Obstetrics; *Maternal-Fetal Medicine and Perinatology*

Risk Factors and Outcomes of Umbilical Cord Prolapse: Evaluation of 94 Cases

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ABSTRACT

OBJECTIVE: The aim of this study was to evaluate the risk factors and outcomes of umbilical cord prolapse.

STUDY DESIGN: In this descriptive retrospective study, 94 cases of umbilical cord prolapse between January 2013 and December 2014 in our department were analyzed.

RESULTS: 45166 births occurred in our hospital during the study period, and the prevalence of umbilical cord prolapse was 2.08 (n=94) per 1000 live births, and the perinatal mortality rate was 1.1%. In all pregnant women, the delivery had been performed by emergent caesarean section. The average age, gravida, parity and gestational week of pregnant women were 29.11±6.17, 3.69±2.48, 2.69±2.48 and 37.61±3.17, respectively. Singleton pregnancies were 95.7% (n=90) of all pregnancies and twin pregnancies were 4.3% (n=4). Presentation of the cases were vertex, breech or transverse at 75.5% (n=71), 16% (n=15) and 8.5% (n=8) of all cases respectively. Polyhydramnios complicated 13.8% (n=13) of all cases and average birth weight was 3138.62±759.89 grams. 16% (n=15) of the cases had a birthweight lesser than 2500 gr. 1st and 5th minute APGAR scores were 6.89±2.05 and 8.69±1.39, respectively. The time period between the diagnosis and delivery was demonstrated as 8.24±1.22 minutes.

CONCLUSION: Breech presentation, polyhydramnios, multiple pregnancies and low birth weight are risk factors for umbilical cord prolapse. Shortening the time interval between diagnosis and delivery significantly reduces perinatal mortality. It can be provided at clinics that presenting the appropriate infrastructures for rapid intervention.

Keywords: Emergency caesarean section, Perinatal mortality, Umbilical cord prolapse

Introduction

Umbilical cord prolapse is one of the rare obstetrics emergency and has been defined as the descent of the umbilical cord through the cervix (1-2). The prevalence has been shown to be between 1.4 and 6.2 per 1000 pregnancies in the literature (3-

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5). If rapid diagnosis is not possible, perinatal mortality varies between 3.5 and 19% (6). Two types of umbilical cord prolapse have been defined: overt and occult. In the overt type, the cord is between the vulvas or in the vagina. In the occult type, the cord is caudal to the presented part and can be detected only upon cervix during digital examination. Several risk factors (such as multiparity, prematurity, breech presentation, multiple pregnancies, polyhydramnios, artificial rupture of membranes, low birth weight, etc.) are associated with umbilical cord prolapse (3). However, it is difficult to predict pregnancies that may get complicated by umbilical cord prolapse (7). Both rapid diagnosis and the emergent delivery are crucial for the reduction of perinatal mortality and morbidity (8-9).

In this study, we aimed to evaluate the risk factors and outcomes of umbilical cord prolapse.

Material and Method

This descriptive retrospective study was approved by the local ethics committee (02.02.2018-18). In this study, 94 cases those were subjected to umbilical cord prolapse between January 2013 and December 2014 in the Health Sciences University Diyarbakir Gazi Yasargil Training and Research Hospital have been analyzed. Information about pregnancies

with umbilical cord prolapse was obtained by reviewing the hospital medical records. In compliance with ethical standards, anonymous data were generated for statistical analysis.

The ages and parities of the patients, gestational weeks, presentation of the fetuses, whether the pregnancy is a singleton or twin pregnancy, the time period between diagnosis and delivery, type of delivery, birth weight and 1st and 5th minute APGAR scores have been recorded for the pregnant women and the obtained data were compared with the literature. The exclusion criteria were the pregnancies with umbilical cord prolapse and without any fetal cardiac activity those were determined in the obstetric ultrasound.

Statistical analysis

IBM SPSS Statistics 22 (IBM SPSS, Chicago) software has been used for the statistical analyses. Descriptive statistical methods (average, standard deviation, frequency) was used for the analysis of the data.

Results

During the study period, the total number of births was 45166, and the prevalence of umbilical cord prolapse was 2.08 per 1000 births. Perinatal mortality rate was 1.1% (n=1). In all cases, the delivery route was emergency caesarean section.

