Second Trimester Umbilical Cord Coiling Index and Perinatal Outcomes

Yusuf Aytaç TOHMA[1], Mehmet Metin ALTAY[1], Derya TURGUT[1], Selcan COŞKUN[1], Eylem ÜNLÜBİLGİN[1], Sertaç ESİN[1], Orhan GELİŞEN[1], Okyar EROL[1]

Ankara, Turkey

OBJECTIVE: Umbilical cord usually seems simple functionally and structurally but it's the life link between fetus and mother that was critically important for growing fetus. The aim of this study is to evaluate the effect of early umbilical cord coiling index on perinatal outcomes.

STUDY DESIGN: 221 patients with singleton, alive pregnancies between 18-24 gestational weeks were included in our study and have been evaluated prospectively.

Patients' age, obstetric history, BMI before pregnancy, history of smoking was registered. Umbilical arter coiling index was also calculated. Perinatal problems such as preeclampsia, gestational diabetes mellitus (GDM), intrauterine growth restriction (IUGR), small for gestational age (SGA) and birth weight, gestational age at birth, and newborn intensive care unit need were recorded.

RESULTS: There was a negative correlation between antenatal umbilical cord coiling index (aUCI) and gestational age. The birth weights were lower in patients with hypocoiled umbilical cord structure. Preeclampsia was seen in 3.93% of patients with normal aUCI, 26.09 % in hypocoiling group, and 21.05 % in hypercoiling group. The percentage of patients with normal aUCI who had GDM is 2.18, 13.04% of patients with hypercoiling and 10.53% of patients with hypocoiling had GDM. The percentage of patients with normal aUCI who had IUGR is 3.49, 21.74% of patients with hypercoiling and 5.26% of patients with hypocoiling had IUGR. According to aUCI there was a statistical difference in GDM, preeclampsia and IUGR and different from the literature, in our study, we found a statistically significant difference in hypercoiled umbilical cords in terms of preeclampsia. Newborns with hypercoiling or hypocoiling were needed more neonatal intensive care unit.

CONCLUSIONS: There was measured correlation between umbilical cord diameter and aUCI between 18-24 weeks and perinatal outcome but new prospective studies about umbilical artery morphology and perinatal outcomes are also needed.

Keywords: Umbilical cord, Umbilical cord coiling index, Second trimester

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Introduction

Umbilical cord is the structure consisting of two arteries and one vein surrounded by Wharton jelly and ensuring the connection between fetus and placenta. Cord length may vary from 30 to120 cm.[1]. Its average length is considered as 54-66 cm. Measurements below 32 cm which forms 6% of all cases are considered as absolute shortness.[2] Umbilical cord with 1-2 cm of thickness has a helical structure consisting 10-11 coils ranging between fetal and insertion areas.[1] Pathologists had been examining morphologic and morphometric features of the umbilical cord and its relations with perinatal results for long years. The reason why antenatal evaluation was not made was the limitations of the equipment resolution used in obstetric ultrasonography.[3] Clinic experiments and experimental findings showed that umbilical cord's morphology and compounds affected birth type and result.[4,5,6]

Its coil shape is the unique feature of human umbilical cord. According to pathology and ultrasonography data, it is suggested that umbilical cord coil structure is developed as early as the 8th gestational week and that the spiral structure at the end of the first trimester resembles to that in the term. Factors that have influences over coiling number and direction of the arteries inside the umbilical cord are still much unknown. But it is known that fetal activity and several factors

[1] *Department of Gynecology Etlik Zübeyde Hanım Women's Health Teaching and Research Hospital, Ankara*

Address of Correspondence: *Yusuf Aytaç Tohma*
Etlik Zübeyde Hanım Women's Health Teaching and Research Hospital,
Etlik Ankara, Turkey
aytactohma@hotmail.com

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play roles.[1,7] As ultrasonography advances, interest for the coil structure of the umbilical cord revived. Recent findings showed that anomalies in the spiral structure were associated with the bad perinatal results.[8] Umbilical coiling index (UCI) used in determining umbilical coil structure is obtained by dividing total vascular coil number to the cord length. Hypercoiling (UCI>0,3 spiral/cm) and hypocoiling (UCI<0,1 spiral/cm) accompany increased fetal risk.[9]

Purpose of this study is to investigate whether umbilical coiling index can be used in predicting preeclampsia, GDM, IUGR, SGA, oligohydramnios, birth weight, birth type, development of fetal distress during birth, 5th minute Apgar score, neonatal intensive care requirement in pregnancy follow-up .

