

Twin Vaginal Deliveries: Impact of Delivery Time Interval on Twin B

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Research Article

Keywords: Twin pregnancy, Vaginal delivery, Birth weight, Perinatal, Twin delivery interval, Cesarean

Posted Date: May 7th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-386147/v1>

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Abstract

Background:

A vaginal twin delivery is a natural commonplace occurrence, but which can sometimes present a concern which may require action. Recently, the delivery time interval has been recognized as a variable that can be helpful for its safe conduct.

Objectives:

To view the delivery time interval in an obstetric population undergoing a twin vaginal trial of labor in consecutive deliveries during a specified time period.

Study Design:

A retrospective observational cohort of twin vaginal trials of labor was investigated to view the delivery time interval and its association with other factors, such as birth weights and the need for cesarean delivery of the second twin. The twin deliveries were divided into 2 groups, those with a delivery time interval of ≤ 30 minutes (Group A) and those with a delivery time interval of > 30 minutes (Group B), in a single institution.

Results:

No perinatal outcome difference was found between Group A (248 patients) or Group B (72 patients). However, 13 patients in Group B required a cesarean birth for a safe delivery, and 3 patients in Group A. The birth weight difference between each Baby A and Baby B varied according to the delivery time interval.

Conclusion:

The delivery time interval for vaginal twin deliveries may be useful to predict the need for a cesarean delivery of the second twin. The birth weight difference between Baby A and Baby B may be responsible for this finding.

Introduction

The status of the second twin may be of concern during a vaginal delivery, and the twin delivery time interval (DTI) may be pertinent to this. There may be a relatively worse perinatal outcome of the second twin at vaginal delivery, possibly correlating to the DTI of those vaginally delivered liveborn twins.¹⁻⁵ Though at cesarean delivery, this interval is negligible, yet for a vaginal delivery, there can be a considerable delay of delivery of Baby B (the second twin). When speaking of a delayed delivery of the second twin, however, the delay spoken of in this report, is on the order of minutes or hours, not days as can sometimes occur preterm.⁶ Although there can be multiple ways of measuring perinatal outcome,

since the assessment of cord pH has not been uniformly performed at our institution over the years, the most consistent and clinically meaningful measure for the purpose of this investigation is the 5-minute Apgar score as the perinatal outcome measurement tool. The institution's data set of vaginal deliveries over the past couple of decades offers an ability to review its experience, possibly identifying guidelines as to the optimal inter-twin delay that should be best tolerated. This has been explored within the medical literature, but with no definitive conclusion.³ So, the authors sought to explore the dataset of this institution, contained in its Structured Query Language (SQL) perinatal database (PG Works) to possibly identify an answer to this question.

Methods

A SQL perinatal database was used to extract and analyze the perinatal data regarding all term and near term (≥ 34 weeks of gestation) liveborn vaginal twin deliveries, from January 1, 1992 through December 31, 2019. The parity, birthweight, delivery time, Apgar scores, delivery types, Neonatal Care Unit Admissions (NICU) admissions, and need for a cesarean delivery for the second twin were reviewed. The chorionicity of the twin gestations were not consistently noted in the medical record and therefore not reflected in this report. Group A includes the twins for whom the DTI was ≤ 30 minutes, and Group B includes the twins for whom the DTI was > 30 minutes. Analysis of the 5-Minute Apgar scores of these groups were calculated. A t-test statistical analysis was performed on the parametric data (e.g., birthweight), and a Chi square and Fisher Exact analysis was performed for the dichotomous data. Approval from the Advocate IRB was obtained for this retrospective investigation.

