Araştırma Makalesi / Research Article

Evaluation of the Babies of Mothers With Placental Implantation Defects: Single center results

Plasental Implantasyon Defektli Annelerin Bebeklerinin **Değerlendirilmesi**: Tek Merkez **Sonuçları**

Adnan BARUTÇU [1], Ferda ÖZLÜ [2], Ayşe HİTAY İNAN [3], Selim BÜYÜKKURT [4], Hacer YAPICIOĞLU YILDIZDAŞ [2], Mehmet SATAR [2]

[1]Halfeti State Hospital Department of Pediatrics, Şanlıurfa, Turkey
[2]Çukurova University Medical Faculty Department of Neonatology, Adana, Turkey
[3]Çukurova University Medical Faculty Department of Pediatrics, Adana, Turkey
[4]Çukurova University Medical Faculty Department of Obstetric and Gynecology, Adana, Turkey

Abstract

Background: Placental implantation defects are the most important causes of antepartum vaginal bleeding. In addition, the incidence of perinatal complications is also increased mainly due to preterm birth and small-forgestational-age fetuses. The other complications in neonates are intrauterine asphyxia, infections, respiratory distress. The aim of this study is to determine its association with adverse maternal and neonatal outcomes.
Materials and Methods: Babies of the mothers with placental implantation defects followed in Neonatal Intensive Care Unit (NICU) in 2014-2015 were retrospectively sectional screened and involved in the study. Fetal loses, stillbirth fetuses, and live births were recorded. Neonatal evaluation included Apgar scores, birth weight, resuscitation in delivery room, respiratory distress, surfactant application, ventilator support, early and late onset neonatal sepsis, feeding tolerance, major anomalies and mortalities of the babies hospitalized in Neonatal Intensive Care Unit were investigated from hospital records.
Results: There were 116 premature infants (90,62%) hospitalized in NICU and 9 infants (7,03%) had surfactant therapy for severe respiratory distress syndrome (RDS). Also, there were 68 infants hospitalized for respiratory distress due to pneumonia, transient tachypnea of neonate or RDS had ventilator support. NICU hospitalization incidence is higher in neonates of mothers with placental implantation defects.
Conclusion: As well as antenatal careful follow up of mothers, it is also important that these pregnants give births in centers with third level neonatal intensive care units.

Keywords: Placental implantation anomaly, Newborn, Small for gestational age, Respiratory distress syndrome

Öz.

Amaç: Plasental implantasyon defektleri, antepartum vajinal kanamanın en önemli nedenleridir. Ek olarak, perinatal komplikasyonların insidansı da, özellikle preterm ve gebelik yaşına göre küçük doğan bebeklere bağlı olarak artmaktadır. Yenidoğanlarda diğer komplikasyonlar intrauterin asfiksi, enfeksiyonlar ve solunum sıkıntısıdır. Bu çalışmanın amacı, bu durumların anne ve yenidoğanda getirdiği sonuçlarla olan ilişkilerini belirlemektir
Materyal ve Metod: Yenidoğan yoğun bakım ünitesinde 2014-2015 yıllarında plasental implantasyon bozukluğu olan annelerin bebekleri geriye dönük olarak tarandı ve çalışmaya alındı. Fetal kayıplar, ölü doğumlar ve canlı doğumlar kaydedildi. Yenidoğan değerlendirmesi; yoğun bakım ünitesine yatırılan bebeklerin Apgar skorları, doğum ağırlığı, doğum odasında resusitasyon, solunum sıkıntısı, sürfaktan uygulaması, ventilatör desteği, erken ve geç başlangıçlı yenidoğan sepsisi, beslenme toleransı, major anomalileri ve mortaliteleri hastane kayıtlarından araştırıldı.
Bulgular: Yenidoğan yoğun bakım ünitesinde yatırılan 116 bebek (%90,62) prematür iken, dokuz (% 7,03) bebek ciddi respiratuar distres sendromu (RDS) için surfaktan tedavisi aldı. Pnömoni, yenidoğanın geçici takipnesi veya RDS nedeniyle solunum sıkıntısı gelişen ve bu yüzden hastanede takip edilen 68 bebeğe ventilator desteği verildi. Plasental implantasyon bozukluğu olan annelerin bebeklerinin yenidoğan yoğun bakım ünitesinde yatış oranının yüksek olduğu gözlendi.
Sonuç: Annelerin doğum öncesi takiplerinin dikkatli yapılmasının yanı sıra, bu gebelerin üçüncü düzey yenidoğan yoğun bakım üniteleri olan merkezlerde doğum yapmaları da önemlidir.

