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A Low Rate of Perinatal Deaths for Twin Births

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Abstract. A specific prenatal care program is proposed to prevent preterm deliveries in twin pregnancies, with ultrasound scanning, early work leave and home visits by mid-wives. A four-year study has been conducted on 197 pregnancies (160 early followed and booked and 37 late referred). It can be shown that early preterm births and very low birth weights are less frequent in the followed group than in published data, as well as in the late referred pregnancies. The total perinatal mortality rate is 25.6 per 1000 total births.

Key words: Prevention, Preterm birth, Twin pregnancies, Prenatal care

INTRODUCTION

Perinatal mortality rate remains a crude, simple way to evaluate the results of perinatal care for twins, the figures having been high for many years. A dramatic change has occurred in the kind of prenatal and perinatal care proposed to mothers of twins and it is time to measure if the results obtained by one team could be achieved elsewhere [14].

Perinatal mortality rates for twins are often close to 100 per thousand births. There is no obvious difference between series based on regional recruitment [1-6] or hospital recruitment. The deaths are related to several causes, mainly preterm birth and anoxia during labour. A specific cause is the higher rate of malformations in monozygotic twins. Some figures are different, higher in Nigeria [8] with poor neonatal care, or remarkably lower in Sweden [14] with all new inputs of perinatal care specifically designed for twin pregnancies.

The major cause of death in all these series is preterm birth. In a standardized comparison [1], no difference was found between the rates of perinatal mortality in twins (140 per mil) and singletons (146 per mil).

Table 1 - Perinatal Mortality Rates for Twins

	Author	Population	Rate (‰)
	Farooqui	USA	153
	Bleker	Netherland	140
	McNaughton	Scotland	60
	Fabia	Quebec	86
	Medearis	Missouri	92
	Keith	Michigan	80
	Grall	France	110
	Nylander	Nigeria	174
	Persson	Sweden	26

Mortality rate specific to birth-weight groups or pregnancy duration groups [2] are quite similar or even lower in twins compared to single births. Preterm birth rates are about 40% of all pregnancies when the definition used is that of less than 37 completed weeks [1-6]. Very early preterm birth rates are still very high: about 15% (less than 33 weeks [3,6]) to 18.4% (less than 34 weeks [2]). It has been proposed that a specific preventive policy with hospital bed rest may reduce these rates [14].

The distribution of birth weights for twins is obviously different than for singletons. But the important point is the high rate of very low birth-weight (less than 1500 g), about 10% of all births. This rate is known to be the best indicator of neonatal mortality risk [9, 12]. It is high as a result of the combination of shorter pregnancy duration and of intrauterine growth retardation. This shows clearly that the first point to be achieved is prevention of preterm birth. But other causes of perinatal jeopardy should not be forgotten, such as anoxia, either chronic deprivation with intrauterine growth retardation or acute anoxia during labour, which is more often observed in the second twin [14]. It has also been suggested that prolongation of gestation over 39 weeks in primiparas raises the risk of perinatal death [1].

PATIENTS AND METHODS

A series of 197 twin pregnancies was studied in our department at Clamart, a teaching hospital in a Paris suburb. The women were booked and followed by our team early in the pregnancy, or booked late when referred to us because of a complication. This center is a referral site for twin pregnancies and has in fact a two fold twin birth rate than in the general population (2.05% vs 0.92%) [4]. Most of the twin mothers (160/197 or 81.2%) were followed early.

There is in our institution a specific program for the prevention of preterm delivery in twin pregnancies. This includes a systematic ultrasound examination for all pregnant women between 12 and 14 weeks, which allows an early diagnosis of twinning as well as more precise knowledge of the pregnancy duration. This program proposes a specific twin clinic, run by obstetricians and midwives, where pregnant twin mothers can meet for information exchange and psychological support. It includes also a proposition of early work leave for women with physically stressful jobs or with long daily commuting time. Midwives are sent to the homes of these women each week for information and support. An important point seems to be teaching how to recognize uterine contractions, and also the relationship

between specific physical activities and the onset of uterine contractions. This program is the application to twin pregnancies of what we had already proposed for single pregnancies [10], but it is applied earlier, as soon as the diagnosis of twinning is certain, as soon as the risk of preterm birth is obvious.

