



Perinatal Mortality in Twins

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A study of perinatal mortality in twins has been carried out concurrently in Ibadan, Nigeria, and Aberdeen, Scotland. In both areas perinatal mortality rates have been found to be four times higher in twins than in singletons, reaching up to 310 per 1000 in the monochorionic group in Ibadan. Moreover, rates have been found to increase considerably with maternal age and parity.

Key words: Twin pregnancy, Perinatal mortality, Monochorionic twins, Maternal age, Parity

INTRODUCTION

It is common knowledge that twin births are more hazardous than singleton births. Perinatal mortality in twins would therefore be expected to be much higher than in singletons. The data in a twinning research project carried out recently in Ibadan (Western Nigeria) have been analyzed to 1) compare perinatal mortality in twins and in singletons; 2) study perinatal mortality in the different types of twins; 3) investigate some of the factors that influence perinatal mortality in twin maternities; 4) find out how the high twinning rate in Ibadan (approximately 50 per 1000 maternities, ie, about 4 times that in Europe) influences perinatal mortality.

Data in a twinning study carried out concurrently in Aberdeen (Scotland) have also been analyzed to compare the findings, where feasible, in the Western Nigerian community with those in Aberdeen.

The term "perinatal mortality rate" is used in this study to mean the number of stillbirths and deaths during the first week of life per 1000 live and stillbirths.

MATERIALS AND METHODS

The Ibadan Study

In the Ibadan study, obstetric and other data (including maternal age, parity, and sex of the babies) were collected from all patients who delivered in the three major hospitals in Ibadan over a period of one year (1967-1968). The placentae of all the newborn twins were studied (macroscopically and by

histological examination), during this period, to determine the type of placentation. From each twin pair, samples of placental tissues were studied with respect to placental enzymes, and cord blood samples were studied for blood grouping and red cell enzymes. The zygosity of each twin pair was thus determined by sex, placentation, blood groups, red cell, and placental enzyme [5].

The Aberdeen Study

The Aberdeen study was carried out in 1965 and 1966. The centralization of obstetric records in Aberdeen made it possible to identify all the 608 twin maternities that occurred in the city between October 1950 and December 1965. Obstetric data were extracted from the case records of each patient and recorded on Cope-Chat cards. The data included maternal age, parity, sex, weight, complications of the babies, and placentation of the twins, as recorded by the midwives and doctors at birth.

Of the 608 twin maternities, 198 twin pairs were unlike-sexed and therefore dizygotic. The sex was not known in six twin pairs, which included a fetus papyraceous and a hydatidiform mole. Zygosity determination was carried out in 233 of the remaining 404 like-sexed twins, incomplete data being due to death of one or both twins or migration of the mother (see Table 7). Zygosity was known for nine sets of twins who had left the city, as blood grouping had been carried out at birth. Zygosity of the 233 like-sexed twins was determined by blood grouping (using nine systems), similarity in general appearance, and finger printing [6].

RESULTS

The Ibadan Study

There were 778 perinatal deaths out of 12,809 babies delivered in the three hospitals during the period of survey. The perinatal mortality rate during this period was therefore 60.7 per 1000 (Table 1). These figures include both booked and unbooked patients. The influence of some obstetric factors on perinatal mortality has been studied.

Maternal Age. Table 2a shows the relation between maternal age and perinatal mortality rate. The rate is 61 per 1000 in mothers between the ages of 15 and 19, falls to 47 per 1000 in the 20–24-year age group, and rises steeply to 89 per 1000 at the age of 40 and over.

Parity. A similar trend is seen in Table 2b in which perinatal mortality has been analyzed by

TABLE 1. Perinatal Mortality in Three Major Hospitals in Ibadan (1967–1968)

Total number of babies	12,809
Number of perinatal deaths	778
Perinatal mortality rate	60.7 per 1000

TABLE 2a. Perinatal Mortality in Three Major Ibadan Hospitals, by Maternal Age

Age (years)	15–19	20–24	25–29	30–34	35–39	40+
Perinatal mortality rate (per 1000)	61	47	62	70	86	89
Number of babies	1670	3903	3852	2442	773	169

TABLE 2b. Perinatal Mortality in Three Major Ibadan Hospitals, by Parity

Parity	0	1	2	3	4	5+
Perinatal mortality rate (per 1000)	60	52	61	64	64	72
Number of babies	3133	2749	2687	1945	1157	1137

parity. Starting with a rate of 60 per 1000 in primigravidae, there is a fall to 52 per 1000 in primiparae, and a subsequent gradual rise to 72 per 1000 in women who are para 5 and over.

