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Perinatal Mortality in Multiple Pregnancy Patients

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Abstract. A study of perinatal mortality in multiple pregnancy over a period of 12 years, 1972 to 1984, showed prematurity and low birthweight as the major causes of fetal loss. The highest risk was found at 28 to 30 weeks gestation (306/1,000). There was a significantly greater risk to babies delivered by the breech (136/1,000), and likewise in the second twin when compared with the first, ratio 1:1.4. A significant drop in the perinatal mortality rate, from 98/1,000 to 39/1,000, was observed between 1972-1978 and 1979-1984. Ultrasound has facilitated the earlier diagnosis of twins and provides more accurate serial fetal assessment. Bedrest, more vigilant antenatal care, intrapartum surveillance and improved neonatal care, are required to maintain and further reduce the perinatal mortality rate. When regional analgesia was employed in labour, the number of babies lost was 41/1,000, vs 93/1,000 in patients not receiving regional analgesia. External cephalic version and vertex delivery of the second twin is preferable to internal version and breech extraction. It should also be contemplated, as an alternative to elective cesarean section for a transverse lie or brrech presentation of the second fetus.

Key words: Perinatal mortality, Multiple pregnancy, Prematurity, Birthweight, Breech, Regional analgesia, Ultrasound

INTRODUCTION

The perinatal mortality associated with multiple pregnancies is higher than that found in singleton pregnancies. Figures approaching 100/1,000 are not unusual [17], and ranges of 36 to 300/1,000 have been reported [4]. The main indicting factors include an increased incidence of pregnancy complications, intrauterine growth

retardation, premature labour, gross structural defects and delivery complications. Several studies have identified factors which may reduce the high fetal wastage associated with multiple pregnancy. Most focus on the value of early diagnosis of twin pregnancy, bed rest and intensive antenatal and intrapartum care [7,8,14,15,18]. This study looks at the outcome of 458 multiple pregnancy patients who delivered 921 babies during the 12-year period, 1st April 1972 to 31st March 1984. Statistically significant observations were made on the methods of delivery, the use of regional analgesia and the descreasing incidence of perinatal deaths in the latter half of the study (1979-1984).

PATIENTS AND METHODS

Case notes from 458 consecutive women with a multiple pregnancy who were delivered at the Department of Obstetrics and Gynaecology, University College, Galway, during the 12-year period, 1st April 1972 to 31st March 1984, were analysed. Only patients with a gestational age > 28 weeks were studied. Perinatal mortality rate (PMR) in this study refers to the number of stillbirths and first-week neonatal deaths per 1,000 live and stillbirths. The corrected PMR excludes 4 babies who died of gross congenital structural defects. Statistical analysis using the Student t-test and chi square analysis was applied.

RESULTS

1. Incidence of Multiple Pregnancy and Perinatal Mortality Rate

A total of 32,654 patients were delivered in the unit during the period of study and 458 had a multiple pregnancy, giving an incidence of 1:71 for the latter. There were 5 sets of triplets in this series, showing an incidence of 1:6,531 for triplet pregnancy. There were 72 perinatal deaths in 921 multiple pregnancy babies, giving a PMR of 78/1,000 and a corrected PMR of 74/1,000, as defined above. No triplet baby died, hence PMR refers in effect to twin babies. The 72 perinatal deaths were made up from 34 (47.2%) stillbirths and 38 (52.8%) neonatal deaths.

2. Gestational Age and Birthweight

A summary of the distribution of birthweight and gestational age of the 72 perinatal deaths is shown (Table 1). There were 55 (76.4%) babies who weighed $< 2,000$ g at birth and 52 (72.2%) who were born prematurely < 37 weeks gestation. Four babies (5.6%) were born 1 week posterm.

Table 1 - Distribution of perinatal deaths according to birthweight and gestational age

Gestational age	No.	%	Birthweight (kg)	No.	%
28-30	22	30.6	< 0.50	1	1.4
31-33	14	19.4	0.50-0.99	18	25.0
34-36	16	22.2	1.00-1.49	14	19.4
37-39	16	22.2	1.50-1.99	22	30.6
40-42	4	5.6	2.00-2.49	9	12.6
			2.50-3.99	8	11.1
Total	72	100.0	Total	72	100.0

3. Perinatal Mortality and Type of Delivery

There were significantly more perinatal deaths among babies delivered by the breech, when compared with other forms of delivery. The level of statistical significance when perinatal death rates in breech deliveries were compared with alternative vaginal delivery methods is shown (Table 2).

