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Perinatal Mortality in Twin Infants

By: Triwibowo Soedjas, Achmad Suryono, Purnomo Suryantoro, Sugiyanto, M. P. Damanik and Ismangoen

Department of Child Health, Gadjah Mada University
Faculty of Medicine, Yogyakarta

ABSTRAK

Triwibowo Soedjas, Achmad Suryono, Purnomo Suryantoro, Sugiyanto, M. P. Damanik, & Ismangoen — *Kematian perinatal pada bayi kembar*

Ditinjau kembali berat badan lahir, nilai Apgar, cara persalinan dan kematian perinatal pada 186 bayi kembar yang lahir di Rumah Sakit Universitas Gadjah Mada, Yogyakarta, tahun 1977 sampai dengan tahun 1981.

Mereka terdiri atas 80 bayi pertama dan 106 bayi kedua. Tigapuluh sembilan (21%) bayi lahir kurang bulan, 112 (60,2%) dengan berat badan lahir rendah dan 78 (42%) termasuk sebagai bayi kecil untuk masa kehamilan.

Bayi kedua mempunyai nilai Apgar yang lebih rendah dibanding dengan bayi pertama. Demikian pula presentasi kematian perinatal dan cara persalinan abnormal pada bayi kedua lebih banyak dibanding dengan bayi pertama.

Key Words: twin infants — Apgar score — neonatal mortality — abnormal labour — Lubchenco curve

INTRODUCTION

It is well known that the presence of multiple fetuses greatly increased both maternal mortality and perinatal morbidity and mortality. The hazards of multiple pregnancy are related to both the suboptimal intrauterine conditions and to the increased hazards during intrapartum period; meanwhile, fetal anomalies are more common in multiple pregnancies than in singletons (Powers, 1973; Evans & Glass, 1976; Medearis *et al.*, 1978). Abnormal presentation, circulatory interference by one fetus with the other and operative delivery are in favour to fetal loss in twins.

Previous reports on twin pragnancies revealed that fetal and neonatal loss is greater in twin than in singleton pregnancies, and that of in the second is greater than in the first twin infants (George, 1970; Ware, 1971; Evans & Glass, 1976; Tanjung *et al.*, 1976).

The purpose of this study is to review the occurence of twin infants born at the Gadjah Mada University Hospital with particular reference to perinatal mortality.

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MATERIAL AND METHODS

There were 186 twin infants out of 3720 infants born at the Gadjah Mada University Hospital, Yogyakarta, from January 1977 to December 1981. They were divided into three groups, *i. e.*:

- group I consisting of 80 first infants,
- group II consisting of 80 second infants (they were the twin fellow of the first group),
- groups III consisting of 26 second twins whose pairs were delivered outside the hospital either by trained personnel or traditional midwife, and after on delivery difficulties they were referred to the hospital.

These infants were analyzed for body-weight at birth, sex, Apgar score, methods of delivery and perinatal mortality.

Weights are increments of 500 grams from 1000 to 2499 grams; the intrauterine growth condition is measured by plotting on Lubchenco intra-uterine growth curve. Interval of 1 and 5 minute Apgar scores are used in this study; score 0 through 3 is considered poor, 4 through 6 fair, and 7 through 10 good.

RESULTS

Birth-weight and gestational age

From the present series of 186 infants, 112 (60.2%) were low-birth weight infants, consisting of 47 (58.8%) first twins and 65 (75.6%) second twins. From group I and II, according to gestational age, 17 (21.3%) pairs were delivered preterm, 59 (73.8%) were at term and 4 (5%) were post-term. Among group III, 5 (19.2%) were delivered preterm, 20 (77%) were at term and 1 (3.8%) were post-term. Among the total twins 78 (42%) were considered as small for gestational age or had intrauterine growth retarded as they were below the tenth percentile on Lubchenco curve.

TABLE 1. – Sex ratio of twins

Sex	No. of Pair	Males	Females
Group I & II: Like sex	55	60	50
Unlike sex	25	25	25
Group III		15	11
Total		100	86

Male-female ratio = 1.163:1

Apgar score

Morbidity as measured by both 1 and 5 minute Apgar scores was analyzed in TABLES 2, 3 and 4. Twenty six (34.2%) of group I infants showed poor and fair one minute Apgar scores, while among group II and group III there were 48 (60.8%) and 11 (68.8%) respectively. Group I showed a significantly low amount of poor conditions.