Anahtar Kelimeler: Plasental implantasyon anomalisi, Yenidoğan, Gestasyonel yaşa göre küçük, Sıkıntılı solunum sendromu

Sorumlu Yazar / Corresponding Author

Dr Adnan Barutçu

Siyahgül mah., Belediye cad, Halfeti/Şanlıurfa
Tel: +905054960905

e-mail: adnan_barutcu@hotmail.com

Geliş tarihi / Received: 03.08.2019

Kabul tarihi / Accepted: 25.10.2019

DOI: 10.35440/hutfd.601144

Introduction

Placental implantation defects are the most important causes of antepartum vaginal bleeding. Ablasio placenta, placenta previa, adherent placentas such as accreate, increata, percreata are common placental implantation defects (1). The incidence appears to have increased in relationship to the increasing rate of cesarean deliveries. The incidence of accreate was increased from 1/30000 birth in 1950 to 1/553-2510 birth nowadays (2). Placenta previa is associated with numerous adverse maternal and fetal–neonatal complications. The most complications in neonates are premature birth, low birth weight, intrauterine asphyxia, infections, respiratory distress (3). The aim of this study is to determine its association with adverse maternal and neonatal outcomes.

Materials and Methods

Babies of the mothers with placental implantation defects followed in Çukurova University Department of Gynecology and Obstetrics in 2014-2015 were retrospectively sectional screened and involved in the study. Fetal loses, stillbirth fetuses, and live births were recorded. A diagnosis of placenta previa is recorded on vital statistics data when the maturing placenta obstructs or issituated in close proximity to the internal cervical os and is usually based on ultrasound scan localization of the placenta. The term placenta accreta was used where the placenta was attached directly to the uterine wall with no myometrial invasion. Multiple births were excluded taking into account that they can have many other complications that might add to the complications attributed to the placenta accreata independently.

Neonatal evaluation included Apgar scores, birth weight, resucitation in delivery room, respiratory distress, surfactant application, ventilator support, early and late onset neonatal sepsis, feeding tolerance, major anomalies and mortalities of the babies hospitalized in Çukurova University Neonatal Intensive Care Unit (NICU) were investigated from hospital records. This study was approved by the institutional ethics committee (Report Number: 63, 14 Apr 2017). There is not any sources of financial assistance.

Statistical Analysis

The data was analyzed using SPSS 20.0 software package for windows. Categorical variables were summarized as numbers and percentages while continuous variables were summarized as mean and standard deviation (median and minimum-maximum if necessary). Chi-square test was used to compare groups for categorical variables and continuous variables were compared using the t-test for normally distributed variables and the Mann-Whitney U test were used for non-normal distributed continuous data. A p-values less or equal to 0.05 were accepted as statistically significant.

Results

Total 274 mothers with placental implantation defects were revealed in two years. But 45 mothers did not come to obstetric policlinic follow-up and 12 infants were hospitalized to NICU of different hospitals so that record of them could not be reached. The rest of 217 babies of the mothers with placental implantation defects were included in the study. Twenty-four of them were fetal loss or stillbirth.

The mean gestational week and birth weight of 193 live births were 34,8±3,3 (min-max:23-40) weeks and 2642±815 (min-max:520-4600) gr respectively. The number of babies born under 38 weeks of gestation were 146 (76,1%). Sixty-five (33,7%) babies were given to mothers directly after birth while 128 (66,3%) babies were hospitalized in NICU. The mean gestational week of 65 infants that given to their mothers after birth were 37,5±1,1 (min-max:33-40) weeks and the mean birth weights of them was 3257±447 gr (min-max:1925-4440). The mean gestational week and birth weight of 128 infants hospitalized in NICU were 33,5±3,3 (min-max:23-39) weeks and 2337±778 gr (min-max:520-4600) (Table 1).