Table 2 - Perinatal mortality in babies delivered by the breech, and other forms of vaginal delivery

Type of delivery	No. of babies	Perinatal deaths		Statistical diff. with breech
Breech	280	38	(13.6%)	
SVD[a]	335	16	(4.8%)	$P < 0.001$
Forceps	189	10	(5.3%)	$P < 0.01$
Vacuum	21	0	(0.0%)	
SVD + forceps + vacuum	545	26	(4.8%)	$P \ll 0.001$

[a]SVD = simple vaginal delivery.

4. Regional Analgesia and Perinatal Mortality in Multiple Pregnancy

There were 11 (4.1%) perinatal deaths in 268 babies delivered under caudal or lumbar epidural analgesia. This contrasts with 61 (9.3%) perinatal deaths among 653 babies delivered without regional analgesia. The difference is statistically significant ($\chi^2 = 6.5$, $P < 0.02$). A summary of the distribution of perinatal mortality according to type of delivery in 921 babies delivered with and without regional analgesia is shown (Table 3). A significant difference in outcome remains across the table for all types of delivery.

Table 3 - Perinatal mortality according to type of delivery, with and without regional analgesia[a]

Type of analgesia	SVD		Forceps		Elective CS		Emergency CS		Breech		Vacuum		Total	
	No.	PNM	No.	PNM	No.	PNM	No.	PNM	No.	PNM	No.	PNM	No.	PNM
No regional analgesia	280	13 (5%)	95	8 (8%)	51	5 (10%)	33	3 (9%)	183	32 (17%)	11	0 (0%)	653	61 (9%)
Regional analgesia	55	3 (5%)	94	2 (2%)	0	0 (0%)	12	0 (0%)	97	6 (6%)	10	0 (0%)	268	11 (4%)

[a]SVD = simple vaginal delivery. PNM = perinatal mortality.

5. Perinatal Mortality, 1972-1978 vs 1979-1984

A sudden and sustained drop in perinatal mortality from the year 1979 is evident (Table 4). The mean perinatal mortality during the preceding years (1972-1978) was 98.3/1,000 and the mean perinatal mortality during the subsequent years (1979-1984) had dropped to 38.5/1,000. This difference reaches statistical significance ($P < 0.01$) (Table 4).

Table 4 - Perinatal mortality. 12-year review

1972-1978				1979-1984			
Year	No. babies	Perin. deaths	%	Year	No. babies	Perin. deaths	%
1972	64	1	1.6	1979	78	4	5.1
1973	84	10	11.9	1980	66	2	3.0
1974	89	11	12.4	1981	82	6	7.3
1975	84	10	11.9	1982	60	2	3.3
1976	55	6	10.9	1983	70	3	4.3
1977	85	7	8.2	1984	20	0	0.0
1978	84	10	11.9				
Total	545	55	10.1	Total	376	17	4.5
Mean	77.9	7.9	9.8	Mean	62.7	2.8	3.9

Difference between mean perinatal mortality rates in the two periods: $t = 3.24$, $P < 0.01$ at 11 df.

6. The Effect of Birth Order in Twin Deliveries

Thirty one (43.0%) of the 72 perinatal deaths were first twins, and 41 (57.0%) were second twins (Table 5). Both babies were lost in 21 mothers and there were 20 second-twin-only deaths, as opposed to 10 first-twin-only deaths. Twenty six (63.4%) second twins were delivered by the breech, as compared with 12 (38.7%) first twins delivered in this way.