Design and Setting

300 women with single pregnancy who were in their 18-24th gestational weeks according to the last menstrual period date and who addressed to the T.C.S.B. Etlik Zübeyde Hanım Women's Health Teaching and Research Hospital Pregnancy Clinic between June 2009 and June 2010 for routine follow-up were included to the study and monitored prospectively. Detail information about the procedure of the study was given to the patients and their written consents were received. The original article has been approved by a suitably constituted Local Ethics Committee within which the work was undertaken and that it conforms to the provisions of the Declaration of Helsinki in 1995 (as revised in Edinburgh 2000).

Patient inclusion criteria were: singleton, alive pregnancies, between 18-24th gestational weeks according to LMP (confirmed by USG) with intact membrane.

Patient exclusion criteria were: patients with congenital chromosomal abnormality, pregnants with maternal systemic disease, amniotic fluid abnormalities (oligohydramnios, polyhydramnios), multiple pregnancies, and patients with single umbilical artery.

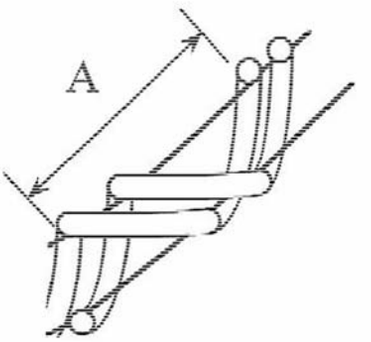
Material and Method

Patients were asked their age, gravida, parity, abortus and curettage, number of living children, patient's history, prepregnancy BMI, smoking status and obtained data were recorded. Rh-Rh discordance was not asked. Gestational weeks were determined according to the last menstrual period (LMP) and exact pregnancy week was confirmed with BPD measurement using LOGIQ P5 General Electric transabdominal 3,5-5,2 mHz convex probe at 5 mHz frequency.

BPD measurement was made on thalamus and cavum septum pellucidum level from tabula externa of the upper parietal bone to tabula interna of the lower parietal bone; and measurements were recorded.

A measurement was made for aUCI, for spiral length, on longitudinal layout all along ipsilateral cord side after one loop of umbilical artery from the outer side to the inner side of the same artery. Then aUCI was calculated as a reciprocal value of the distance between a pair of coils (antenatal umbilical cord coiling index =1/distance in cm) (Figure 1).

Figure.1. Umbilical coiling index calculation on longitudinal plane (aUCI: 1/A cm)



For each pregnant woman, one measurement was recorded. In order to prevent differences within and between observations, they were measured by the same investigator.

The study was completed with 271 patients because twenty-nine of the followed-up patients gave birth at different hospitals. UCI of the participants were examined by grouping by week. First group was 18-18$^{6/7}$ week and the others were 19-19$^{6/7}$ week (second group), 20-20$^{6/7}$ week (third group), 21-21$^{6/7}$ week (fourth group), 22-22$^{6/7}$ week (fifth group), 23-23$^{6/7}$ week (sixth group). According to the UCI, those who are less than 10 percentile were considered as hypocoil and those who are more than 90 percentile were considered as hypercoil.

Pregnant women were monitored during and after birth and it was recorded whether preeclampsia, GDM, oligohydramnios, IUGR, SGA were developed in those having the measurements of hypercoiling, normal and hypocoiling according to the UCI, birth type, fetus' birth weight, indications if C-section and 5th minute Apgar scores after birth and whether there were any need of intensive care for the neonate.