Table 1. The mean gestational week and birth weight of live births.

Total n= 193	Babies were given to mothers directly after birth n= 65	Hospitalized babies in NICU n = 128
	Mean±SD (Min-Max)	Mean±SD (Min-Max)
Birth weight (gr)	3257±447 1925-4440	2337±778 520-4600
Gestational age (week)	37,5±1,1 33-40	33,5±3,3 23-39

Nine (7,03%) of these 128 infants were SGA while 27 (21,09%) of them were LGA. Eight mothers of these SGA infants were multipar while one mother was nullipar. Three of these LGA infants had at least one hypoglycemic (<47 gr/dl) attack in first 24 hours of life. None of the mothers of LGA infants had diabetes mellitus or obesity. The number of premature infants hospitalized in NICU was 116 (90,62%) and 9 (7,03%) infants received surfactant treatment for severe respiratory distress syndrome (RDS). Also, there were 68 infants hospitalized for respiratory distress due to pneumonia, transient tachypnea of neonate, RDS had ventilator support. Thirty-two (25%) of 128 hospitalized infant had early onset sepsis (either suspected or proven), 6 (4,7%) of 128 infants had urinary tract infection. Fifteen infants (11,7 %) had congenital heart defects. Eight (6,2% of hospitalized, 4,14% of live births) of hospitalized infants were exitus (three infants were immature babies between 22-24 gestational weeks, two infants had severe congenital heart defects, one infant had severe pulmonary hypertension and two had nosocomial sepsis). The characteristics of 128 infants in NICU

are summarized in Table 2.

Mean starting day of enteral feeding of the infants who were discharged from NICU was 3,2±3,5 (min-max:1-18) days of life and the mean full enteral feeding of these infants was on 9,2±9,8 (min-max:1-60) days of life. Mean hospitalization days of 128 infants in NICU was 18,1±24,6 (min-max:1-188) days. None of the babies had abnormal neurologic finding at discharge. There was not any mother death in the study group.

Table 2. Characteristics of 128 babies that hospitalized in NICU

	n	(%)
SGA	9	7,03
LGA	27	21,0
Prematurity	116	90,6
Received surfactant treatment	9	7,03
Ventilator support (due to pneumonia, transient tachypnea of neonate, RDS)	68	53,1
Sepsis in neonatal period	32	25
Urinary tract infection	6	4,7
Congenital heart defects	15	11,7

SGA: Small for gestational age, LGA: Large for gestational age,
RDS: Respiratory distress syndrome

Discussion

Placental implantation defects are the major causes of ante partum haemorrhage in the third trimester of pregnancies and major contributors of obstetric haemorrhage in general.

One of the consequences of increasing cesarean delivery rates over the last 2 decades is an increase in placental implantation abnormalities including placenta previa, placenta accreta, vasa previa. In addition, many other factors like; maternal age >35, increased parity, existence of myomectomy history, endometrial defects, hysteroscopic surgery, pelvic radiation therapy, submucous leiomyoma can increase the risk (2). It is important to follow the pregnant who had previous cesarean delivery, for placenta implantation defects. Relatively decreased blood flow and avascularity-acelularity of the cesarean scar area might have a role in increasing of placental implantation defects after cesarean delivery (2).

Since placenta implantation defects can have catastrophic complications for both the mother and fetus, efforts have been focused on reducing maternal and fetal risk by not allowing the pregnancy to advance to term, thus resulting in preterm delivery. Placental implantation defects are the common cause for indicated preterm delivery, accounting for 5,6-8,7% of indicated preterm deliveries at <35 weeks' gestation (4).

Vahanian et al. (5) demonstrated that patients with placenta previa have a 5-fold increase in prematurity, NICU admission, and perinatal/neonatal death compared to patients without placenta previa. The incidence of preterm delivery was between 43,5%-57,7% in the same meta-analysis. In our study the incidence of preterm delivery was 76,1%. This higher ratio can be attributed to our university hospital being a centre for high risk pregnancies and neonates.

