

# Effect of Delivery Mode on the Perinatal Outcome in Twin Gestations

Evrım ERDEMOĞLU<sup>1</sup>, Ebru ERDEMOĞLU<sup>2</sup>, İsmet GÜN<sup>1</sup>, Tamer MÜNGAN<sup>2</sup>

<sup>1</sup>Ankara Mevki Military Hospital, Department of Obstetrics and Gynecology, Ankara, Turkey

<sup>2</sup>Zekai Tahir Burak Women's Health Training and Research Hospital, Department of Obstetrics and Gynecology, Ankara, Turkey

Received 14 September 2006; received in revised form 23 September 2006; accepted 26 September 2006;  
published online 20 October 2006

## Abstract

**Objective:** Aim of the study is to analyze effect of delivery mode on outcome of the twins.

**Materials and Methods:** Study consisted of 124 twin gestations, delivered at 25-41 weeks of gestation. Operative deliveries were excluded except breech extraction. Patients given a trial of vaginal delivery were included. Twins were delivered by abdominal route if the intertwin delivery time was >40 minutes, or for the following reasons; cord prolapse, fetal distress, and persistent transverse lie. The main outcome measure was first and fifth minute Apgar scores of twin A and B.

**Results:** Demographic, obstetrical characteristics and Apgar scores were similar in patients delivered abdominally and vaginally. There was 9.3% failed vaginal labor in twin B. Main significant factor influencing Apgar scores of both twin A and twin B was birthweight of <1500 gr ( $p<0.001$ ). Delivery mode and presentation did not effect Apgar scores significantly in both twin A and twin B.

**Discussion:** Caesarean delivery did not improve fetal outcome in twin gestations, and the only significant factor associated with depressed Apgar scores was found to be birthweight. Delivery mode and presentation were only considered significant in twins with a birthweight of <1500 gr.

**Keywords:** twin pregnancy, delivery mode, Apgar score

## Özet

### İkiz Gebeliklerde Doğum Şeklinin Perinatal Sonuçlara Etkisi

**Amaç:** Doğum şeklinin ikiz bebekler üzerine olan etkisinin araştırılmasıdır.

**Materyal ve Metot:** Gebeliğin 25-41. haftaları arasında doğurtulan 124 ikiz gebelik çalışmaya dahil edilmiştir. Makat doğum dışındaki operatif doğumlar çalışmaya dahil edilmemiştir. Vajinal doğum şansı verilmiş hastalar çalışmaya alınmıştır. Kordon prolapsı, fetal distres, kalıcı transvers duruş olan ve ikizler arası doğum süresi 40 dakikadan uzun olanlara abdominal doğum yapılmıştır. Ana sonuç ölçütü olarak ikiz A ve B'nin birinci ve beşinci dakika Apgar skorları alınmıştır.

**Sonuçlar:** Demografik, obstetrik karakterleri ve Apgar skorları normal doğum yapan ve sezaryen olan hastalarda benzerdi. İkiz B'de vajinal doğumların %9.3'ü başarısız olmuştur. İkiz A ve B'nin Apgar skorlarını etkileyen temel önemli faktör doğum kilosunun 1500 gr'dan küçük olmasıydı ( $p<0.001$ ). Doğum şekli ve prezentasyon hem ikiz A'da hem de B'de Apgar skorlarını etkilememekteydi.

**Tartışma:** İkiz gebeliklerde sezaryen doğum, fetal sonuçları etkilememekteydi ve düşük Apgar skorlarıyla ilişkili tek önemli faktör doğum kilosuydu. Doğum şekli ve prezentasyon sadece 1500 gr'ın altındaki ikizlerde önemliydi.

**Anahtar sözcükler:** ikiz gebelik, doğum şekli, Apgar skoru

## Introduction

Perinatal morbidity and mortality is increased in multiple gestations, particularly twin pregnancies and the preferred route of delivery for multiple gestations is controversial (1).