Statistical analysis

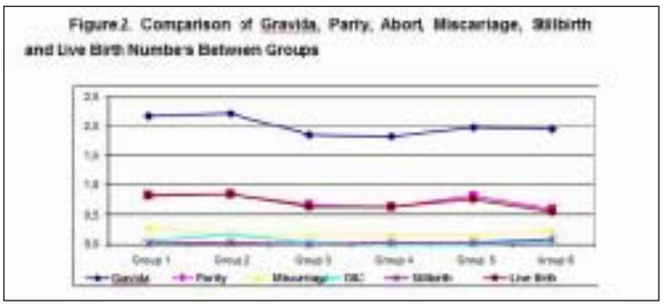
Data were analyzed by using SPSS 15.0 statistical pack program. In assessing the data frequency ranges, average, standard deviation was used. Categorical comparisons were realized by using Pearson Chi-Square and Fisher's exact tests. Conformity of the data to the normal range was checked by using Kolmogorov-Smirnov Z test. In this research, Independent Samples T test was used in order to compare whether there was any difference between groups. Mann-Whitney U test, One-Way ANOVA (Variance Analysis) and Kruskal Wallis test were also used. In multiple comparisons, in cases of difference between groups, Tukey HSD test was

applied to find out where is this difference. For the relationship between variables, Pearson Correlation test was used.

Results

Umbilical cord coiling index of 271 patients included to the study was measured; they were classified according to the week as: First group was 18-18$^{6/7}$ week and the others were 19-19$^{6/7}$ week (second group), 20-20$^{6/7}$ week (third group), 21-21$^{6/7}$ week (fourth group), 22-22$^{6/7}$ week (fifth group), 23-23$^{6/7}$ week (sixth group).

No significant difference was found between groups in terms of age (p=,391), gravida (p=,496), parity (p=,568), miscarriage (p=,789), stillbirth (p=,216) and live birth (p=,498) (Figure 2).

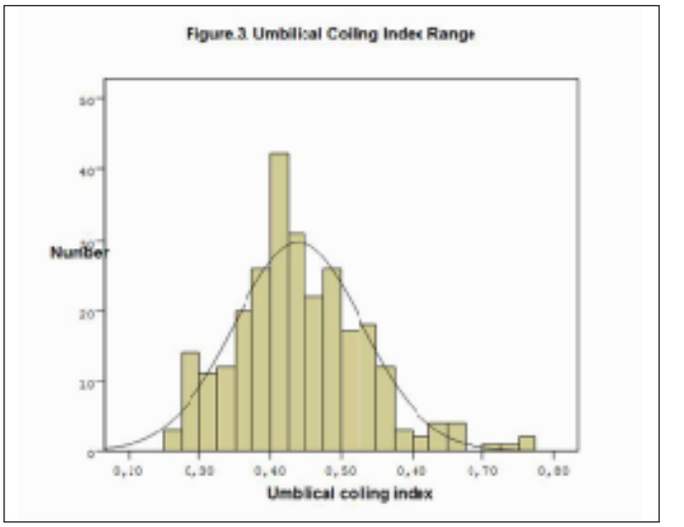


A statistically significant difference was found between groups in terms of UCI (p<,05). UCI was 0.47±0.09 in 18-18$^{6/7}$ week, then it decreased to 0,38±0,07 in 23-236/7 week. The highest UCI was found in 19-196/7 week (Figure 3).

UCI of 271 patients was calculated and the average UCI was found as 0.44. 90th percentile value of the UCI is 0.56 while 10th percentile value is 0.32. Those above 90th percentile were considered as hypercoiled umbilical cord while those below 10th percentile were considered as hypocoiled umbilical cord (Figure 3).

According to the Umbilical Coiling Index, there was a statistically significant difference in terms of pregnancy week (P<,0001). 78.26% of hypocoiled umbilical cords were between 21st week and 24th week. 89.48% of hypercoiled umbilical cords were between 18th week and 21st week (Table 1).

According to UCI, no statistically significant difference



was found in terms of age (p= ,090), gravida (p=,511), parity (p=,688) and birth week (p= ,057) (Table 1).

According to UCI, a statistically significant difference was found in terms of birth weight (p=.002). Normal birth weight was observed in those with hypocoiled structure in umbilical cord while lower birth weight was observed in those with hypocoiled structure (Table 1).

A negative directional significant relationship between Umbilical Coiling Index and BPD values on r=-0.366 level was found and this relationship was considered as statistically significant (p<,0001) (Figure 4).