Twinning. In Table 3 the influence of multiple pregnancy on perinatal mortality is shown. The perinatal mortality rate in twins (173.9 per 1000) is about four times that in singletons (46.3 per 1000). Figures 1 and 2 further illustrate the influence of twinning on perinatal mortality. The rates in every maternal age group and parity are much higher in "all births" (which includes twin births) than in "singleton births." Perinatal mortality rates in different zygosity types are shown in Table 4. The rate of 151 per 1000 in dizygotic (DZ) twins is lower than that in monozygotic (MZ) twins. The highest rate, however, is found in the group of twins with monochorionic placentae.

Gestation Period. Perinatal mortality rates are shown in Table 5 for singleton and twin babies born at different periods of gestation. The rate for singletons born between the 28th and 33rd week of pregnancy is very high indeed, being 476 per 1000. This rate falls as the period of gestation increases, until, at 40 weeks and over, it is only 28 per 1000. The corresponding rate for twins is much higher at each period of gestation. Whereas 15.7% of singletons were delivered between 28 and 36 weeks gestation (at which period the perinatal mortality rate is relatively high), as many as 40% of twins were delivered at this precarious period of gestation (Table 6).

The Aberdeen Study

The data in the Aberdeen study have been analyzed to find the perinatal mortality rates in singleton and twin legitimate maternities between 1951 and 1965. Since the study

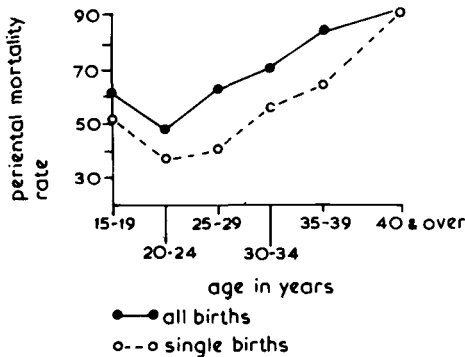


Fig. 1. Perinatal mortality rates by maternal age.

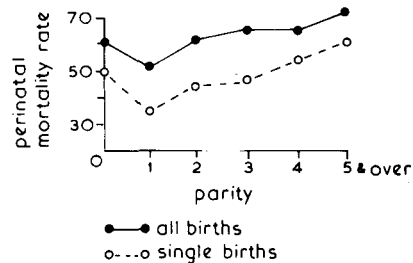


Fig. 2. Perinatal mortality rates by parity.

TABLE 3. Influence of Multiple Pregnancy on Perinatal Mortality in Ibadan

	Perinatal deaths	Total number of babies	Perinatal mortality rate (per 1000)
Singletons	526 (68%)	11,360	46.3
Twins ^a	252 (32%)	1449	173.9
Total	778 (100%)	12,809	60.7

^aTwinning rate in the three Ibadan Hospitals is 52 per 1000 maternities.

was retrospective and investigation for zygosity was done only in those children who survived (Table 7), it has not been possible to find the perinatal mortality rate in MZ twins.

Table 8 shows the perinatal mortality rates in singleton and twin legitimate maternities in Aberdeen from 1951 to 1965. Of 45,378 singletons born during this period, there were 1215 perinatal deaths, a perinatal mortality rate of 26.8. The corresponding perinatal mortality in the twin babies was 95.7 (six cases of fetus papyraceous and hydatidiform moles have been excluded).