Ananth et al. (6) reported the neonatal mortality was 10,7 in 1000 live births of mothers with placenta previa while it is 2,5 in non-placenta previa. 4,14% of the live birth neonates in our study died. Birth weights of neonates of previa mothers were statistically smaller than neonates of mothers without previa in the same study. Kassem et al. (7) reported that 3,3% of neonates of mothers with placental implantation defects were SGA. In our study, 7,03% of neonates hospitalized in our NICU were SGA.

Raisanen et al. (8) found that SGA ratio was higher in previa and multipar mothers compared to previa and nullipar mothers. In our study eight mothers having SGA baby were multipar. On the other hand, Harper et al. reported that placenta previa did not have any effect on fetal growth (9). However, LGA ratio in our study was 21,1% and it is higher than any other previous reports in the literature. None of the mothers having LGA infants had diabetes mellitus or obesity.

Third trimester hemorrhages were risk factors for cerebral palsy (10-13). Furuta et al. (14) showed that massive bleeding from placenta previa at around 30 weeks of gestation may be a risk factor for CP, and requires neonatal follow-up. However other studies reported that placenta previa was not related to CP, but rather preterm delivery or SGA might have role in CP (10,11). None of our neonates had abnormal neurologic findings at discharge.

Respiratory distress is a common problem in neonates, particularly in preterm infants. Tsuda et al. (15) reported that TTN risk was higher even in 36-38 gestational weeks neonates of mothers with placental implantation defects. RDS incidence was 2,2% in the same study. Bekku et al. demonstrated higher RDS in 30-35 gestational weeks neonates of mothers with previa compared to non-previa (16,17). In our study 39,06% of neonates were hospitalized with respiratory distress and 9 (4,66% of live births) of them had surfactant therapy for RDS.

Tsuda et al. (15) reported that birth weight of neonates born from mothers with placental implantation defects was 2735±246 gr. Mean birth weight of our neonates was 2642±815 (min-max:520-4600) gr which is similar with literature. But Sing et al. (18) found the mean birth weight of neonates as 1859±941 gr and mean gestational week of birth as 31,9±5,9 weeks (18). Maternal death rate was 23,8% in the same study. We did not have any maternal death.

Kancherla et al. (19) demonstrated that congenital anomaly incidence in neonates of mothers with placental

implantation defects was 6,2%. This ratio was 3,8% in control group. Neri et al. (20) reported that the incidence of congenital heart defects was higher in neonates of mothers with previa. In our study, the incidence of major congenital heart defect was 11,7% in neonates admitted to NICU. This higher ratio can be due to that our hospital is a screening centre of fetal heart defects.

Park et al. (21) reported that previa related to cervical canal might be related to infection in neonates. Madan et al. (22) showed that 5,7% of previa with vaginal bleeding had infections. 25% of our neonates had early neonatal sepsis and six neonates had urinary tract infections

In conclusion, NICU hospitalization incidence is higher in neonates of mothers with placental implantation defects. As well as antenatal careful follow up of mothers, it is also important to give births in centers with third level neonatal intensive care units to overcome the neonatal morbidities.

No conflict of interest.