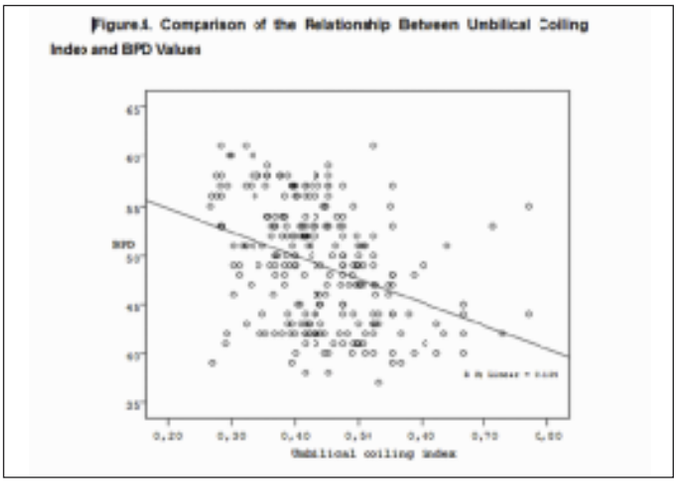


Table 1: Comparison of age, gravida, parity, birth week and birth weight by umbilical coiling index

	Hypo (n=23)	Normal (n=229)	Hyper (n=19)	P
Age	28.30±5.49	25.73±5.54	26.68±5.20	.090
Gravida	2.26±1.39	1.98±1.17	1.89±0.99	.511
Parity	0.87±0.87	0.71±0.86	0.68±0.82	.688
Birth Week	38.73±2.15	39.53±1.75	38.79±2.64	.057
Birth Weight	2899.57 ± 583.63	3247.34±467.00	3058.95±574.07	.002

According to the Umbilical Coiling Index, a statistically significant difference was found in terms of birth type (P<,0001). Those who had hypocoiled structure in umbilical cord had 52.17% C/S rate while this ratio was 31.58% with hypercoiled structure. The percentage of the C-section patients due to recurrent C/S who had hypocoiled structure is13.04 while 4.80% of them had normal coil structure. The percentage of the newborns that were born with C/S due to fetal distress who had hypocoiled structure is 30.43; 15.79% of them had hypercoiled structure and 2.62% of them had normal coiled structure. One patient who had C/S due to abruptio placenta had normal umbilical coiled structure. One patient who had C/S due to cord presentation had hypercoiled umbilical cord structure (Table 2).

Table 2: Comparison of the mode of delivery and umbilical coiling index

Mode of Delivery	Hypo (n=23)		Normal (n=229)		Hyper (n=19)		P
	n	%	n	%	n	%	
C/S	12	52.17	37	16.16	6	31.58	< .0001
Normal Vaginal Delivery (NVD)	11	47.83	192	83.84	13	68.42	

According to UCI, a statistically significant difference was found in terms of neonatal intensive care need (P<,0001). Fetuses with hypercoiled or hypocoiled structure, more intensive care unit requirement was observed. In a newborn having need of intensive care due to diaphragm hernia, hypercoiled umbilical cord structure was observed. The percentage of the newborns needed intensive care due to meconium aspiration that were observed to had hypocoiled was 8.70, 10.53 percent of them to had hypercoiled umbilical cord structure while 1.75% of them were observed with a normal umbilical cord structure. (Table 3)

Table 3: Comparison of neonatal intensive care unit requirement and umbilical coiling index

Mode of Deliveryl ntensiv e care	Hypo (n=23)		Normal (n=229)		Hyper (n=19)		P
	n	%	n	%	n	%	
Yes	7	30.43	12	5.24	6	31.58	< .0001
No	16	69.57	217	94.76	13	68.42	

According to the 5th minute Apgar score, no statistically significant difference was found in terms of Umbilical coiling index (p=.335). Patients with 5th minute Apgar score less than 7, UCI was calculated as 0.47; while patients with 5th minute Apgar score more than 7, UCI was calculated as 0.44.

