

Determinants of Perinatal Mortality in Twins at Ibadan

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Abstract

Context: Twinning being a very important high-risk condition in our environment requires detailed study. There are several studies reviewing factors in twin perinatal mortality in our environment but there is a need to ascertain the relative contributions of each of these factors.

Objectives: To assess the relative contributions of maternal and fetal factors to perinatal mortality in twins.

Materials and Methods: Data was extracted from the birth register of a Nigerian tertiary health institution to identify maternal and fetal factors associated with a higher risk of perinatal mortality.

Outcome Measures: Perinatal deaths among twin pairs (ranked).

Results: The twinning rate was 32.3/1000(3.2%). Risk of perinatal death had linear correlation with birth asphyxia ($r = 0.412, p < 0.01$), birth weight of the second twin ($r = 0.358, p < 0.01$), birth weight of the smaller twin ($r = -0.344, p < 0.01$), presence of birth weight discordance ($r = 0.278, p < 0.01$), gestational age at delivery ($r = -0.211, p < 0.05$), birth weights of first and larger twins ($r = -0.275, p < 0.01$) and ($r = -0.206, p < 0.05$) respectively. The maternal age and parity showed no significant correlation with risk of perinatal death.

Conclusion: Birth asphyxia was the greatest predictor of perinatal death in twins among the variables studied.

Key Words: Twins, Birthweight Discordance, Perinatal Mortality [Trop J Obstet Gynaecol, 2002, 19: 00-00].

Introduction

Twin pregnancies are very common in our environment increasing risks to both mother and babies. The high incidence in this environment is well documented^{1,2,3,4}. It is therefore relevant to continue to study this very important contributor to perinatal morbidity and mortality^{5,6}. Several factors contributing to perinatal morbidity and mortality have been studied in twins. These include prolonged inter-twin delivery interval⁷, low birth weight especially in discordant pairs^{5,6} and twin birth weight discordance^{8,9}. The second twin is particularly prone to asphyxia and neonatal or perinatal death⁷. This study aims to analyse the relative contributions of some obstetric and fetal factors to perinatal mortality in twins.

Materials and Methods

An analysis of twin births occurring at the University College Hospital, Ibadan between 1st January, 1991 and 31st December, 2000 was conducted by retrieving data from the institution's birth register. Of the 9589 births in this period, 307 twins were delivered. For the purpose of this analysis, 189 records were utilized because of insufficient information and missing records of the other cases. Data on maternal age, parity, gestational age at delivery, fetal outcome, birth weight and Apgar scores were entered into a standard profoma. The variables were coded and entered into the SPSS version 10 and EPI-INFO version 6.04 software on an IBM Compatible Computer. Analysis was done using the Spearman's (non-parametric)

correlation statistic and 95% confidence intervals (CI) were calculated as appropriate. Where probability values were computed, the statistical level of significance was set at $p < 0.05$.

Results

In this study, the twinning rate was 32.3 per 1000 and the overall perinatal mortality rate was 158.7 per 1000.

Table 1 shows background information of the population studied. The mean maternal age was 27.90 years (95% CI: 27.3-28.5). Women in the age group 25-29 years were in the majority, accounting for 45.5% of the population studied. Only 0.5% of women were above 40 years of age and more than 80% of the women had a parity of 2 or less. Grandmultiparous women accounted for only 4.2% of the study population.

Concerning birthweights, the mean birth weight of the first twin was 2.18 kg while that of the second twin was 2.04 kg. The mean birthweight of the smaller twin in all the pairs was 1.98 kg while the mean birth weight of the larger twin was 2.30 kg.

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Table 1**Maternal Age and Parity**

Parameter	Number of Patients (%)
Age	
16 – 20	9 (4.8)
21 – 24	28 (14.8)
25 – 29	86 (45.5)
30 – 34	49 (25.9)
35 – 39	16 (8.5)
40 years	1 (0.5)
Total	189 (100)
Parity	
0	67 (35.5)
1	50 (26.5)
2	39 (20.6)
3	15 (7.9)
4	10 (5.3)
≥ 5	8 (4.2)
Total	189 (100)
Mean Age (95% CI):	27.9 (27.3-28.5)
Mean Parity (95% CI):	1.55 (1.33-1.77)

Table 2 shows the Spearman's correlation of the variables with perinatal death as the dependent variable. In order to create this matrix, certain variables were ranked. Asphyxia was defined as Apgar scores less than 7 and it was ranked as 0, 1 or 2 if none, one or both twins were asphyxiated in each pair. Perinatal death was ranked as 0, 1 or 2 if none, one or both twins were stillborn or died within 7 days of birth.

Perinatal death correlated negatively with the gestational age of delivery ($r = -0.211$, $P < 0.05$). This signifies that the lower the gestational age at delivery, the higher the order of perinatal death recorded. Asphyxia and perinatal deaths (both ranked variables) correlated positively ($r = 0.412$, $P < 0.01$), indicating that increasing asphyxia led to increasing perinatal deaths.

Variables derived from the birth weights all correlated with perinatal death. The birth weight of the second twin correlated negatively ($r = -0.358$, $P < 0.01$), indicating that the smaller the second twin, the greater the degree of perinatal death. Birth weight of the first twin ($r = -0.275$, $P < 0.01$), mean birth weight of both twins ($r = -0.340$, $P < 0.01$), birth weight of the larger twin ($r = -0.206$, $P < 0.05$) and birth weight of the smaller twin ($r = -0.344$, $P < 0.01$), all correlated

negatively with perinatal death, showing that the smaller these variables, the greater the risk of at least one twin dying in the pair involved. In this study, although the second twin had a higher perinatal mortality of 343 per 1000, this was not significantly higher than that of the first twin which was 281 per 1000 ($\chi^2 = 0.24$, $P = 0.62$).