Traditionally, caesarean is the method of choice in non-vertex presenting twin A. Vaginal delivery is generally considered for vertex-vertex twins; however, optimal delivery mode of the non-vertex second twin is not established. We studied the effect of delivery mode on outcome of the twins.

## Materials and Methods

The study consisted of retrospective analysis of 124 twin gestations, delivered at 25-41 weeks of gestation. Compli-

**Corresponding Author:** Dr. Evrim Erdemoğlu  
Kıbrıs Sok. 25/3, Elçi Apt. Aşağıyayracı, 06690 Ankara, Türkiye  
**GSM** : +90 532 789 89 91  
**Fax** : +90 312 466 26 59  
**E-mail** : evrimmd@yahoo.com

cated pregnancies with hypertension, intrauterine growth retardation, twin-to-twin transfusion were excluded. Operative deliveries, external/internal version, except breech extraction were not included into the study, because all of the interventions carry their own risk for the fetus and the mother. Fetal presentations were verified by ultrasonography. Vaginal delivery was tried for all of the pregnancies included into the study. In cases of non-vertex twin A, vaginal delivery was tried in multiparous women. There was no planned caesarean section and all of the patients were managed in the active phase of the labor. Oxytocin induction was avoided and all of the patients were monitored intermittently by cardiotocography. There were no attempts to external version for non-vertex presenting twin A and twin B as a hospital protocol. Non-vertex twin B was delivered by breech extraction. As a hospital protocol, persistent transverse twin B was managed expectantly for a maximum of 40 minutes to turn to cephalic/breech presentation and internal version was not attempted. Twins were delivered by abdominal route if the intertwin delivery time was >40 minutes, or for the following reasons; cord prolapse, fetal distress, persistent transverse lie.

The main outcome measure was first and fifth minute Apgar scores of twin A and B. Obstetrical, demographical data, birthweight, Apgar scores, mode of delivery, newborn care were studied from obstetrical database and medical recordings.

### Results

Demographic and obstetrical characteristics of the patients are shown in Table 1. Presentation of twin A in 67.7% of patients was vertex, and 32.3% of twin A was non-vertex presentation. Twin B was 45.2% in vertex presentation and 54.8% in non-vertex presentation. In the twins, 74.2% of twin A and 76.6% of twin B were delivered by caesarean. There was not a statistically increased caesarean ratio for twin B ( $p=0.65$ ). By vaginal route, 25.8% of twin A and 23.4% of twin B were delivered, trial of vaginal labor failed only in 9.3% of twin B and these pregnancies were delivered by abdominal route. Caesarean indications of these failed vaginal births were cord prolapse (33.3%) and persistent transverse lie with an intertwin delivery time of >40 minutes (66.7%). The mean of first and fifth minute Apgar scores of babies delivered by caesarean vs. vaginal route is similar (Table 1). Factors associated with a depressed Apgar scores of <5 are shown in Table 2. Only birthweight of <1500 gr is associated with depressed first and fifth minute Apgar scores of twin A (OR:8.4 95%CI:1.60-43.50 and OR:53.37 95%CI:4.62-617.09 respectively) and twin B (OR: 10.89 95%CI:1.26-94.48 and OR:12.65 95%CI:1.96-81.81, respectively) in logistic regression analyses.

The interactions and main effects of delivery mode, birthweight of <1500 gr and presentation was further analyzed by univariate analysis of variance in general linear model (Figure 1 and Figure 2). Main significant factor influencing the Apgar scores of both twin A and twin B was only the

**Table 1.** Obstetrical characteristics of twins delivered by caesarean vs. vaginal delivery. The main outcome measure Apgar scores are similar in twins delivered by vaginal and abdominal route

