AP, Olarinoye OA, Adeniran AS, Fawole AA, et al. UMBILICAL CORD PARAMETERS IN ILORIN: CORRELATES AND FOETAL OUTCOME. East Afr Med J. 2014 Aug;91(8):274-80. PMID: 26862652
6. Soernes T, Bakke T. The length of the human umbilical cord in vertex and breech presentations. Am J Obstet Gynecol. 1986 May;154(5):1086-7. PMID: 3706433
7. Stefos T, Sotiriadis A, Vasilios D, Tsirkas P, Korkontzelos I, Avgoustatos F, et al. Umbilical cord length and parity--the Greek experience. Eur J Obstet Gynecol Reprod Biol. 2003 Mar 26;107(1):41-4. PMID: 12593892
8. Adinma JI. The umbilical cord: a study of 1,000 consecutive deliveries. Int J Fertil Menopausal Stud. 1993.38(3):175-9.
9. Balkawade NU, Shinde MA. Study of length of umbilical cord and fetal outcome: a study of 1,000 deliveries. J Obstet Gynaecol India. 2012 Oct;62(5):520-5. doi: 10.1007/s13224-012-0194-0. PMID: 24082551
10. Georgiadis L, Keski-Nisula L, Harju M, Räsänen S, Georgiadis S, Hannila ML, Heinonen S. Umbilical cord length in singleton gestations: a Finnish population-based retrospective register study. Placenta. 2014 Apr;35(4):275-80. doi: 10.1016/j.placenta.2014.02.001. Epub 2014 Feb 11. PMID: 24560495
11. Ebbing C, Johnsen SL, Albrechtsen S, Sunde ID, Vekseth C, Rasmussen S. Velamentous or marginal cord insertion and the risk of spontaneous preterm birth, prelabor rupture of the membranes, and anomalous cord length, a population-based study. Acta Obstet Gynecol Scand. 2017 Jan;96(1):78-85. doi: 10.1111/aogs.13035. Epub 2016 Nov 9. PMID: 27696344
12. Ohno Y, Terauchi M, Tamakoshi K. Perinatal outcomes of abnormal umbilical coiling according to a modified umbilical coiling index. J Obstet Gynaecol Res. 2016 Nov;42(11):1457-1463. doi: 10.1111/jog.13092. Epub 2016 Aug 16. PMID: 27527823
13. Olaya-C M, Bernal JE. Clinical associations to abnormal umbilical cord length in Latin American newborns. J Neonatal Perinatal Med. 2015;8(3):251-6. doi: 10.3233/NPM-15915056. PMID: 26485559

14. Krueger MS, Eyal FG, Peevy KJ, Hamm CR, Whitehurst RM, Lewis DF. Delayed cord clamping with and without cord stripping: a prospective randomized trial of preterm neonates. *Am J Obstet Gynecol.* 2015 Mar;212(3):394.e1-5. doi: 10.1016/j.ajog.2014.12.017. PMID: 25526873
15. Krueger MS, Eyal FG, Peevy KJ, Hamm CR, Whitehurst RM, Lewis DF. Delayed cord clamping with and without cord stripping: a prospective randomized trial of preterm neonates. *Am J Obstet Gynecol.* 2015 Mar;212(3):394.e1-5. doi: 10.1016/j.ajog.2014.12.017. PMID: 25526873.