According to Umbilical coiling index, no statistically significant difference was found in terms of smoking condition (P=,285). The percentange of smokers who had hypocoiled structure was 13.04 and 11.35% of them had normal structure. It was observed that none of the patients with hypercoiled structure smoked.

According to the UCI, a statistically significant difference in terms of preeclampsia was found (P<,0001). Patients with normal UCI had 3.93% preeclampsia rate while patients with hypocoiled structure this ratio was 26.09% and patients with hypercoiled structure, it was 21.05%. There was a statistically significant difference in terms of GDM (P: ,008). GDM ratio of patients with normal UCI was 2.18% while patients with hypocoiled structure, this ratio was 13.04% and patients with hypercoiled structure, GDM ratio was 10.53% (Table 4). A statistically significant difference in terms of IUGR was found (P:.001). IUGR ratio of those with normal UCI was 3.49% while patients with hypocoiled structure, this ratio was 21.74% and patients with hypercoiled structure, IUGR ratio was 5.26% (Table 4).

Table 4: Preterm Labor, Oligohydroamnios, preeclampsia and umbilical coiling index

	Hypo (n=23)		Normal (n=229)		Hyper (n=19)		
Preeclampsia (+)	n	%	n	%	n	%	
	6	26.09	9	3.93	4	21.05	<.0001
Preeclampsia (-)	17	73.91	220	96.07	15	78.95	
GDM (+)	3	13.04	5	2.18	2	10.53	.008
GDM (-)	20	86.96	224	97.82	17	89.47	
IUGR (+)	5	21.74	8	3.49	1	5.26	.001
IUGR (-)	18	78.26	221	96.51	18	94.74	
SGA (+)	2	8.70	6	2.62	1	5.26	.267
SGA (-)	21	91.30	223	97.38	18	94.74	
Preterm Labor (+)	1	4.35	6	2.62	--	--	.674
Preterm Labor (-)	22	95.65	223	97.38	19	100.00	
Oligo (+)	2	8.70	7	3.06	1	5.26	.366
Oligo (-)	21	91.30	222	96.94	18	94.74	

Discussion

Origine and importance of the umbilical cords cold structure Is the subject of many studies. Various hypotheses were suggested to explain the umbilical cords coil structure. These are fetal movement, umbilical vascular growth rate, fetal hemodynamic force and genetic factors.[10,11] In the studies, a correlation was found between shortage or absence of umbilical coiling index and aneuploidy.[7,9] In conclusion, cord structure

is under genetics control, and underlying mechanism in possible defects are primary defect during embryogenesis. UCI shortage or absence is more often observed in single umbilical artery rather than normal umbilical cord and it is believed that the atypical cold structure is caused by early embryological defects.[8]

Measurement of umbilical cords structure was first described by Edmond in 1954. Umbilical coiling index (UCI) is obtained by dividing the total vascular coil number by the cord's length and takes negative - positive values by turning the coil right or left.[12] Strong et al suggested the UCI as an independent standard method from the turning direction of the coil1[3] It was found that hypercoiling (UCI>0.3 spiral/cm) and hypocoiling (UCI<0.1 spiral/cm) accompany increased fetal risk.[9]

Studies show that there is a correlation between antenatal umbilical coiling index (aUCI) during the third trimester or just before the birth and umbilical coiling index (UCI) calculated after the birth.[14,15,17] In some studies, aUCI was calculated for the second trimester and a correlation with the real UCI after the birth. UCI can be easily and accurately specified in the second trimester becuase the amniotic liquid is relatively more.[16,17,18] In our study, since we aim to determine whether aUCI measurement can be used for determination of pregnancy results in routine examination program, we only performed aUCI measurement and we didn't compare it with the actual UCI after birth.

