

## Relative Birth Weights in Twins

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### Abstract

**Background:** To determine if the first twin (Twin I) weighs more than the second twin (Twin II).

**Methods:** One hundred and seventeen sets of twins delivered at the Federal Medical Centre Makurdi, Nigeria over a three year period between 1<sup>st</sup> January, 2005 and 31<sup>st</sup> December 2007 were reviewed.

**Results:** Of the 117 sets of twins in the study, 9(7.7%) were of equal weights while in 57(48.7%) sets Twin I were heavier than Twin II. In 51(43.6%) sets Twin II were heavier than Twin I. The mean birth weight of Twin I was  $2.460 \pm 0.436$  Kg while that of Twin II was  $2.390 \pm 0.451$  Kg. ( $P < 0.05$ ).

**Conclusion:** Twin I was often heavier than twin II. The difference in the mean birth weight of twin I and Twin II was statistically significant in favour of Twin I.

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### Introduction

In obstetrics, it is generally accepted that multiple gestation is a complicated pregnancy with increased morbidity and mortality as compared to singleton pregnancy.<sup>1,2,3</sup> This is in spite of the general improvement in obstetric services and perinatal care with attendant improvements in outcome in many high risk obstetric conditions including multiple pregnancy.<sup>4</sup> The incidence of multiple pregnancy is known to be very high in Nigeria<sup>3-8</sup> with a reported incidence of between 14.4 and 40 per 1000 births.<sup>1,6,8</sup>

Several studies have shown increased risks for the second twin.<sup>3,8,9</sup> This may be explained by the greater frequency of malpositions of the second twin after delivery of the first twin and usually lighter weight of the second twin.<sup>8,9,10</sup> Unequal size of fetuses, a frequent occurrence of multifetal gestations is associated with increased perinatal mortality and morbidity.<sup>10-14</sup> Amaru et al have reported increased risk for some adverse neonatal outcomes when there is 20% or more growth discordance in twins.<sup>15</sup> Reported adverse neonatal

outcomes included low and very low birth weight, neonatal intensive care unit admission, neonatal oxygen requirement, hyperbilirubinemia and increased likelihood of having a cesarean delivery.<sup>15</sup>

This study is the first study to be carried out on twins in the study population. The aim of the study is to determine whether the first twin weighs more than the second twin in a defined Nigerian obstetric population.

### Patients and Methods

This was a retrospective study of all natural twin births at the Federal Medical centre Makurdi, Nigeria between January 2005 and December 2007. The antenatal, theatre and labour ward records were retrieved and the weights, sex, mode of delivery and perinatal outcome were extracted. For caesarean deliveries the first delivered twin was considered to be twin I while the second was designated twin II. The differences in birth weight (the weight difference between twin I and twin II) were examined to determine the magnitude and direction of weight differences. All weights were taken using a Way master 13 Kg x 50 grams weighing scale. Excluded from the study were a set of triplets and a set of twin pregnancy following in - vitro fertilization. Data on birth weight was easily retrieved because of the multiple sources like the case files, labour ward register and theatre records. Data analysis was with Epi info 3.3.2 (CDC Atlanta Georgia USA). Test of significance was by the student t or <sup>2</sup> test as applicable with a level of significance set at  $P < 0.05$ .

### Results

During the 36 months of the study there were 4,511 deliveries of which 117 were twin deliveries giving an incidence of 2.59% or 1 in 38 deliveries.

There were 128 male twins constituting 54.7% of twins while 106 (45.3%) were female twins. (Table I). Male male twin pair occurred in 39 (33.3%), female male twin pair in 29 (24.7%), female female in 25 (21.9%) and male female in 24 (20.2%). Of the 117 sets of twins in this study 9 (7.7%) were of equal weight. In 57 (48.7%) twin I were heavier than twin II while in 51

(43.6%) twin II were heavier than twin I (Table II). Of the 9 twins that were of the same weight, four were male male twin pairs, four were male female and one was a set of female female twins.

Twenty six of the 117 sets of twins had caesarean delivery giving a caesarean delivery rate of 22.2%.