TABLE 2. — Percentage distribution of group I into various Apgar score groups

Birth-Weight (in grams)	1 min. Apgar Scores			5 min. Apgar Scores		
	0 – 3	4 – 6	7 – 10	0 – 3	4 – 6	7 – 10
< 1 000	1	—	—	1	—	—
1 000 – 1 499	1	3	3	—	3	4
1 500 – 1 999	1	2	11	—	3	11
2 000 – 2 499	1	5	17	1	2	20
⩾ 2 500	3	9	19	1	5	25
Total	7	19	50	3	13	60
(%)	(9.2)	(25)	(65.8)	(3.9)	(17.1)	(78.9)

TABLE 3. — Percentage distribution of group II into various Apgar score groups

Birth-Weight (in grams)	1 min. Apgar Scores			5 min. Apgar Scores		
	0 – 3	4 – 6	7 – 10	0 – 3	4 – 6	7 – 10
< 1 000	2	1	—	1	2	—
1 000 – 1 499	2	3	—	1	2	2
1 500 – 1 999	4	8	6	1	4	13
2 000 – 2 499	3	11	10	—	6	18
⩾ 2 500	4	10	15	4	5	23
Total	15	33	31	4	19	56
(%)	(19)	(41.8)	(39.2)	(4)	(24)	(71)

TABLE 4. — Percentage distribution of group III into various Apgar score groups

Birth-Weight (in grams)	1 min. Apgar Scores			5 min. Apgar Scores		
	0 – 3	4 – 6	7 – 10	0 – 3	4 – 6	7 – 10
< 1 000	—	—	—	—	—	—
1 000 – 1 499	—	—	—	—	—	—
1 500 – 1 999	—	—	1	—	—	1
2 000 – 2 499	3	3	1	1	3	3
⩾ 2 500	—	5	3	—	—	8
Total	3	8	5	1	3	12
(%)	(18.8)	(50)	(31.2)	(6.3)	(18.8)	(75)

Deaths

Among 186 twin infants there were 15 fetal and 24 neonatal deaths. TABLE 5 shows that neonatal mortality of group II and III were higher than that of group I (*i. e.* 10.5% in group I, 17.7% in group II, and 12.5% in group III), although the difference is not significant. In comparing the mortality of group I (first twins) and group II (second twins), there were more deaths in group II, but the difference is not great (*i. e.* 15% *vs* 18.8%). The mortality of group III (46.2%) was markedly higher ($p<0.05$) as compared to group I (15%), while no significant difference was found between total mortality of twins (20%) and singleton (19.5%).

TABLE 5. — Comparison of fetal and neonatal deaths between twins singleton for the same period

	No. of Infants Born	Deaths (%)		
		Fetal	Neonatal	Total
Singleton	3 534	481 (13.6)	209 (6.8)	690 (19.5)
Total twins	186	15 (8)	24 (14)	39 (21)
Group I	80	4 (5)	8 (10.5)	12 (15)
Group II	80	1 (1.2)	14 (17.7)	15 (18.8)
Group III	26	10 (38.5)	2 (12.5)	12 (46.2)

TABLE 6. — The neonatal mortality of twin infants with reference to birth-weight

Birth-Weight (in grams)	Live Birth	Still-birth	Died in the First 24 Hours	Early Neonatal Mortality	Late Neonatal Mortality
< 1 000	4	—	1	3	1
1 000 — 1 499	13	2	2	6	—
1 500 — 1 999	33	—	—	3	2
2 000 — 2499	54	7	1	4	1
⩾ 2 500	67	6	2	2	2
Total	171	15	6	18	6
(%)	(92)	(8)	(3.5)	(10.5)	(3.5)

Of the 171 live-born twin infants, 18 (10.5%) died in early neonatal period, among them 33% died in the first 24 hours and 6 (3.5%) in late neonatal period (TABLE 6).

TABLE 7. — Twin mortality of first and second twins according to weight groups

Birth-Weight (in grams)	Group I LB = 76		Group II LB = 79		Group III LB = 16	
	SB	NM	SB	NM	SB	NM
< 1 000	—	1	—	3	—	—
1 000 — 1 499	1	2	—	4	1	—
1 500 — 1 999	—	2	—	3	—	2
2 000 — 2 499	1	1	—	2	6	—
	2	6	—	12	7	2
⩾ 2 500	2	2	1	2	3	—
Total	4	8	1	14	10	2
	(5)	(10.5)	(1.3)	(17.7)	(38.5)	(12.5)

SB = Stillbirth
LB = Live-birth
NM = Neonatal mortality

The neonatal mortality of low birth-weight twin infants was 20(19.4%), whereas the neonatal mortality of twin infants with a birth-weight of more than 2500 grams was 4(5.9%); there was a significant difference between the two figures ($p<0.05$).

Method of delivery

When comparing the first (group I) and second twins (group II and III) according to the method of delivery, 42.1% of the first twins were delivered abnormally as compared to 56.8% in the second twins. The majority of abnormal presentation was breech presentation, *i. e.* 26.3% of the first and 49% of the second twins.

According to their methods of delivery the neonatal mortality of twin infants was shown in TABLE 8. Deaths of spontaneous vertex delivery were 6 among 85 infants, while deaths of non-spontaneous were 18 among 86 infants; there was a significant difference ($p<0.05$).