Laat et al performed aUCI measurement in 117 pregnant women in their 28th week and UCI measurement after birth and they found ne correlation between them. They determined increased risk of surgical birth at patients with hypercoiled structure because of the corruption in SGA, fetal heart rate.[19]

Qin et al. performed UCI measurement in 374 patients in the second trimester and after birth and they investigated the correlation between these two. Antenatal measurement was perfomed in 3 different parts of the umbilical cord (fetal zone, free middle zone, placenta zone) and it was determined that coil amount close to fetal abdomen was more than the placenta zone. They reported that umbilical cord coil amount in the second trimester was considered sufficient and reliable but this measurement didn't accurately reflect the coil number in the term. In addition, they stated that coil amount was decreasing from fetal zone to placenta zone.[9] In his study, Edmond indicated that there were more coils in fetal zone.[20] In the study realized by Kurita et al, UCI measurement was performed in 3 different parts of the umbilical cord (fetal zone, free middle zone, placenta zone) and no difference was found.[21] In this study, we performed the measurement for aUCI calculation from the free middle zone.

Ezimokhai et al found that in pregnant women with GDM, perinatal mortality was increased than the women with hypocoiled sturucture. These findings are similar in non-diabetic pregnant women.[22,23,24] Another finding shows that those who have GDM and hypercoiled structure also have bad perinatal results (low birth weight, IUGR, fetal distress). In non-diabetic pregnant women, Strong and Rana obtained the same conclusion.[7] while Ercal and Attala obtained different ones. [25,26] A study indicates that the reason of increase in umbilical cord coil amount is that umbilical vein is pressured and the blood flow between fetus and placenta is depressed. It seems that cords with more coil amount are less flexible or more inclined to be bent, to torsion which leads to fetal hypoxia.[14] In pregnant women with gestational diabetes, this effect is more often observed because wharton's jelly's content change and decrease as mucopolysaccharide and collagen making is reduced.[27] A study shows that non-coil cords are more sentisive to external effects and that it leads to the depression of umbilical vascular blood flow.[11] In a study regarding searching in vitro perfusion of umbilical vessels, no difference is found in sensibility of cords with and without spiral sturucture to external effects.[15] This observation supports the idea that the correlation between not having a umbilical cord coiled structure and bad perinatal consequences doesn't originate from a simple difference such as cord's external appearance. Studies prove that gestational diabetes have bad microscopic, ultrastructural and immunohistochemical effects on umbilical veins and connective tissue components of the wharton' jelly. [26,27,28] These effects include erosion, rupture on both vasculer wall and connective tissue, undesired dilatation on vessels, degeneration and disruption in muscle layer, restructure resulting in disruption in wharton's jelly's tendons.[27,28] But a recent study shows that the coil structure may prevent fetal hypoxia in fetuses by preventing vascular compression during birth.[14] In conclusion, both having and not having a coil structure are important for fetus and increase perinatal mortality.

Predanic et al calculated umbilical cord's coil amount in 294 patients between 18-23rd weeks and compared pregnancy results. Abnormal coil amount (hypercoiling - hypocoiling) SGA, oligohydramnios and increased fetal mortality risk during birth were found associated. In this study, there was no significant difference between abnormal coil amount and SGA development and oligohydramnios[15]

Strong et al indicated that there was a statistically significant difference in terms of IUGR development at patients with hypocoiling by UCI.[7] Eizomakhai et al found a statistical correlation between hypercoiling structure and IUGR.[15] In our study, IUGR ratio of those with normal UCI was 3.49% while patients with hypocoiled structure, this ratio was 21.74% and patients with hypercoiled structure, IUGR ratio was 5.26%. A statistically significant difference in terms of IUGR development at patients with hypocoiling by UCI.

Laat et al calculated post-delivery umbilical coiling index in 565 pregnant women and examined the relationship with pregnancy results. Hypercoiled structure was found associated with fetal death, iatrogenic preterm delivery, chromosome anomalies, low birth weight by gestational age, trombosis on placenta walls. In addition less coil structure was associated with low apgar score, chorioamnionitis, fetal death, chromosomal abnormality. No relationship between meconium-stained amniotic fluid and abnormal coil amount was found. Compared to other studies, in this study preterm delivery was sectioned as spontaneous and iatrogenic and no relationship was found between spontaneous preterm delivery and having more coil structure.[29] This distinction was not made in the study of Rana et al.[15] In our study, we only included spontaneous preterm deliveries and we could find no significant difference between preterm delivery and antenatal UCI.