	Caesarean delivery	Vaginal delivery	p value
Age	26.66±5.67	25.31±5.66	0.171
Gravida	2.26±1.45	2.24±1.09	0.629
Parity	0.91±1.26	1.069±0.998	0.211
Birthweight			
Twin A	2277±452 gr	2373±781 gr	0.533
Twin B	2228±441 gr	2260±665 gr	0.811
Gestational week	35.75±2.34	35.31±3.82	0.766
1' Apgar scores			
Twin A	5.80±1.02	5.79±1.57	0.338
Twin B	5.40±1.22	5.38±1.72	0.604
5' Apgar scores			
Twin A	7.69±1.04	7.66±1.97	0.245
Twin B	7.36±1.13	7.07±2.31	0.715

Student-t test and Mann-Whitney U test

birthweight of <1500 gr (Figure 1). Delivery mode and presentation did not effect the Apgar scores significantly in both twin A and twin B.

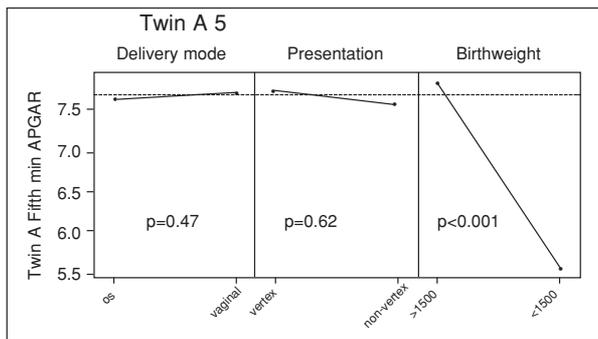
The only significant interaction affecting first and fifth minute Apgar scores of twin A was between birthweight and delivery mode ( $p=0.003$ ,  $p<0.001$  respectively); twin A of <1500 gr delivered by vaginal route had poorer Apgar scores than those delivered by caesarean (Figure 2A). Delivery mode was not important in twin A of >1500 gr. Interactions of presentation with the other measures was not significant for the first minute Apgar score of twin A; but we found important interactions with the fifth minute. Vaginal delivery of non-vertex twin A was a significant determinant of poor fifth minute Apgar score in these subgroups (Figure 2A,  $p=0.03$ ).

First minute Apgar score of twin B was only affected by birthweight of <1500 gr (Figure 1), and there were no statistically significant interactions of delivery mode, presentation

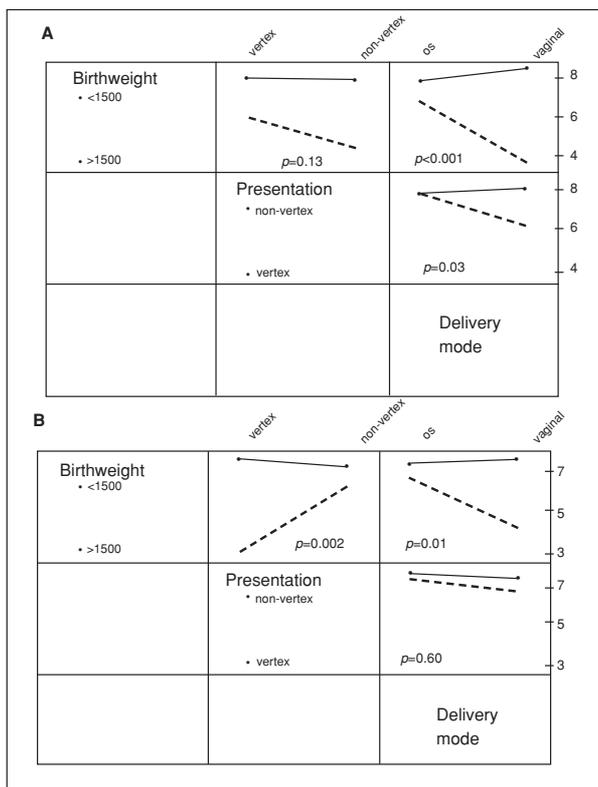
**Table 2.** Risk of depressed Apgar of <5 in twin A and twin B in relation to birtweight, presentation and delivery mode<sup>a</sup>