References

1. Kahyaoğlu S, Çelen Ş, Kahyaoğlu İ, Mollamahmutoğlu L, Danışman N. Plasenta yapışma anomalileri: Klinik yaklaşım ve yönetim Cumhuriyet Tıp Derg. 2013 ;(35):618-28.
2. Mehasseb MK, Konje JC (Çeviren; A. Baloğlu, B. Çetinkaya) Bölüm 10; Plasenta Anomalileri. In: A textbook of Postpartum Hemorrhage Ed:CB Lynch, LG Keith, AB Lalonde, M Karoshi (Doğum Sonu Kanama. Çeviri Ed: Cansun Demir, Selim Büyükkurt) 2010;76-89.
3. Berhan Y. Predictors of Perinatal Mortality Associated with Placenta Previa and Placental Abruption: An Experience from a Low Income Country. J Pregnancy. 2014;2014:307043.
4. Ananth CV, Vintzileos AM. Maternal-fetal conditions necessitating a medical intervention resulting in preterm birth. Am J Obstet Gynecol. 2006;195:1557-63.
5. Vahanian SA, Lavery JA, Ananth CV, Vintzileos A. Placental implantation abnormalities and risk of preterm delivery: a systematic review and metaanalysis Am J Obstet Gynecol. 2015;213(4 Suppl):78-90.
6. Ananth CV, Smulian JC, Vintzileos AM. The effect of placenta previa on neonatal mortality: A population-based study in the United States, 1989 through 1997 Am J Obstet Gynecol. 2003;188:1299-304.
7. Kassem GA, Alzahrani AK. Maternal and neonatal outcomes of placenta previa andplacenta accreta: three years of experience with a two-consultant approach. Int J Womens Health. 2013; 28:803-10.
8. Räisänen S, Kancherla V, Kramer MR, Gissler M, Heinonen S. Placenta previa and the risk of delivering a small-for-gestational-age newborn.Obstet Gynecol. 2014;124:285-91.
9. Harper LM, Odibo AO, Macones GA, Crane JP, Cahill AG. Effect of placenta previa on fetal growth. Am J Obstet Gynecol. 2010;203:330.e1-5.
10. Nelson KB, Ellenberg JH. Antecedents of cerebral palsy. Univariate analysis of risks. Am J Dis Child. 1985;139:1031–8.
11. Nelson KB, Ellenberg JH. Antecedents of cerebral palsy. Multivariate analysis of risk. N Engl J Med. 1986;315:81–6.
12. Spinillo A, Fazzi E, Stronati M, Ometto A, Capuzzo E, Guaschino S. Early morbidity and neurodevelopmental outcome in low-birth weight infants born after third trimester bleeding. Am J Perinatol 1994;11:85–90.
13. Matsuda Y, Maeda T, Kuono S. Comparison of neonatal outcome including cerebral palsy between abruptio placentae and placenta previa. Eur J Obstet Gynecol Reprod Biol. 2003;106:125–9.
14. Furuta K, Tokunaga S, Furukawa S, Sameshima H. Acute and massive bleeding from placenta previa and infants' brain damage. Early Human Development. 2014;90:455–8.
15. Tsuda H, Kotani T, Sumigama S, Mano Y, Hua L, Hayakawa H, et al. Effect of placenta previa on neonatal respiratory disorders and amniotic lamellar body counts at 36–38 weeks of gestation. Early Hum Dev. 2014;90:51-4.
16. Lin C, Wang S, Hsu Y, Lin Y, Yeh T, Chang F. Risk for respiratory distress syndrome in preterm infants born to mothers complicated by placenta previa. Early Hum Dev. 2001;60:215-24.
17. Bekku S, Mitsuda N, Ogita K, Suehara N, Fujimura M, Aono T. High incidence of respiratory distress syndrome (RDS) in infants born to mothers with placenta previa J Matern Fetal Med. 2000;9:110-3.
18. Singh R, Pradeep Y. Maternal and neonatal outcomes in morbidly adherent placenta: a developing country experience. Trop Doct. 2015;45:183-7.
19. Kancherla V, Räisänen S, Gissler M, Kramer MR, Heinonen S. Placenta Previa and Risk of Major Congenital Malformations among Singleton Births in Finland. Birth Defects Res A Clin Mol Teratol. 2015;103:527-35.
20. Neri A, Manor Y, Matityahu A, Blieden L. Placenta previa and congenital cardiac anomalies. Fetal Ther. 1989;4:138-40.
21. Park CW, Moon KC, Park JS, Jun JK, Yoon BH. The Frequency and Clinical Significance of Intra-Uterine Infection and Inflammation in Patients with Placenta Previa and PretermLabor and Intact Membranes. Placenta. 2009;30:613-8.
22. Madan I, Romero R, Kusanovic JP, Mittal P, Chaiworapongsa T, Dong Z, et al. The frequency and clinical significance of intra-amniotic infection and/or inflammation in women with placenta previa and vaginal bleeding: an unexpected observation. J Perinat Med. 2010;38:275–9.