



Perinatal Morbidity and Mortality Rates in Twin Pregnancies – A 15-Year Review Study from Athens

A. E. Liapis¹, D. K. Hassiakos¹, P. P. Panagopoulos²

¹Second Department of Obstetrics and Gynecology of the University of Athens, Areteion Hospital, Greece; ²Istituto di Clinica Ostetrica e Ginecologica Università di Padova, Italy

Abstract. There were 150 deliveries of twin pregnancies over 26 weeks in our hospital. The incidence of twin pregnancies was 1.0% in a population consisting of Greek nationals. Seventy five (50%) were term at delivery whereas 75 (50%) were premature (mean gestational age at delivery 36.5 weeks). The birth weight at delivery ranged from 350 grs to 4,050 grs with mean birth weight for the 1st and 2nd twin of 2,404 grs and 2,384 grs, respectively. One hundred and forty four (48%) neonates had weights between 1,501 to 2,500 grs. Twenty two (9.57%) neonates had weights between 1,501 grs to 2,500 grs. The perinatal mortality when birth weights exceeded 1,500 grs was 7.32%. In total, 186 (62%) newborns were delivered vaginally and 114 (38%) by cesarean section. Forceps were used in 4.33% of the cases and breech extraction was performed in 2.33%. The mode of delivery and perinatal mortality rates were not correlated for both twins ($p>0.05$). The most common causes of death were hyaline membrane disease (48.5%), immaturity (18.2%), congenital abnormalities (15.1%), septicemia (12.1%) and asphyxia (6.06%). Prematurity seems to constitute the most common cause of perinatal deaths while the mode of delivery found to be irrelevant to perinatal mortality.

Key words: Mode of delivery, Morbidity, Mortality, Twins

INTRODUCTION

Perinatal asphyxia and prematurity constitute the main causes of perinatal mortality, and twin pregnancies present a higher perinatal morbidity and mortality than singleton pregnancies [23]. It has been reported that the incidence of twins ranges from 0.7% to 1.6% [10, 14, 24]. The incidence of preterm newborn babies is 5 to 10 times greater in twin than singleton pregnancies [11]. Approximately 50% of all twins are born prematurely [2]. Special care to prevent prematurity has been taken in the recent years and early diagnosis and bedrest have been determined as being important preventive factors [20, 25].

The purpose of this study is to review the progress of labour, its effect on the choice upon the mode of delivery, the incidence of perinatal morbidity and mortality, as well as other complications during the delivery of twins that occurred from 1980 to 1994 in our hospital.

MATERIALS AND METHODS

The study population included all twin pregnancies at least completed 26 weeks of gestation and delivered at the 2nd department of Obstetrics and Gynecology of Athens University, at the Areteion Hospital, during the 15-year period from January 1, 1980 until December 31, 1994. All data used in this investigation were obtained from the patient records and included the course of the pregnancy and its management.

The gestational age was calculated according to the first day of the last menstrual period and ascertained by ultrasonography. In cases with uncertain gestational age serial ultrasonic examination was performed to determine the age of gestation and the probable date of delivery.

In all twin pregnancies, a reduction of every day activities as well as bedrest during the second half of gestation were advised. In cases of premature uterine activity, β -sympathomimetic agents such as ritodrine HCL per os or I.V., or salbutamol per os were administered and series of non stress test and ultrasonic examination were performed to evaluate fetal well being and intrauterine development.

Since twin pregnancies were considered to be high risk pregnancies, both fetuses were monitored during labour with an external fetal monitor. In many cases involving ruptured membranes the cephalic presentation of the first twin was monitored by means of an internal monitor.

All deliveries were performed by senior resident registrars or assistant professors, members of our staff. The delivery of the first twin was handled as in normal singleton pregnancies. After the delivery of the first twin, a vaginal examination was performed to determine the fetal presentation in order to facilitate the delivery of the second twin by adapting the cephalic or breech presentation into the pelvic inlet. For the delivery of the second twin artificial rupture of membranes and oxytocin administration, when necessary, were performed. If fetal distress was present, the delivery was completed by obstetric manipulation or by caesarean section.

RESULTS

During the study period there were 162 (1%) twin pregnancies derived from natural or induced cycles and 16,064 singleton pregnancies delivered in our hospital. Our study included 150 twin pregnancies delivered over 26 weeks of pregnancy from natural cycles. The mean \pm SD maternal and gestational age at the time of delivery was 27.7 ± 5.0 years and 35.2 ± 4.3 weeks, respectively.