	1' Apgar <5			5' Apgar <5		
	OR	95%CI	p	OR	95%CI	p
Twin A						
Non-vtx	0.86	0.37-2.00	0.728	0.66	0.05-9.20	0.757
<1500 gr	8.34	1.60-43.50	0.012	53.37	4.62-617.09	0.001
VG delivery	0.62	0.24-1.59	0.318	1.70	0.16-17.78	0.658
Twin B						
Non-vtx	0.97	0.46-2.05	0.938	5.43	0.47-62.62	0.175
<1500 gr	10.89	1.26-94.48	0.03	12.65	1.96-81.81	0.008
VG delivery	0.49	0.20-1.23	0.127	4.25	0.61-29.60	0.144

<sup>a</sup>Logistic regression analysis



**Figure 1.** Main effects of delivery mode, presentation and birthweight on fifth minute Apgar scores of twins. The only significant factor associated with poor Apgar scores is birthweight of <1500 gr. The diagram is similar for the first and fifth minute Apgar scores of twin A and twin B.



**Figure 2.** Interactions of delivery mode, presentation and birthweight on fifth minute Apgar score of twins. A) 5' Apgar of twin A. Twin A <1500 gr or non-vertex presentation had poor Apgar scores if they are delivered vaginally. B) 5' Apgar of twin B. Vertex presented twin B of <1500 gr and vaginally delivered of twin B of <1500 gr are associated with lower Apgar scores. Cesarean offers no protection for the hazards in non-vertex second twin and twin B of >1500 gr.

and birthweight on first minute Apgar of twin B. However, we found significant interactions with fifth minute Apgar of twin B (Figure 2B); Vertex presented twin B had poorer Apgar scores when the baby was <1500 gr ( $p=0.002$ ) and

delivery of twin B <1500 gr by vaginal route was associated with lower Apgar scores ( $p=0.01$ ). Delivery mode was not important for non-vertex twin B ( $p=0.60$ ).

## Discussion

Twin gestations account for 10% of the perinatal mortality. Most aspects of intrapartum management and delivery of the twins are controversial (1). We studied the effect of delivery mode on the Apgar scores of twins and further analyzed the patients in non-vertex presentation and birthweight of <1500 gr.

The mode of delivery for the low twin <1500 gr is controversial, regardless of presentation (2,3). Ziadeh et al. reported that the differences in neonatal outcome are accounted by the birthweight, rather than mode of delivery (4). In our study, we found that the main measure effecting the Apgar scores was birthweight of <1500 gr. However, vaginal delivery was a risk factor for twins of birthweight <1500 gr and caesarean improved the fetal outcome in twins of <1500 gr and corrected the differences in neonatal outcome. Caesarean section is the optimal route of delivery for all twins expected to have birthweight <1500 gr (3).

Non-vertex presentation of twin A is usually considered as a caesarean indication (1), besides, there is a risk of locked twins in breech-vertex presentations (5). In singleton pregnancies, it is proposed that breech presentation alone is not an indication for caesarean section if the infant is >1500 gr (6). Blickstein et al. reported that vaginal birth was safe for breech presenting twin A in terms of depressed Apgar score and neonatal mortality, that weighed at least 1500 gr (7). A trial of vaginal birth for non-vertex twin A in multiparous women was tried unless the presentations were breech-vertex and the main factor effecting the outcome of twin A was found to be birthweight of <1500 gr in our study.