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Table 5 - Perinatal mortality in first and second twins, 1972-1978 vs 1979-1984

Years	Total PNM	First twin	Second twin	Ratio 1st:2nd twin
1972-1978	55	23	32	1:1.4
1979-1984	17	8	9	1:1.1
Total	72	31	41	1:1.3

DISCUSSION

Premature labour resulting in low birthweight infants is the major cause of fetal demise and neonatal problems in multiple pregnancy patients. Some 20%-40% of twins may be born before 37 weeks gestation [7] and figures as high as 45% can be found [6]. Similarly, up to 55% of multiple pregnancy babies may be expected to weigh less than 2,500 g [19]. It is therefore not surprising to find over 76% of our perinatal deaths weighed less than 2,000 g and over 72% were born prematurely (< 37 weeks).

The debate continues regarding the value of bedrest and tocolytics in the prevention of premature birth in multiple gestation. We believe there will remain a number of premature births in multiple pregnancy patients, irrespective of the preventive measures, or combinations of same that are used. The commonly employed management policies are the protocol of Persson [18] which includes bedrest, and the modified version by Papiernik [17] which includes reduced stressful activity and patient education. Efforts should be made to determine the optimum method of delivery for a given gestational age group. When coupled with expert intensive neonatal care, this should result in the perinatal mortality being reduced to even lower levels.

Although several studies mention the unfavourable outcome following breech delivery of twins [1,10,13], some report no such relationship [6]. This study shows a strong correlation between breech delivery in twin pregnancies and perinatal mortality. We found a strong and statistically significant difference in the outcome for breech babies when compared with those subjected to other forms of vaginal delivery. The difference assumes an even greater clinical significance when one considers that of the total 38 neonatal deaths in this study, 21 (55.3%) were delivered by the breech. Berger et al [1] considered that breech delivery was particularly disadvantageous for the low birthweight infant. With 33 (86.8%) of our 38 neonatal deaths weighing less than 2,000 g, and 19 (90.5%) of 21 breech neonatal deaths also weighing less than 2,000 g, our findings further emphasise this point. In addition, this study would seem to lend support to the recommendations of MacGillivray and Campbell [10] which stress that where neonatal care is adequate an increase in caesarean section from 30 to 34 weeks gestation is indicated, particularly when the second twin is presenting by the breech. However, the possibility of successful

external cephalic version of the second twin, following delivery of the first baby must not be forgotten as an acceptable alternative.

We have also observed in this study a lower perinatal mortality when mothers received regional analgesia in labour. Reduced fetal demise in this group is not surprising since many twin babies are premature; and the advantage of regional analgesia for premature singletons has already been demonstrated [9,16]. The use of caesarean delivery for the premature infant has been well documented [9]. Based on our own previous experience with high-risk pregnancies [11,12] we remain strong advocates of regional analgesia for twin delivery.

Our observations of a significant and sustained drop in perinatal mortality from 1979, coincide with the introduction of routine ultrasound scanning. This enabled early and more accurate diagnosis of multiple pregnancy, and permitted early implementation of intensive antenatal care and follow up. The year also marked the installment of additional advanced electronic equipment, for accurate and more objective intrapartum monitoring of both fetuses. It also heralded the arrival of a second neonatologist. Observations following such general improvement in the level of care provided are not unique, but shared by several authors [2,6,7,9,16,18].

The relative increase in fetal demise of the second twin (Table 5) when compared with the first, is well documented [3,20]. However, recent reports show this gap to be narrowing with improved intrapartum and neonatal care [5,20,21]. This new index of the quality of neonatal intensive care is already becoming apparent in the more recent years of our study (Table 5).

The obstetrician, in consultation with the neonatologist, should determine the optimum time and method of delivery of each twin pair and establish in their unit broad principles of management for twin pregnancies of different gestational age groups.

CONCLUSIONS

The reasons for a significant decrease in perinatal mortality in twin pregnancy, from about 100/1,000 to less than 40/1,000 in recent years, are multifactorial. We believe that no single factor, management regime, or treatment protocol, can claim entire responsibility for the universally decreasing trend in perinatal mortality in multiple pregnancy patients. Improved diagnostic techniques, intensive antenatal care, better and more accurate intrapartum surveillance, and high-quality neonatal intensive care, together with other less apparent factors, have all combined in varying degree, to produce the current desired trend. In this respect, we cannot overemphasise the need for close cooperation between the obstetricians and neonatologists.

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