Raio et al evaluated umbilical cord morphology and morphometry in 112 pregnant women between 10-15th weeks and determined a negative correlation between UCI and gestational age. They indicated that the reason of this findigs ; the umbilical cord grew longer as pregnancy age advances but the total coil amount stayed the same after the second trimester.[30] In this study, we determined a decrease in aUCI measurement as pregnancy age increased which was consistent with the literature. A statistically significant difference in terms of UCI was found between groups (P<.05).

Predanic and Perni evaluated the relationship between the second trimester umbilical cord thickness and umbilical cord coiling index and found no correlation. A correlation was found between antenatal cord thickness and estimated birth weight, and there is no correlation with UCI.[31] In this study, a statistically significant difference in terms of birth weight by UCI was determined (P=.002). Patients with hypocoiled structure in umbilical cord had normal birth weight while patients with hypercoiled structure had lower birth weight.

Strong et al first compared pregnancy results of the groups having and not having umbilical cord coiling. In the group without coiling, there was a great increase in intrauterine death, intrapartum fetal heart rate decelaration, preterm delivery, operative delivery because of fetal distress, meconium-stained amniotic fluid, karyotype abnormalities.[7] In their following studies, they made a grouping by using umbilical coiling index and found bad perinatal consequences in those having below 10th percentile - above 90th percentile.[13] Ezimokhai et al found a relationship between cords having and not having hypercoiled structure and bad perinatal consequences, urgent C-section delivery, meconium-stained amniotic fluid. No relationship was determined at patients with hypocoiled structure.[15] Machin et al obtained similar results.[32] Rana et al found no relationship between abnormal UCI and aneuploid, fetal anomaly, low apgar score, meconium-stained amniotic fluid.[14] In our study, 7 out of 23 patients (30.43%) with hypocoiled structure had C-section because of fetal distress; this ratio was 15.79% in hypercoiling group. In addition, intensive care unit requirement by UCI was found higher in hypocoiling group than hypercoiling group.

Ezimokhai et al suggested a relationship between patients with noncoiling as UCI (extreme example of hypocoil) and preeclampsia (15) Gupta et al also obtained similar results. In this study, patients with normal UCI had 3.93% preeclampsia rate while patients with hypocoiled structure this ratio was 26.09% and those with hypercoiled structure, it was 21.05%.

Ezimokhai et al determined a relationship between patients with hypercoiling and hypocoiling UCI and GDM.[15.18] In our study, GDM ratio of patient with normal UCI was 2.18% while patients with hypocoiled structure, this ratio was 13.04% and patients with hypercoiled structure, GDM ratio was 10.53%. According to the UCI, there was a statistically significant difference in terms of GDM which is consistent with the study of Ezimokhai et al.

Ezimokhai et al calculated after-delivery UCI in 657 patients; maternal age of patients with more coils were determined as above 35 or below 18 and obesity was determined in patients with less coills. In our study, there was no difference in terms of maternal age and BMI.15 M. Kashanian et al calculated UCI in 699 patients after the delivery and did not determine any relationship between maternal age and partiy.32 In other studies, no association between UCI and maternal age, gravida, parity, birth weight, oligohydramnios.33

In a study conducted by Van Diik et al, no significant relationship between UCI in terms of maternal age, parity, gestational age in delivery, birth weight and gender.[34] Our study obtained similar results. Birth weight with hypocoiling was 2899.57±583.63 gr; with normal UCI it was 3247.34±467.00 gr and with hypercoiling it was 3058.95±574.07 gr. Hypocoiled ones were determined having lower weight. There was a statistically significant difference between hypocoiled and normal ones by birth weight.

Conclusion

Umbilical cord is the life connection that ensures the relationship between fetus and placenta, is seen structurally and functionally simple but has a critical role in the growing fetus. Umbilical cord is the most important component of the feto-placental unit and has a distinctive role at the beginning of extauterine life. In the second and third trimesters, it is known that changed umbilical cord morphology is associated with bad perinatal consequences. This study examined whether umbilical coil index can be used in predicting pre-eclampsia,

GDM, IUGR, SGA, oligohydramnios , birth weight birth type, development of fetal distress during birth, 5th minute apgar score, neonatal intensive care requirement in pregnancy follow-up.