Delivery mode of the non-vertex second twin is uncertain. Some advocate caesarean rather than vaginal delivery in non-vertex twin B (8,9) however, others report that perinatal mortality and low-5 minute Apgar scores are not increased when the non-vertex twin B is delivered vaginally after the criteria for vaginal delivery of a singleton breech are met (10,11). Acker et al. reported that there is no statistically significant increased morbidity in vaginally delivered non-vertex twin B of >1500 gr (10). There are reports that external cephalic version is considerably successful in non-vertex twin B and it may reduce the caesarean rate (12,13). However, external cephalic version brings the risk of fetal distress, cord prolapse and compound presentation (14). It has been reported that these risks are not encountered in breech extraction and breech extraction may be the route of delivery for non-vertex twin B of >1500 gr rather than caesarean or external cephalic version (14,15) and we found that breech extraction could safely be performed for non-vertex presenting twin B.

In conclusion, delivery by caesarean did not improve the fetal outcome in twin gestations, and the only significant

factor associated with depressed Apgar scores was found to be birthweight. Delivery mode and presentation were only considered significant in twins with a birthweight of <1500 gr.

## References

1. Hogle KL, Hutton EK, McBrien KA et al. Caesarean delivery for twins: A systematic review and metaanalysis. *Am J Obstet Gynecol* 2003;188 (1):220-7.
2. Adam C, Allen AC, Baskett TF. Twin delivery: Influence of the presentation and method of delivery on the second twin. *Am J Obstet Gynecol* 1991;165:23-7.
3. Barret JM, Staggs SM, Van Hooydook JE et al. The effect of type of delivery upon neonatal outcome in premature twins. *Am J Obstet Gynecol* 1982;143:360-7.
4. Ziadeh SM, Badria LF. Effect of mode of delivery on neonatal outcome of twins with birthweight under 1500 g. *Arch Gynecol Obstet* 2000;264 (3):128-30.
5. Barret JFR, Ritchie WK. Twin delivery. *Best Practice & Research Clin Obstet Gynecol* 2002;16(1):43-56.
6. Brown L, Karrison T, Cibils A. Mode of delivery and perinatal results in breech presentation. *Am J Obstet Gynecol* 1994;171(1):28-34.
7. Blickstein I, Goldman RD, Kupferminc M. Delivery of breech first twins: A multicenter retrospective study. *Obstet Gynecol* 2000;95(1):37-42.
8. Rabinovici J, Barkai G, Reichman B, Serr DM, Mashiach S. Randomized management of the second nonvertex twin: vaginal delivery or caesarean section. *Am J Obstet Gynecol* 1987;156:52-6.
9. Winn HN, Cimino J, Powers J. Intrapartum management of nonvertex second-born twins: a critical analysis. *Am J Obstet Gynecol* 2001;185:1204-8.
10. Acker D, Lieberman M, Holbrook H, James O, Phillippe M, Edelin KC. Delivery of the second twin. *Obstet Gynecol* 1982;59:710-1.
11. Evrard JR, Gold EM. Caesarean section for delivery of the second twin. *Obstet Gynecol* 1981;57:581-3.
12. Kaplan B, Peled Y, Rabinerson D et al. Successful external version of B-twin after the birth of A-twin for vertex-non-vertex twins. *Eur J Obstet Gynecol Reprod Biol* 1995;58(2):157-60.
13. Ben-Arie A, Kogan S, Schachter M et al. The impact of external cephalic version on the rate of vaginal and caesarean breech deliveries: a 3-year cumulative experience. *Eur J Obstet Gynecol Reprod Biol* 1995;63(2):125-9.
14. Gocke SE, Nageotte MP, Garite T et al. Management of the nonvertex second twin: primary caesarean section, external version, or primary breech extraction. *Am J Obstet Gynecol* 1989;161(1):111-4.
15. Smith SJ, Zebrowitz J, Latta RA. Method of delivery of the nonvertex second twin: a community hospital experience. *J Matern Fetal Med* 1997;6 (3):146-50.



**Online manuscript  
submissions  
and peer review  
(Journal Agent)**

Now available at  
**J Turkish German Gynecol Assoc**  
**www.jtgga.org**

[www.journalagent.com](http://www.journalagent.com)