TABLE 8. — The neonatal mortality of the twin infants according to their method of delivery

Method of Delivery	Group I		Group II		Group III	
	Live Birth	Neonatal Mortality	Live Birth	Neonatal Mortality	Live Birth	Neonatal Mortality
Vacuum extraction	7	—	10	1	2	—
Forceps	2	—	—	—	—	—
Breech presentation	20 (26.3%)	—	30 (38.6%)	6	8 (50%)	2
Version and extraction	—	—	1	1	—	—
Cesarean section	3	2	3	2	—	—
	32 (42.1%)	6	44 (55.7%)	10	10 (62.5%)	2
Spontaneous vertex delivery	44 (57.9%)	2	35 (44.3%)	4	4 (37.5%)	—
Total	76	8	79	14	16	2

DISCUSSION

The incidence of twinning in this series was 1:20 deliveries, higher than that reported previously by Tanjung *et al.* (1976) in Medan.

Among 186 infants, 112 (60.2%) were considered as low birth-weight, while according to gestational age 39 (22.6%) were preterm.

Intrauterine growth retardation in twins in late gestation has long been recognized (Evans & Glass, 1976; Clokerty & Stark, 1980). Of these infants in this study 42% were below the tenth percentile when plotted on Lubchenco's intrauterine growth curve. According to Sofoewan *et al.* (1979) intrauterine growth retardation was found in 69.8% out of 54 infants.

There was a markedly higher incidence of poor and fair 1 minute Apgar scores in the second twins, while the difference of 5 minute Apgar scores of first and second twins does not show any significance.

The fetal and neonatal death of twins in the present series amounted to 21%, whereas the singleton was 19.5% for the same period. The fetal deaths of twins were lower than the singleton (*i. e.* 8% *vs.* 13.6%) and neonatal deaths were higher for twins than for singleton (*i. e.* 14% *vs.* 6.8%). Since this hospital

is a referral hospital, pregnant mothers usually come in poor or pathologic condition. It is assumed that high incidence of singleton mortality is due to this condition and makes the findings differ from other investigations (Evans & Glass, 1976; Benson, 1980).

Among 186 twin infants there were 15 fetal and 23 neonatal deaths, and showed that 60% of the neonatal mortality occured in the first 7 days of life. The mortality of the second twins was higher than that of the first twins. The higher mortality of the second twins has also been found by other authors (Ho & Wu, 1975; Taylor, 1978). It may be due to the higher incidence of malpresentation (anything but vertex) in the second twins where it should make stress and is hazardous for the infants. In this series the live birth delivery below 2500 gram is 103 (60.2%) and among these 20 (19.4%) died during the neonatal period. When compared to the neonatal death of infants delivered more than 2500 grams, *i. e.* 4 (5.9%) out of 68 (39.8%), significant difference was encountered. The higher percentage of low birth-weight in the second twins (*i. e.* 58.8% *vs.* 75.6%) might explain the lower Apgar scores of the second twins. However, the mortality is also influenced by other factors such as delay in delivery of the second twin with an increased possibility of hypoxia and hemorrhage, a greater risk of hyalin membrane disease, smaller size of second twins (Ware, 1971; Verduzco *et al.*, 1976; Clokerty & Stark, 1980). According to Benson (1980) the first twins have about a 3% greater chance of survival than the second twins.

The relationship of the retention of the second twins and foetal death has been noted by Qomar *et al.* (1979). It was reported that there were no foetal deaths on retention less than one hour, 33.33% if retained for 1—2 hours, 42.9% if retained for 2—3 hours and 52.2% if retained for more than 3 hours.

In this study the abnormal deliveries were 42.1% of the first twins, while in the second twins there were 55.7% (group II) and 62.5% (group III). Since abnormal deliveries can be more hazardous for these infants, this factor could be part of the reason for the low Apgar score and for the increased perinatal mortality of the second twins. In this series according to the method of delivery, the higher incidence of abnormal deliveries showed a higher mortality.

Of course, a follow-up study of twins will be valuable, including other factors such as type of twins, complications, insertion of the umbilical cord, mortality and morbidity figures and cause of death. It is hoped that this review will stimulate further study.

SUMMARY

A review of factors related to 186 twin infants during the year of 1977 through 1981 was presented. Of these 39 (21%) were preterm, 112 (60.2%) belonged to low birth-weight infants and 78 (42%) were considered as small for gestational age. The male and female ratio was 1.163:1.

At 1 minute evaluation, first twins had a significantly lower incidence of poor and fair Apgar scores when compared to those of the second twins, but at 5 minute no difference was found.

It was noted that higher percentage of mortality in the second twins as compared with the first twins might be due to higher percentage of low birth-weight

infants in this group. It turned out also that a higher incidence of abnormal deliveries were found in the second group. Although no significant difference was found between the mortality of twins and single pregnancies, more attention must be paid to reduce neonatal morbidity and its long term sequelae.

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