Results

In our institution, 320 term and near term (≥ 34 weeks of gestation) vaginal liveborn twin births occurred from January 1, 1992 through December 31, 2019. In this same population, 248 babies delivered ≤ 30 minutes (DTI) as the second twin, while 72 delivered with a DTI > 30 minutes. Most deliveries appear to have been performed in the operating room as a double setup. Sixteen twins delivered by Cesarean, as the discordant 2nd twin delivery. It should be noted that each of the A twins had a cephalic presentation, and it was ultimately determined that the B twins had a cephalic or breech or transverse presentation after delivery of twin A. Most of those breech presenting births were delivered by vaginal-assisted breech. The number of cases for which external cephalic version (ECV) was attempted (or successful) on twin B was not documented in this report. Notation in the medical record was not consistently made as to the presentation of twin B. In Group A, the number of babies with a 5-minute Apgar of the 2nd twin that was < 7 was 4, whereas in Group B, the number of babies with a 5-minute Apgar of the 2nd twin that was < 7 was 2. A Fisher exact statistical comparison yielded a $p = 0.31$. There was no significant difference of the number of NICU admissions between the two groups. Thus, neonatal harm was not found regarding the DTI. The number of nulliparous moms in this population was 119 (37%), and there was no significant difference in the nulliparous parturients between the A and B groups. These data can be seen in Table 1.

Table 1
Twin Data for Group A and Group B

	Group A	Group B	<i>p</i>
Number of cases	248	72	
DTI mean	21 minutes	78 minutes	
DTI range	1–30 minutes	31–468 minutes	
Discordant delivery (Cesarean for twin B)	3 (1.2%)	13 (18%)	< 0.001
Birthweight of 2nd twin, mean	2519 grams	2631 grams	0.13
5-minute Apgar of 2nd twin < 7	4 (1.6%)	2 (2.8%)	0.31
NICU admissions of 2nd twin	90 (36.3%)	28 (39%)	0.8
DTI = Delivery Time Interval			
NICU = Neonatal Intensive Care Unit			

Considering the Group B second twins (those with a DTI of > 30 minutes), the average birthweight was 2631 grams, whereas for Group A, the average birthweight of the second twin was 2519 grams. This 137-gram average birthweight twin discrepancy was 5% of the A Group average birthweight. The birthweight difference between baby A and baby B for each twin delivery in this cohort was computed, and then sorted into the two groups (see Fig. 1). If the birthweight of twin A was greater than twin B, B minus A had a negative value, and if twin A was smaller than twin B, that value was positive. The birthweight difference for Group A was - 53 grams, while for Group B, it was + 77 grams ($p = 0.06$). Of the 72 Group B second twins, 13 (18%) required a cesarean delivery for the second twin birth, as compared to 3 (1.2%) of Group A. The need for cesarean delivery for the second twin birth may be related to this birthweight difference. The indications for the cesareans performed are listed in Table 2.

Table 2
Indications for Cesareans performed.

Date	Indications
7/16/1996	36 weeks, unknown presentation of twin B
5/5/1998	Fetal compromise
6/13/1998	37 weeks, unknown presentation of twin B
6/20/2003	36 weeks, unknown presentation of twin B
6/29/2005	Cord prolapse of Twin B
9/9/2008	37 weeks, unknown presentation of twin B
10/9/2008	Twin B transverse lie
4/24/2009	Twin B Fetal compromise
5/14/2009	Twin B transverse lie
10/13/2009	Funic presentation, Breech & fetal compromise
9/12/2011	Twin B frank breech
6/19/2012	Twin B cord prolapse
6/27/2012	Twin B single footling breech
5/1/2015	Twin B fetal bradycardia
2/26/2017	Failed External Cephalic Version, transverse presentation
10/30/2019	Frank breech, cord prolapse

Discussion

Though in some medical literature, it has been shown there is somewhat lessor perinatal outcome of the 2nd vaginally delivered twin with a DTI of greater than 30 minutes, yet in this case series there was no such conclusion. However, the number of discordant deliveries (i.e., vaginal-cesarean) may be worthy of note, in that **18%** of those having a DTI > 30 minutes required a cesarean mode of delivery to provide a safe birth of the second twin, rather than 5% of the total cohort.