TABLE 4. Perinatal Mortality by Type of Twinning

	Monozygotic twins		Dizygotic twins
	Monochorionic	Others	
Perinatal mortality rate (per 1000)	310	186	151
Number of babies	74	70	1161

TABLE 5. Perinatal Mortality Rates (per 1000) by Period of Gestation in Two Ibadan Hospitals

	Gestation period (weeks)				Total
	28-33	34-36	37-39	40+	
Singletons	476	92	26	28	50
Twins	648	173	66	42	174

TABLE 6. Singleton and Twin Births by Gestation Period

	Gestation period (weeks)		Total
	28-36	37+	
Singletons	735 (15.7%)	943 (84.3%)	4678 (100%)
Twins	588 (40.4%)	866 (59.6%)	1454 (100%)

TABLE 7. Sex Distribution and Zygosity of Twins Delivered in Aberdeen 1950-1965

Sex and zygosity determination	MF	MM	FF	Not recorded	Total
Unlike	198	198
Like					
Zygosity determined		125	108	...	233
Zygosity known from blood grouping at birth	...	7	2	...	9
Zygosity undetermined (one or both twins died)	...	40	24	...	64
Mother migrant (no information)	...	43	55	...	98
Not recorded ^a	6	6
Total	198	215	189	6	608

^aTwins in this group included cases of fetus and papyraceous and hydatidiform mole.

TABLE 8. Perinatal Mortality in Singleton and Twin Legitimate Maternities in Aberdeen (1951–1965)

	Singleton maternities	Twin maternities			All twins
		MZ	DZ	Zygosity unknown	
Number of perinatal deaths	1,215	...	39	69	108
Total number of babies	45,378	188	684	256	1,128
Perinatal mortality rate	26.8				95.7

DISCUSSION

The Ibadan study shows that, in this population, the perinatal mortality rate in twins is approximately four times that in singletons. Similar findings have been made in the Aberdeen study, which also shows that the perinatal mortality rate in twins is about four times that in singletons. These findings are in agreement with those of other investigators, like Bender [3] and Anderson [1].

The Ibadan study has also shown that MZ twins have a higher perinatal mortality rate than DZ twins and that monochorionic twins have the highest perinatal mortality rate – viz, 310 per 1000 babies; ie, approximately one in every three babies dies at birth or in the first week in this group. This finding of a higher perinatal mortality in the MZ group, and in monochorionic twins in particular, is in agreement with that of other investigators, like Potter [8] and Fujikura and Froehlich [4] who have studied placentation, zygosity, and perinatal deaths in twins.

The Ibadan study has also shown the association between maternal age and parity and the perinatal mortality rate. The relatively low rates observed in this study in the primipara and the 20–24-year age group, and the subsequent rise with maternal age and parity, are in agreement with results obtained in some investigations in Caucasian populations [2]. Since multiparae have relatively high perinatal mortality rates, the tendency to large families in the Western Nigerian community would contribute to the high perinatal rate.

Thus, it is seen that twinning makes a substantial contribution to the perinatal mortality rate in Western Nigeria. The rate is very high in premature babies, and a large proportion of twins are born prematurely. Furthermore, approximately 10% of the babies born in this population are twins (the twinning rate being approximately 50 per 1000 maternities), compared with the corresponding figure of about 2% in the UK and the United States. Therefore, any efforts directed at reducing perinatal mortality in twin babies in Western Nigeria will assist greatly in reducing the overall perinatal mortality.

Probably the most important single factor responsible for the high perinatal mortality in twins is premature labour. In many hospitals in developed countries it is routine practice to admit patients with twin pregnancy into hospital for rest for a few weeks in an effort to prevent this serious complication. Although this routine is widely practiced, it is doubtful if rest in hospital per se reduces the risk of premature labour and perinatal death, since the women with poor physique in the low socioeconomic group, who are more at risk, are least likely to stay in hospital whereas many of those who agree to stay in hospital belong to

the higher socioeconomic group and would have done quite well at home. However, in Ibadan and other developing communities, where lack of transport facilities may cause considerable delay in getting to hospital, a more important reason for encouraging rest in hospital in twin pregnancy is that, if premature labour does occur, the baby has a better chance of survival if delivered in hospital (where resuscitative measures are readily available) than if delivery occurred at home or on the way to the hospital. Unfortunately, the scarcity of hospital beds and the high twinning rate makes it impossible for all patients expecting twins to be admitted to hospital for rest in Ibadan. It therefore becomes necessary to identify the "high-risk" patients who should be given priority. From the present study, two groups of such patients can be identified: 1) The young primigravidae. These patients have a much greater chance of having MZ than DZ twins [7]. and it has been shown that the perinatal mortality rate is much higher in MZ twins. 2) The older multi-parous women. These patients are also at risk, since perinatal mortality rates rise with maternal age and parity, as shown in Figures 1 and 2.

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