Distribution of obstetric and neonatal outcomes and characteristics of pregnant women that are complicated with umbilical cord prolapse are presented in table 1. The average age of the patients was 29.11±6.17 years. The average gravidity, parity, gestational week at birth were found to be 3.69±2.48 (median 3), 2.69±2.48 (median 2) and 37.61±3.17, respectively. The time period between diagnosis and delivery was 8.24±1.22 minutes. 1st and 5th minute APGAR scores were 6.89±2.05 and 8.69±1.39, respectively. Average birth weight was 3138.62±759.89 grams. 95.7% (n=90) of all cases were singleton pregnancies while 4.3% (n=4) were twin pregnancies. Presentation of the cases was vertex, breech or transverse at 75.5% (n=71), 16% (n=15) and 8.5% (n=8) of the cases, re-

Table 1: *Distribution of obstetric and neonatal outcomes and characteristics of pregnant women that are complicated with umbilical cord prolapse*

	Umbilical cord prolapse n=94
Age (y), ave.±SD, (min-max)	29.11±6.17 (16-43)
Gravida, ave.±SD, (min-max)	3.69±2.48 (1-12)
Parity, ave±SD, (min-max)	2.69±2.48 (0-11)
Gestational week, ave±SD, (min-max)	37.61±3.17 (27-41)
Time between diagnosis and delivery (minute), ave.±SD, (min-max)	8.24±1.22 (6-13)
1st minute Apgar score, ave±SD, (min-max)	6.89±2.05 (1-10)
5th minute Apgar score, ave.±SD, (min-max)	8.69±1.39 (4-10)
Birth weight (gr), ave.±SD, (min-max)	3138.62±759.89 (720-4500)
Pregnancy, n (%)	
-singleton	90 (95.7%)
-twin	4 (4.3%)
Fetal Presentation, n (%)	
-vertex	71 (75.5%)
- breech	15 (16.0%)
- transverse	8 (8.5%)
Type of delivery, n (%)	
- caesarean	94 (100%)
Gestational week, n (%)	
-<37 weeks	22 (23.4%)
-≥37 weeks	72 (76.6%)
Birth weight, n (%)	
-<2500 gr	15 (16%)
-≥2500 gr	79 (84%)
Amniotic fluid, n (%)	
- Normal	81 (86.2%)
- Polyhydramnios	13 (13.8%)

Ave: Average, Min: Minimum, Max: Maximum, Gr: Gram, Y: Year

spectively. During the diagnosis, the gestational week was lower than 37 weeks in 23.4% (n=22), and the remaining 76.6% (n=72) was over 37 weeks. For 16% of the cases (n=15) the birth weight was under 2500 grams, and the remaining 84% (n=79) was over 2500 grams. For 86.2% (n=81) of the pregnant women, the amniotic fluid was normal, however, the remaining 13.8% (n=13) was found to be complicated with polyhydramnios.

Discussion

Despite the fact that umbilical cord prolapse is a rare obstetrics emergency and risk factors are well known, it is difficult to predict it. It was reported that sudden, severe and prolonged decelerations after normal fetal heartbeats can be the first sign of umbilical cord prolapse (10).

Gungorduk et al. had determined the prevalence as 0.95 per 1000 deliveries, and it was reported 1.4 in the study by Khan et al., Faiz et al. had reported mildly elevated rates as 1.99 than previous studies (11,12,13). The rate obtained from our study was 2.08 and it was similar to literature, but higher than the results of the studies mentioned above (11-13).

When considering the existing risk factors in our study, the rate of breech presentation, polyhydramnios, multiple pregnancies and low birth weight was 16%, 13.8%, 4.3% and 16 % respectively and these results were similar to the other studies (11,14-16).

The perinatal mortality rates vary between 3.5 and 19 % in literature (4). The most important factor for perinatal mortality was determined as the time period between diagnosis and delivery. In our study, the perinatal mortality rate was 1.1 % and the average time period between diagnosis and delivery was 8.24 minutes. In our study, the perinatal mortality rate is lower than those mentioned in the literature and the time elapsed between diagnosis and delivery is quite short. This shorter time period is related to our delivery room facilities such as continuous fetal monitoring for all of the pregnant patients, and presence of 7/24 working active surgery and anesthesia team in the delivery room. Esinler et al. had obtained 8.3±3.1 minutes' time interval between diagnosis and delivery with the same delivery room facilities and it was similar to our results (14).

Small number of cases, retrospective design of the study and lack of a control group may be considered as limitations of our study.

In conclusion, umbilical cord prolapse is a rare obstetrics emergency. Breech presentation, polyhydramnios, multiple pregnancies and low birth weights are the risk factors for umbilical cord prolapse. Shortening the time interval between diagnosis and delivery significantly reduces perinatal mortality. It can be provided at clinics that presenting the appropriate infrastructures for rapid intervention.

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