This program does not include prenatal bed rest, at home or in hospital, in contrast with Persson [14] who applied systematic hospital bed rest of several weeks. There is no prescription of any drug for prevention of early onset of uterine contractions. If a preterm labour begins, before 34 weeks, with uterine painful contractions and modification of the uterine cervix, betamimetic drugs by intravenous perfusion are given. Betamethasone treatment is also proposed in these cases for prevention of hyaline membrane disease.

The second program proposed for twin pregnancies is a systematic ultrasound follow up of intrauterine growth. This is not applied for single pregnancies, where ultrasounds are only proposed when a specific indication is present. But for twin pregnancies, clinical surveillance and hormonal assays are of little or no value [11]. Intrauterine growth retardation is diagnosed when the physical values – biparietal, transverse, abdominal and femur length – are under the 10th centile of locally established curves for twin pregnancies [5].

Prolongation of gestation over 39 weeks is considered to raise the risk of intrauterine growth retardation and of perinatal mortality. An induction of labour is proposed in this event.

A policy for delivery is established, with elective cesarean section if the first twin is a breech, if the second is a breech before 34 weeks, or if one or both fetuses are growth retarded (under the 10th centile of twin growth curves for biabdominal diameter).

Cesarean section is also proposed if an abnormal tracing appears during labour for the second twin. A cesarean section may also be proposed during labour for maternal illness, as for single pregnancies. With all these indications, the cesarean section rate for twins in our institution has averaged 40% for the past ten years. All labours are followed with double monitoring ultrasounds for the second twin, and cephalic electrode for the first one.

A pediatric team is in the delivery room for each twin birth. There is no specificity for twins in neonatal care.

All pregnancies terminated at 24 weeks or more, or with a fetus of 500 g or more, are considered as births (including stillbirths). Early neonatal mortality is defined in the 0-7 days interval and late neonatal mortality in the 7-28 days interval. Perinatal mortality rate 1 is the combination of stillbirths with early neonatal mortality; perinatal mortality 2 is the combination of stillbirths with early and late neonatal mortality. The diagnosis of the cause of death is made by the local perinatal death committee which includes the pediatricians and the pathologists. This committee also advises on whether a death could have been avoided or not. Clinical information is summarized and computerized.

RESULTS

The results are presented separately for early followed pregnancies (2 prenatal visits before 28 weeks) and later referred ones:

- 1) Low rates of preterm birth can be observed in the early followed pregnancies (Table 2) but not in the late referred ones, the difference for very early preterm births (less than or equal to 32 weeks) being important.

Table 2 - Preterm Delivery among Twin Pregnancies: Antoine Bécclère Hospital, 1979-1983

Weeks of gestation		30	31 - 32	33 - 34	35	36	37 +	Total
Early followed	N	3	4	13	10	24	105	160
	%	1.8	2.5	8.1	6.25	15.0	65.6	100
Late referred	N	0	10	4	4	2	17	37
	%		27.0	11.0	11.0	5.4	45.9	100

Table 3 - Twin Pregnancies Distribution of Birth Weights: Clamart Maternity Hospital, 1979-1983

Birth weight (g)		1000	1000 1499	1500 1999	2000 2499	2500 2999	3000 +	Total
Early followed	N	3	9	35	107	142	24	320
	%	0.9	2.8	10.9	33.4	44.4	7.5	100
Late followed	N	2	5	25	19	13	10	74
	%	2.7	6.7	33.8	25.7	17.5	13.5	100

Table 4 - Perinatal Mortality

	Stillbirths (500 g up)	Early neonatal deaths (0-10 days)	Late neonatal deaths (7-28 days)	Perinatal deaths 1	Perinatal deaths 2
Early followed (N = 320 births)	2 6.25 ‰	4 12.5 ‰	1 3.1 ‰	6 18.7 ‰	7 21.8 ‰
Late referred (N = 74 births)	1 13.5 ‰	0	2 27 ‰	1 13.5 ‰	4 40.5 ‰
Total (N = 394 births)	3 7.6 ‰	4 10.7 ‰	3 7.6 ‰	1 17.7 ‰	3 25.4 ‰

- 2) The distribution of birth weight is shown in Table 3. In the early followed group, the rates of very low birth weight babies are higher than in single births, but lower than in the referred group.
- 3) The perinatal death rate can be lowered for twin births: as shown in Table 4, it is approximately twice the rate observed for single pregnancies, in the same institution, during the same period (25 per mil vs 12 per mil), and it is lower for early followed pregnancies than for late referred ones.
- 4) Causes of death are established by the local perinatal death committee (Table 5).