Consistent with the literature, our study could find no correlation between umbilical coiling antenatal index and maternal age, gravida, pre-pregnancy BMI, smoking history.

As pregnancy age increases, it was determined that aUCI measurement was decreased. Patients with abnormal coiled structure (hypercoiling and hypocoiling), especially at patients with hypocoiling, it was found that IUGR was more developed. Consistent with the literature, GDM was found more developed in patients with abnormal coiled structure. No correlation between abnormal coiled structure and SGA, oligohydramnios, preterm delivery. In addition, umbilical cords having abnormal coiled structure were not found more in need of C-section and neonatal intensive care becuase of fetal distress.

Different from the literature, our study found a statistically significant difference in hypercoiled umbilical cords in terms of preeclampsia. Our finding must be supported mostly by prospective study and the mechanism of relationship between hypercoiled umbilical cord and preeclampsia must be revealed.

As a result, a relationship was found between antenatal UCI performed in 18-24th weeks and perinatal results. But more extensive results are needed in determining the perinatal consequences of umbilical cord morphology monitored in earlier periods.

İkinci Trimester Umblikal Kord Sarmal Indeksi ve Perinatal Sonuçları

AMAÇ: Umblikal kord, fetüs ile plasenta arasındaki ilişkiyi sağlayan, hem yapısal hem de fonksiyonel olarak basit görülen, ancak gelişmekte olan fetüsün yaşamında kritik bir rol üstlenen yaşam bağıdır. Çalışmamızın amacı perinatal sonuçları öngörmede erken dönemde bakılan umblikal kord sarmal sayı indeksinin önemini araştırmaktır.

GEREÇ VE YÖNTEM: Çalışmaya gebe polikliniğine başvuran 18-24. gestasyonel haftalarda tek, canlı gebeliği olan 271 gebe dahil edildi ve prospektif olarak izlendi.

Hastaların yaş, obstetrik hikayesi, bu gebeliğinde sigara kullanıp kullanmadığı ve gebelik öncesi beden kitle indeksi (BKI) değerleri kaydedildi. Antenatal umblikal sarmal sayı indeksi (aUCI) hesaplaması yapıldı. Bu gebeler izlenerek preeklampsi, GDM, intrauterin gelişme kısıtlılığı (IUGR), gestasyonel yaşa göre küçük fetus (SGA) gelişip gelişmediği ayrıca doğum kilosu, doğum şekli, doğum yaptığı hafta, yenidoğan yoğun bakım ihtiyacı olup olmadığı, 5. dakika apgar skoru kaydedildi.

BULGULAR: Antenatal kordon sarma endeksi (aUCİ) ve gebelik yaşı arasında negatif korelasyon. Hiposarmal umblikal kordon yapısı olan hastalarda doğum kilosu anlamlı olarak daha azdı. Sarmal sayı indeksi normal olanların preeklampsi oranı %3,93 iken, hiposarmal olanlarda %26,09, hipersarmal olanlarda %21,05 olduğu bulundu. Sarmal sayı indeksi normal olanların GDM oranı %2,18 iken, hiposarmal olanlarda %13,04, hipersarmal olanlarda %10,53 olduğu bulundu. Sarmal sayı indeksi normal olanların IUGR oranı %3,49 iken, hiposarmal olanlarda %21.74, hipersarmal olanlarda %5,26 olduğu bulunmuştur. Sarmal sayı indeksine göre; GDM, preeklampsi ve IUGR yönünden istatistiksel olarak anlamlı bir fark olduğu bulundu (p<0,05). Yenidoğan yoğun bakım ihtiyacı açısında sarmal sayı indeksi yönünden yapılan karşılaştırmada hiposarmal olanlarla, hipersarmal olanlarda yoğun bakım ihtiyacı fazla bulundu.

SONUÇ: Sonuçta bizim bulgularımız 18-24 hafta arası umblikal kord kalınlığı, sarmal sayı indeksinin ölçülmesinin perinatal sonuçları öngörmede önemli olabileceğini düşündürmektedir. Ancak bunun önemini belirlemek için daha geniş kapsamlı çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Umblikal kord, Sarmal sayı indeksi, İkinci trimester

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