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## OBSTETRICS

# Discordant Twins in King Chulalongkorn Memorial Hospital: 6 Years Review of Incidence and Outcomes

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**ABSTRACT**

**Objective** To evaluate incidence and outcome of discordant twins in King Chulalongkorn Memorial Hospital, and assess the relationship between pregnancy outcomes and twin intrapair birth weight differences.

**Study design** Retrospective descriptive study.

**Setting** Department of Obstetrics and Gynaecology, King Chulalongkorn Memorial Hospital.

**Methods** Five hundred and nineteen twin gestations over 20 weeks of gestation during six-year period ending in December 2000 were retrospectively analyzed. Incidence and outcome of discordant twins were assessed based on birth weight difference more than 20 %. All twin pairs were stratified subsequently into five categories according to the percent difference of infant birth weight. The relationship between different categories and the subsequent pregnancy outcome were assessed. Statistical analysis was done using the Mantel-Haenzel $\chi^2$ test.

**Result** Among 519 twin pairs, thirteen patients were identified to have single fetal demise and two patients were documented to have dead fetuses of both twin pairs. Incidence of discordant twins was 19.6% and greater birth weight difference was significantly associated with cesarean section rate ($p = 0.03$). Neonatal mortality, neonatal intensive care admission, and low APGAR score were all associated with higher birth weight difference. ($p < 0.001$).

**Conclusion** Incidence of discordant twins based on the birth weight difference more than 20 percent in King Chulalongkorn Memorial Hospital was 19.6%, which corresponds to other studies. In our study, we found that trend of poor neonatal outcomes related to high intrapair birth weight differences.

**Key words:** discordant twins, perinatal and neonatal outcome

Unequal size of twin infants could be a sign of pathologic growth in one fetus and is most often defined by using the larger twin as the standard for growth. As the weight difference of a twin pair increases, perinatal mortality and morbidity also increase.[1,2] Although detection of significant growth difference within a twin pair by using serial ultrasound has become a mainstay in the treatment of twin gestations, there is uncertainty as to what birth weight difference is clinically significant.

Several reports emphasize detection of discordant twins by using ultrasound, but there are few recent studies focused on the significance of actual birth weight difference within a pair. The

existing studies present conflicting conclusion. In many studies, discordant fetal growth has been defined as a birth weight difference of 15% to 25%[1,3,4] and the incidence of discordance has been reported to occur in 15% to 29%[2,5] of twin gestations. There is still no standardized definition of fetal growth discordance on the basis of fetal weight differences, thus, the incidence varies upon the definition used for discordancy. In this study we evaluated incidence and outcomes of discordant twins in King Chulalongkorn Memorial Hospital, and assess the relationship between pregnancy outcomes and twin intrapair birth weight differences.

## Materials and methods

All twin gestations over 20 weeks of gestation who were managed and delivered at King Chulalongkorn Memorial hospital between January 1995 and December 2000 were retrospectively analyzed. For a study with 80% power and significance at the 5% level, a sample size calculation required 495 women in this study. Data were reviewed from the obstetric database. Perinatal and neonatal data were reviewed from individual hospital charts. Gestational age was established on the basis of last menstrual period and if uncertainty existed, by ultrasonography. The difference in percent was calculated from the larger twin as ;

$$\text{Birth weight difference (\%)} = \frac{(\text{Birth weight of larger twin} - \text{birth weight of smaller twin}) \times 100}{\text{Birth weight of larger twin}}$$

The case of single fetal demise and both twins dead were excluded from the study. Incidence and outcomes of discordant twins were assessed. Birth weight discordance was defined as a >20% difference in birth weights.[3] All twin pairs were stratified subsequently into five categories according to the percent difference in infant birth weight. The relationship between different categories and the subsequent outcomes were assessed including

Fetal outcomes

a. perinatal and neonatal mortality
b. neonatal intensive care unit ( NICU ) admission
c. 5-minute APGAR score

Maternal outcome

a. maternal pregnancy-induced hypertension

Preterm birth was defined as any delivery, regardless of birth weight that occurs before 37 completed weeks from the first day of last menstrual period.[6] Mantel-Haenzel $\chi^2$ (Chi-square for trend) was used to compare a trend across difference categories of maternal and neonatal outcomes. A p value $< 0.05$ was considered significant.