Table 2**Correlation Between Perinatal Deaths and Clinical Variables**

Parameter	Spearman's Correlation Coefficient (r)	p
Maternal Age	-0.127	NS
Gestational Age at Delivery	-0.211	< 0.05
Parity	-0.101	NS
Birth Weight 1 st Twin	-0.275	< 0.01
Birth Weight 2 nd Twin	-0.358	< 0.01
Mean Birth Weight (Both Twins)	-0.340	< 0.01
Birth Weight (Larger Twin)	-0.206	< 0.05
Birth Weight (Smaller Twin)	-0.344	< 0.01
Asphyxia	0.412	< 0.01
Discordance	0.278	< 0.01

NS: Not statistically significant

Birth weight discordance was defined as the difference in birth weights of the twins being 20% of the birth weight of the larger twin. It was ranked as 0 for concordant pairs and 1 for discordant pairs. It showed positive correlation ($r = 0.278$, $P < 0.01$) with perinatal death, indicating that birth weight discordance increases risk of perinatal deaths.

Discussion

The twinning rate in this study is 32.3 per 1000 which is similar to findings of other studies in Nigeria^{1,2,3,4} with a twinning rate of between 30 – 45 per 1000. The retrieval of about 61% of the records of the total twins delivered in this study period may have some effects on the accuracy and applicability of the findings but the information is still useful in identifying risk factors for further evaluation in prospectively obtained data. The perinatal mortality rate is quite high in this study compared with figures from developed countries^{1,2}, but within the range of figures usually quoted from developing countries^{8,14}. The common factors associated with significant perinatal mortality in this study were low gestational age at delivery, birth weights of the babies, especially those

of the second and smaller twins, which showed the greatest correlation with mortality. The mean birth weight of the two babies also had a correlation with perinatal death as did birthweight discordance.

Among all the variables however, birth asphyxia showed the strongest correlation with perinatal death ($r: 0.412, P < 0.01$). This would suggest either a causal relationship or that similar factors cause both asphyxia and perinatal deaths. These findings are similar to finding in other studies which focused on these factors singly or in groups^{5,6,8,9}. It is therefore possible to reduce perinatal mortality by reducing the

incidence of birth asphyxia and low birth weight. It is possible to estimate to a reasonable degree the birth weight of fetuses prenatally hence; adequate preparations should be made before the low birth weight babies are delivered. Preterm labour should be managed aggressively in twin births knowing that reducing the incidence of preterm deliveries increases the chances of survival for the twins. The main reason for the differences in perinatal mortality rate between developed and developing countries is the availability of good neonatal care services. If these services are improved in our environment, the salvage rate among twin deliveries in our health facilities should improve.

References

1. Azubike JC. Multiple births in Igbo women. *Br J Obstet Gynaecol*, 1982; 89: 77-79.
2. Knox G, Morley D. Twinning in Yoruba women. *J Obstet Gynaecol Br Emp*, 1960; 67: 981-984
3. Nylander PPS. Perinatal mortality in twins. *Acta Genet Med Gemellol*, 1979; 28: 363-363
4. Rehan N, Tafida DS. Multiple births in Hausa women. *Br J Obstet Gynaecol*, 1980; 87: 992-995.
5. Thigpen J. Discordant twins: a case report. *Neonatal Network*, 1996; 15: 35-39
6. Saacks BC, Thorp JM Jr, Hendricks CH. Cohort study of twinning in an academic health center; changes in management and outcome over 40 years. *Am J Obstet Gynaecol*, 1995; 173: 432-439.
7. Ellis RF, Berger GS, Keith L, Depp R. The North Western University multi-hospital twin study II: mortality of the first versus second twins. *Acta Genet Med Gemellol*, 1979; 28: 347-348.
8. Fakeye O. Twin birth weight discordance Nigeria. *Int J Gynaecol Obstet*, 1986; 24: 235-238
9. Babson SG, Kangas J, Young N, Bramhall JL. Growth and development of twins dissimilar in size at birth. *Paediatrics*, 1964; 33: 327-330
10. Sonntag J, Waltz S, Schollmeyer T, Schuppler U, Schroder H, Neisner D. Morbidity and mortality of discordant twins up to 34 weeks gestational age. *Eur J Paediatr*, 1996; 155: 224-229
11. Obisesan KA, Arowojolu AO, Ilesanmi AO, Roberts OA, Fawole O. Relative risk associated with the second-born twin at birth. *Nig J Clin Pract*, 1999; 2: 13-14
12. Graf H, Retzke U, Dabor A, Ketscher KD, Schmoll L, Schneeberger S. Weight discordance of the second twin: effect on perinatal morbidity and mortality: an 8 year analysis. *Zentralbl Gynakol*, 1997; 119: 106-110.
13. Rydhstrom H, Ingemarsson I. Interval between birth of the first and second twin and its impact on second twin perinatal mortality. *J Perinat Med*, 1990; 18: 449-453
14. Kouam L, Kamdom-Moyo J, Doh AS, Ngassa P, Saliyu HM. Outcome of twin deliveries at the University Teaching Hospital, Yaounde, Cameroon - a 15 year experience. *J Obstet Gynaecol*, 1998; 18: 340-344.