When vaginal delivery is not medically contraindicated, a term twin vaginal delivery should be considered, as evidence shows that no route of delivery has any advantage over the other in most circumstances.⁷ In spite of this, a trend towards an increasing rate of scheduled cesarean deliveries for twin gestations has been seen.⁸ As the twin delivery time interval between vaginal twin births can vary, one can consider a delay of greater than 30 minutes for the second birth, as potentially concerning. Though attendance to perinatal well-being is always needed during the supervision of a course of any labor, there is the

additional concern of a potentially discordant birth. Approximately 4–5% of twin vaginal trials of labor (VTOL) require a cesarean for the second twin birth.^{9,10} According to this current case series, a DTI of > 30 minutes may indicate the need for cesarean delivery in 18 % of those cases, as opposed to its 5% risk within the entire data set of 320 cases. These findings may have implications for those hospitals requiring sufficient lead time for assembling an operative team which may be necessary to perform a cesarean delivery.

The weakness of this work lies in the limited size of the studied population. As can be seen in the reported results, statistical significance was not evidenced for the perinatal outcome, and the difference between the groups only approached significance ($p = .06$). If the same comparison of birthweight differences of twins, with regard to DTI, is conducted in a larger population, statistical significance could possibly be found. The strength of this investigation, however, rests with the ability to identify the variables important in this common and appropriate procedure of vaginal twin deliveries.

Though the estimated fetal birthweight (EFW) of the second twin, compared to that of the first twin, may contribute to the DTI, sufficient antepartum sonographic resolution may be inadequate to make a prediction for the vaginal twin birth. Therefore, alertness and consideration of the DTI is necessary while performing a twin vaginal delivery.

Declarations

No funding provided

Conflicts of interest – none

Data is from the hospital's electronic medical record system, and its proprietary

Structured Query Language (SQL) perinatal information system

Ethics approvals obtained

Advocate IRB 1605593-1 (Exempt)

Consent for participation or publication: not applicable

Authors' contributions:

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Project development, data collection and analysis, reference checking, manuscript writing and editing

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Manuscript writing and editing

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Acknowledgements:

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For Data entry and analysis of twins in departmental SQL system

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Figures

Twin Birthweight Difference (B – A)

Associated with Delivery Time Interval ≤ 30 minutes and DTI > 30 minutes

[320 Twin Pair Vaginal Deliveries]

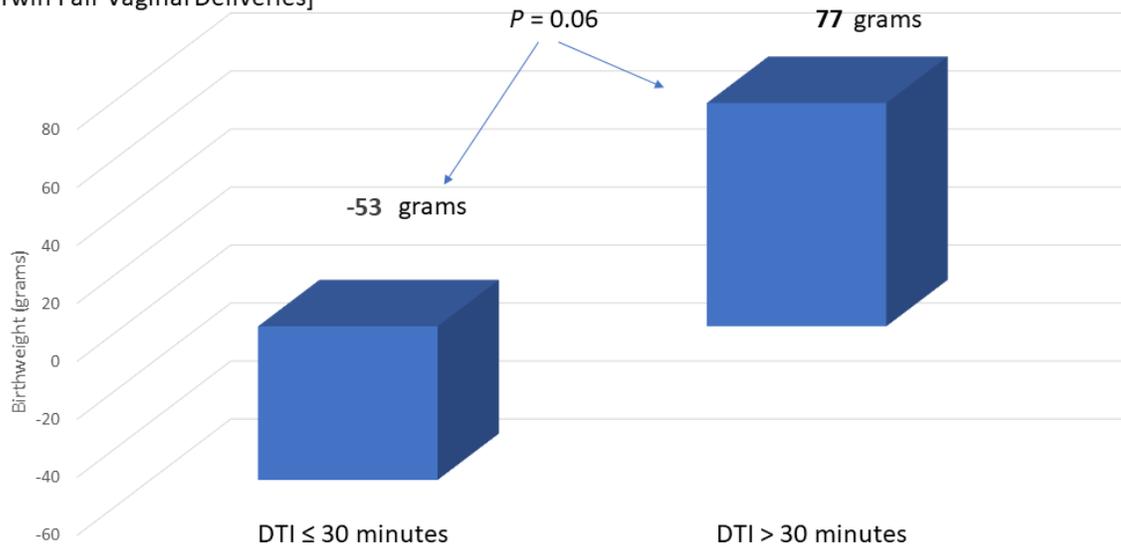


Figure 1

Twin birthrate difference