The mode of delivery is shown in Table 1. In 92 (61.3%) twin pregnancies both fetuses (first-born twin A, second-born twin B) were delivered vaginally and in 56 (37.4%) both by caesarean section which was performed electively or as an emergency

Table 1 - Mode of delivery in relation to the first and second twin

Mode of delivery	Twin A	Twin B	Mortality		
			A	B	Total
Total vaginal deliveries	94 (62.6%)	92 (61.3%)	9	12	21 (63.6%)
Normal delivery					
vertex	74 (78.7%)	58 (63.1%)	11	12	
breech	13 (13.8%)	21 (22.8%)	2	2	
Forceps	7 (7.4%)	6 (6.5%)	1	1	
Version and/or extraction	–	7 (7.7%)	1		
Cesarean sections	56 (37.4%)	58 (36.7%)	5	7	12 (36.4%)

Table 2 - Mean birth weight and mortality rates by gestational age (mean \pm SD)

Gestational age(wks)	Deliveries (n)	mean BW(gr)		Mortality (n)		
		A	B	A	B	Total
26-28	5	890 \pm 189	850 \pm 154	4	4	8 (80.00%)
29-31	9	1322 \pm 355	1466 \pm 374	2	3	5 (27.70%)
32-34	13	1907 \pm 510	1763 \pm 462	2	3	5 (19.20%)
35-37	48	2366 \pm 350	2369 \pm 463	4	7	11 (11.50%)
>37	75	2746 \pm 420	2714 \pm 415	2	2	4 (2.66%)
Total	150	2404 \pm 619	2384 \pm 630	14	19	33 (11.00%)

procedure. In addition, two second-born twins were delivered by cesarean section after the vaginal birth of the first twin because of a transverse lie and a severe fetal distress. In total, 186 (62%) newborn babies were delivered vaginally and 114 (38%) by cesarean section. The overall incidence of breech presentation was 14% (4.6% for twin A and 9.4% for twin B). The mode of delivery and the perinatal mortality rates were not correlated for both twins ($p > 0.05$).

The number of deliveries in relation to the gestational age distribution at the time of delivery, as well as, the corresponding mean birth weight and perinatal mortality are also shown in Table 2. There were 94 (62.6%) term and 56 (37.4%) premature twin deliveries. The overall mean birth weight was 2,404.9 \pm 619.5 grs (ranged from 650 to 3,850 grs) and 2,384.3 \pm 630.1 grs (ranged from 650 to 3,950 grs) for the first and second twin, respectively ($p > 0.05$). Of the newborn babies 27 (9%) had weights ranging from 650-1,500 grs and 171 (57%) weighed less than 2,500 grs. In addition 129 (43%) had weights greater than 2,500 grs (Table 3).

Perinatal mortality and its relation to the birth weight and gestational age are shown

Table 3 - Mortality rates by birth weight

Birthweight (gr)	Newborn (n)	Mortality (n)		
		A	B	Total
650-1000	13	4	4	8 (61.5%)
1001-1500	14	2	3	5 (35.7%)
1501-2000	42	3	4	7 (16.6%)
2001-2500	102	3	6	9 (8.8%)
>2500	129	2	2	4 (3.1%)
	300	14	19	33 (11%)

Table 4 - Apgar Scores (mean \pm SD)

	Twin A	Twin B	
1 min	7.7 \pm 2.1	7.4 \pm 2.4	NS
5 min	8.3 \pm 1.8	8.1 \pm 1.6	NS

Table 5 - Comparison of twin pregnancy outcome by maternal age group

	Adolescent (n= 13)	Adults (n= 137)	
Gestation at delivery (wk)	36.15 \pm 2.73	36.6 \pm 3.0	NS
Birth weight A (gr)	2403 \pm 618	2405 \pm 621	NS
Birth weight B (gr)	2257 \pm 617	2396 \pm 632	NS
Preterm birth	4 (30.8%)	52 (38%)	NS
>37 weeks	9 (69.2%)	85 (62%)	NS

in Tables 2 and 3. Overall, of the 300 babies born, 33 (11%) died with a mortality rate of 42.4% and 57.6% for twins A and B respectively ($p > 0.05$). Prematurity (54.5%) was the main cause of death followed by intrauterine growth retardation (18.2%). Congenital abnormalities (15.1%), perinatal asphyxia (6.06%) and septicemia (12.1%) contributed to the remaining deaths.

The Apgar score values for the 1st and 5th minute for both twins are shown in Table 4. The overall mean \pm SD Apgar Score for the 1st and 5th minute were 7.7 \pm 2.1 and 8.3 \pm 1.8 for the first twin and 7.4 \pm 2.4, 8.1 \pm 1.6 for the second one, respectively. Overall, 39 (13%) newborn babies had Apgar scores values for the 1st minute of less than 7. The mode of delivery did not affect significantly the Apgar score values for both twins ($p > 0.05$).

Comparison of twin pregnancy outcome by maternal age group is shown in Table 5. As for the gestational age at delivery, the birth weight of the first and second twin as well as the proportion of preterm births in adolescent and adult gravidas, no statistical differences were found between them.

Using multiple regression analysis and considering the birth weight of the first twin as dependent variable and maternal age, gestational age at delivery and parity as independent variables, positive correlates were found for all gravidas ($r=0.8$, $p<0.001$), adolescent ($r=0.88$, $p<0.01$) and adult gravidas ($r=0.8$, $p<0.01$). Gestational age at delivery ($p<0.001$) and parity ($p<0.05$) were positive correlates for birth weight for all gravidas and adult gravidas as well ($p<0.001$, $p<0.05$ respectively) but for adolescent gravidas only the gestational age was found to be significant ($p<0.001$).