Among the three stillbirths, two are related to cord complications and one to a silent infection with beta streptococcus. All three were considered as nonavoidable; the first two were without any clinical warning and the third one was only preceded by an opening of the inner os of the cervix a few days before death in utero.

Among the four early neonatal deaths, two are related to a lethal malformation and the third to an anemia which could not be explained. The last one is related to a direct complication of preterm birth (hyaline membranes disease). It was considered as avoidable

Table 5 - Cause for Perinatal Deaths

Stillbirths

1	28 weeks, 700 g monozygotic monoamniotic pregnancy cord complication
2	30 weeks, 550 g Cord complication
3	38 weeks, 2180 g Streptococcus beta meningitis

Early neonatal deaths (0-6 days)

4	33 weeks, 800 g trisomy 13	First day death
5	35 weeks, 1380 g multiple malformations	First day death
6	37 weeks, 2500 g Unexplained anemia	First day death
7	31 weeks, 1480 g Hyaline membrane disease (in 1979)	

Late neonatal deaths (7-28 days)

8	31 weeks, 1400 g intraventricular hemorrhage and hyaline membrane disease (in 1979)
9	32 weeks, 1400 g intraventricular hemorrhage
10	34 weeks, 1980 g hyaline membrane disease (in 1980) and ulcero necrotising enterocolitis

since this case did not receive betamethazone treatment.

The three late neonatal deaths are all closely related to preterm birth and complications of immaturity. Case no. 8 is among the followed pregnancies and did also not receive betamethazone treatment. Cases no. 9 and 10 are among the late referred pregnancies and were considered to be unavoidable by the local team. No opinion could be given about the way these pregnancies were handled before referral.

It appears that immaturity related complications are no longer the main cause of perinatal death in twin births, 4 on 10 only as a global result. Better intrapartum care and better neonatal care were given. But reduction of very early preterm births and of very low birth weight births may have played a positive role.

DISCUSSION

The perinatal death rate can be reduced significantly. This was first claimed by Persson et al in 1979 [14]. Their results were really surprising, with a rate of 28.8 per mil when the rates prevalent at the time were of 60 per mil to 80 per mil or more.

The question raised was whether these good results should be attributed to the general system of perinatal care in Sweden, or to specific measures, which might then be applied elsewhere. We were interested to test this hypothesis.

When a comparison is made between Persson's program and the present study, it appears that the aims are similar, but the methodology may differ. Recognition of twinning

is an important aim, and it pursued in both studies through systematic ultrasound examination at least once, between 12 and 15 weeks.

The second point, the prevention of preterm birth, is addressed very differently in the two studies. Persson et al propose bed rest for at least six to eight weeks in the hospital; we propose reduction of physically stressful work and an education program.

For diagnosis of intrauterine growth retardation, aims and methods are similar and based on an echographic study of fetal growth. For delivery, the approach is also not very different, specific rules being adopted in both cases for the decision of a cesarean section, which is applied by all members of the obstetrical team.

An economical evaluation of the proposed program has been made within a historical comparison of two similar periods, before and after modifying our department policy rules [15]. This has shown a reduction of neonatal intensive care hospital costs by half, without reducing the costs for the care of the mothers of twins. This shows that not only the goal of a reduced perinatal wastage for twins was achieved, but also that neonatal care costs have been reduced at the same time.

This program could also hopefully address itself to the risk of neurological impairment and of mental retardation, which are so related to the very short duration of gestation and the very low birth weight. A slight modification in the distribution of birth weight may reduce by half the long standing costs of neonatal care for handicaps [13] of twin births.

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