## Results

A total of 519 women with twin pregnancy delivered during the study period, and they accounted for 1% of all women who delivered at our hospital. In 13 twin gestations, one fetus per pair died, and in 2 pregnancies, both fetus died. The remaining 504 patients delivered live fetuses of both twin pairs and were analyzed for neonatal mortality, ICU admission and 5-minute APGAR scores.

Of 504 twin gestations studied 280 ( 55.5%) were nulliparous. The mean maternal age was 25.4 years (range 16-40),and the mean gravida was 1.8 (range 1-5). Mean birth weight of twin A and B were 2300 and 2250 g respectively, and mean gestational age was 36.4 weeks. The birth weight below 2500 grams occurred in 52 % of the infant. Preterm birth rate was found to be 39.5%. Pregnancy induced hypertension was encountered in 21.4 %. Presentation at birth for twin A and B were cephalic/cephalic in 53.6 %, cephalic/ non-cephalic in 27.9 % and both twins were non-cephalic presentation in 8.7 %. Cesarean section rate was found to be 64.3 %. The average delivery interval between deliveries of twin A and B was found to be 14.6 minutes (range 1-82). Incidence of discordant twins based on the birth weight difference more than 20 % in King Chulalongkorn Memorial Hospital was 19.6%, and the characteristics of this group were shown

in table 1.

Table 2, 3 and Figure 1 show obstetric outcomes by percentage of birth weight differences within a twin pair, according to five study categories. Fifty-one percents twin pair birth weights were within 10 % of each other. Neither preterm birth nor fetal presentations was not significantly associated with higher birth weight differences. Cesarean section rate and maternal hypertension were associated with intrapair twin birth weight differences (p = 0.03 ). We compared all groups of neonatal outcome and found that the frequency of low APGAR score (<7) in fetuses was significantly associated with higher birth weight differences (p <0.001 ). The incidence of NICU admission and neonatal mortality rate was also significantly associated with higher birth weight difference (p<0.001 ).

**Table 1.** Incidence and characteristics of discordant twins base on the birth weight difference more than 20 percent

| characteristics | Birth weight difference ( percent ) | | P value |
|---|---|---|---|
| | < 20 % | > 20 % | |
| Number | 405 (80.4%) | 99 (19.6%) | |
| Gestational age < 37 wks | 151 (37%) | 48 (48%) | 0.04 |
| Noncephalic/cephalic presentations | 189 (47%) | 45 (45%) | 0.74 |
| Cesarean delivery | 258 (63%) | 66 (67%) | 0.58 |
| Pregnancy induced hypertension | 75 (19%) | 33 (33%) | 0.001 |

Data are given as n (%).

**Table 2.** Maternal Outcome for 504 Women With Twins According to Percentage of Birth Weight Difference

| Outcome | Birth weight difference | | | | | P value |
|---|---|---|---|---|---|---|
| | < 10 % | 10-15% | 16-20% | 21-25 % | > 25 % | |
| No. of women | 259(51) | 98(20) | 53(10) | 47(9) | 47(9) | |
| Gestational age < 37 wks | 97(37) | 39(40) | 18(34) | 22((47) | 23(49) | 0.13 |
| Noncephalic/cephalic presentations | 114(44) | 47(48) | 28(53) | 21(45) | 24(51) | 0.34 |
| Cesarean delivery | 152(58) | 67(68) | 39(73) | 32(68) | 33(70) | 0.03 |
| Pregnancy induced hypertension | 42(16) | 24(24) | 9(17) | 14(30) | 19(40) | <0.001 |

Data are given as n (%).

**Table 3.** Neonatal Outcome for 1008 Twin Fetus According to Percentage of Birth Weight Difference

| Outcome | Birth weight difference | | | | | P value |
|---|---|---|---|---|---|---|
| | < 10 % | 10-15% | 16-20% | 21-25 % | > 25 % | |
| No. of fetus | 518 | 196 | 106 | 94 | 94 | |
| Neonatal mortality | 5(0.9) | 1(0.5) | 2(1.9) | 5(5.3) | 12(12.7) | <0.001 |
| NICU admission | 56(10.8) | 24(12) | 12(11) | 11(11.7) | 28(30) | <0.001 |
| 5-minute APGAR <7 | 7(1.4) | 1(0.5) | 2(1.9) | 4(4.2) | 9(9.5) | <0.001 |

Data are given as n (%).