With regard to the fetal conditions, 8.7% of twins developed hyperbilirubinaemia ($Hb > 15\text{mgr}/100\text{ml}$) and 3.3% developed pulmonary septicemia or other infections. Blood transfusion was necessary in 3 cases.

Maternal morbidity was expressed with 8 (8.3%) cases of preeclampsia, 3 (3.1%) cases of placenta praevia, 1 (0.9%) case of urinary tract infection and 5 (4.2%) cases with postpartum haemorrhage.

DISCUSSION

Although perinatal morbidity and mortality rates for singleton pregnancies have declined over the last decades, those of twins have shown little change, with prematurity and its associated complications such as asphyxia, neurologic depression and chronic respiratory distress considered to be responsible for the greatest part of these rates [3, 7, 21].

Khrouf et al [10] reported that hyaline membrane disease (HMD) was responsible for 39.1% of the deaths recorded while the incidence of premature delivery was 45.92%. Bell et al [1] also reported that HMD was responsible for 23.8% of neonatal deaths. Of the twins constituting our material, 75 (50%) were born prematurely and accounted for 18 (54.5%) of perinatal deaths. Sixteen (48.48%) of those developed fatal hyaline membrane syndrome. Thus, prematurity was responsible for 54.5% of the total deaths encountered in our material (and perinatal mortality due to hyaline membrane disease was 48.48% of the total neonatal deaths). The mode of delivery was irrelevant to mortality rates. We followed aggressive management towards complications such as abnormal presentations and fetal distress. The preterm labour which was unavoidable appeared as the only complication contributing to mortality rates.

The correlation between perinatal mortality and fetal weight in our series was similar to that reported in the literature [9, 16]. In our study 27 (9%) of the twins had birth weights less than 1,500 grs and 13 of them (48.1%) died. There was a considerable improvement in perinatal mortality when birth weights exceeded 1,500 grs so that it decreased to 7.32%. The mortality rates of twin A and B differ only slightly and that because of occasional lower birth weight of twin B.

Mortality rates have shown a trend to decrease by gestational age. After the 34th gestational week when the lung maturity has been normally completed we have noticed a mortality rate of 6.1%. This can be attributed almost entirely to increased incidence of congenital anomalies and intrauterine growth retardation observed among twins. Other

authors have also documented an increased incidence of congenital anomalies in twin pregnancies [17].

Adolescent singleton pregnancies have more often preterm deliveries and low birth weight infants [21]. In order to elucidate the contribution of adolescent twin gravidas to the total mortality rate, we compared gestational age at delivery, birth weights and proportion of preterm births of adolescent and adult twin gravidas without statistical differences. Maternal age and parity were not associated with birth weight and only the length of gestation was found to contribute to birth weight of twin A for adolescent pregnant women. Social and economic status of adolescent twin gravidas, of course, play a role in favour of worse prognosis of gestation in comparison with adult twin gravidas. However, this seems to be negligible because of the small number of adolescent twin gestation in this study.

In our study and in agreement with other investigators [4, 7, 13, 19], a significantly higher morbidity rate was observed. This was mainly due to recurrent need of intensive care treatment often necessary in twin pregnancies. Probably this is relevant to prematurity and mode of delivery. Although we could not observe obvious differences in mortality rates between first and second twin in relation to mode of delivery, the second twin was more often referred to special nursery care. It is probable that the circulation of placenta deteriorates after the delivery of the first twin and the second twin becomes acutely hypoxemic [13, 15].

Intrauterine growth retardation (IUGR), congenital malformation and septicemia were present with similar incidence in both first and second twin. However, these findings were not statistically ascertained due to the small number of cases in our material.

It is generally accepted that twin pregnancies have an increased incidence of maternal complications in contrast to that observed in singleton gestations and this is a consequence of the increased burden on the maternal adaptive capacity [12]. In the present study the most common maternal complication was preeclampsia (8,3%); it was higher than singleton pregnancies but less frequent compared to data reported elsewhere for twins, and this could be explained by relatively middle to high socioeconomic status of our patients [6, 16, 22].

Placenta previa, urinary tract infections and postpartum bleeding were present in 3.1%, 1% and 4.2% of our cases respectively. We should also consider the difficulty of blood estimation after labour, where you must double the estimated blood loss to approximate the real loss and elucidate why these rates are low compared to the corresponding ones of the literature [5, 8, 18].

CONCLUSIONS

The high incidence of prematurity constitutes the major cause of perinatal morbidity and mortality for twin pregnancies. Either the gestational age and birth weights at delivery inversely contributes to the mortality rate. In twin pregnancies the mode of delivery seems to be relevant to morbidity rather than mortality rate.

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Correspondence: Assist. Prof. Angelos Liapis, 6 Antinoros Str., Hilton GR 11634, Greece.