The mean birth weight of twin I was  $2.463 \pm 0.436$  Kg while that of twin II was  $2.390 \pm 0.451$  Kg. Thus twin I had a weight advantage over twin II. (Table III). The yearly mean birth weight of twin I was larger than that of twin II with a cumulative weight difference of 0.220 Kg. (Table III). This showed a preponderance of large first twins. In contrast, the yearly mean birth weight of twin II over the three years of the review was consistently less than that of Twin I. (Table III)

Male Twin I weighed more than Female Twin I, Female Twin II and Male Twin II. However, Female Twin II were heavier than both Male Twin II and Female Twin I (Table IV).

**Table I: Yearly sex distribution of twins**

Year	Male	Female	Total
2005	36	30	66
2006	49	37	86
2007	43	39	82
	128	106	234

**Table II: Relative birth weights of Twins I and II**

	Number	Percentage
Twin I > Twin II	57	48.7
Twin I < Twin II	51	43.6
Twin I = Twin II	9	7.7
Total	117	100

**Table III: Mean birth weights of Twins I and II (p < 0.05)**

Year	Twin I (kg)	Twin II (kg)	Weight difference (Kg)
2005	2.41	2.37	0.04
2006	2.44	2.43	0.01
2007	2.54	2.37	0.17
	2.463	2.390	0.220

**Table IV: Mean birth weights of twins by sex in Kg.**

Year	Male Twin I	Female Twin I	Male Twin II	Female Twin II
2005	2.36	2.47	2.44	2.30
2006	2.52	2.37	2.51	2.35
2007	2.72	2.36	2.23	2.52
	2.53	2.39	2.39	2.40

## Discussion

The twinning rate of 1 in 38 deliveries (26.3 / 1000 deliveries) in this study is in keeping with the already documented high twinning rates in Nigeria. This rate was

closer to 28 / 1000 reported in Jos<sup>7</sup> but higher than 14.4/1000 in Maiduguri<sup>6</sup>, both in Northern Nigeria. It was however lower than the reported incidence of more than 40 / 1000 in South West Nigeria.<sup>4</sup>

Excluding twins of equal weights, this study revealed that 48.7 % of Twin I were heavier than Twin II infants, while Twin II were heavier in 43.6 % of cases. This agrees with previous studies in Nigeria.<sup>8,9</sup> The outcome of the study differs from the findings of Friedman et al which showed that Twin II were heavier in 55 % of their studied 206 set of twins though.<sup>17</sup> This may be explained by inherent differences in the sociodemographic characteristics of the studied population. Additionally, this review showed that the mean birth weight of Twin I was greater than that of Twin II. This was also similar to earlier studies.<sup>8,9,18</sup> Kuti et al<sup>4</sup> however reported the mean birth weight of Twin II to be  $2.44 \pm 0.64$  Kg against  $2.34 \pm 0.62$  Kg for Twin I. The cumulative difference in mean birth weight between Twin I and Twin II over the three years of the review was 0.220 Kg in favour of Twin I. Similar findings were reported in previous studies<sup>8,9</sup> and suggests a preponderance of large first twins. The greater weight difference was contributed by the births in the year 2007 as revealed by table III. This study could not explain this finding.

Interestingly, the mean birth weight of Male Twin I was more than that of male twin II, but the reverse was the case with female twin II weighing more than Female Twin I. The small size of this study may explain this as a larger study may show a more definite pattern.

The cumulative mean birth weight difference of Twin I compared to Twin II of 0.220 Kg was statistically significant ( $P < 0.05$ ). This appears clinically significant as both twins tend to weigh less than their singleton counterparts. Considering the increased risks for the second twin,<sup>3,8,9,10</sup> the relative smaller weight of the second twin deserves vigilance at birth.<sup>8</sup>

Male babies are generally accepted to be heavier than females at birth in singletons<sup>8</sup> but in this study with a male to female ratio of 128 to 106 (Table I), the difference was not statistically significant enough to confirm this. (Table IV). Thus twin birth weight was independent of sex in this study. ( $P > 0.05$ ). These findings are similar to some previous studies.<sup>8,9</sup>

The study is not however without its limitations. In the first instance, weights were taken by different persons and not with a digital device introducing the possibility of inter and intra observer errors. The inclusion of twins delivered by caesarean section may have introduced

an allocation bias as the first twin to be delivered may not necessarily have been the leading twin. Again other determinants of birth weight such as gestational age, parity and social class of patients were by design not included in this review primarily because of its retrospective nature. To this end a well planned prospective study in future is recommended.

In conclusion, Twin I was often heavier than Twin II. The difference in mean birth weight of Twin I and Twin II was statistically significant in favour of Twin I.

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