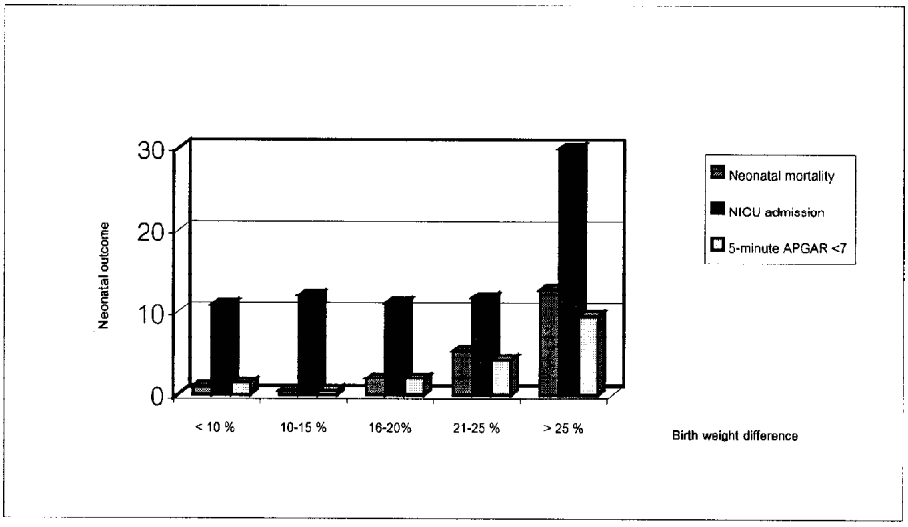



**Fig. 1.** Neonatal outcome according to percentage of birth weight difference.

## Discussion

A twin gestation is generally considered to be a high-risk pregnancy, the addition of discordant fetal growth adds the potential for further complications. The incidence of clinical significant discordant depends on the definition used and has been reported to be in the range of 15% to 29 %.[2,5] The threshold for discordant growth remains controversial,[3,5] however, in general the birth weight difference of 15 or 25% has been widely used with some clinical correlates to support of this definition.[1,4,7] In our study, we found that the incidence of discordant twins in King Chulalongkorn Memorial Hospital based on >20% birth weight difference was 19.6%.

Compared with those with singletons, the incidence of preclampsia was significantly increased in pregnant women with twins (13 vs 6 percent).[8] Moreover, women with twins and hypertensive disorders due to pregnancy experienced higher rates of adverse neonatal outcomes than those with singletons. In our study, we found that maternal hypertension was associated with higher birth weight difference, conversely to Lisa et al.[9] Pathophysiology of this difference cannot be clearly explained. Moreover, we suspected that higher birth weight difference could possibly be the cause, not the result.

An increasing discordance seem to relate with poor fetal prognosis. Discordancy in twin birth weights is generally discussed in association with twin-twin transfusion syndrome, a clinical condition characterized by placenta vascular anastomoses[10] and often found in conjunction with monochorionic twinning.[11] The occurrence of birth-weight discordancy in dizygotic twins has been described. Eberle et al,[3] in a study of the relationship between placentation and birth weight, observed the large intra-pair differences were found in dichorionic monozygous pairs. The observations do suggest that factors other than fetal transfusion syndrome are responsible for the marked birth weight dissimilarities. Unfortunately, data of chorionicity was not completely documented in our study. However, we found that an increasing discordance caused significantly increasing in perinatal mortality, neonatal intensive care admission and low APGAR score ( $p < 0.001$).

Not only is the clinical significance of actual twin birth weight differences controversial, but the threshold for significant intrapair birth weight discordance is also disputable. Early reports on twin discordance focus primarily on detection using

ultrasound, and discordance exceeding 15% was generally deem pathologic.[1,12] Others argued that only much larger intrapair differences in fetal size were associated with adverse outcome.[13,14] Our results indicated that there was positive relationship between poor neonatal outcomes and percentage of birth weight difference. However, the definite significant level cannot be established in this study due to inadequate sample size.

In conclusion, we propose higher birth weight difference level to be distinctive of poor outcomes in twin gestations. The standard significant level should be determined by further prospective studies.

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