Acta Genet Med Gemellol 40: 63-68 (1991)

Received 2 November 1989
Final 17 May 1990

The Effects of Hospitalization for Bed Rest on Duration of Gestation, Fetal Growth and Neonatal Morbidity in Triplet Pregnancy

C.A. Crowther[1], D.A.A. Verkuyl[1], M.F. Ashworth[1], C. Bannerman[2], H.M. Ashurst[3]

[1]Department of Obstetrics and Gynaecology, [2]Department of Paediatrics, Harare Central Hospital, Southerton, Zimbabwe; [3]National Perinatal Epidemiology Unit, Radcliffe Infirmary, Oxford, UK

Abstract. Nineteen women attending a special multiple pregnancy antenatal clinic with a triplet pregnancy were randomly allocated to either bed rest in hospital from 24 weeks gestation onwards until delivery, or to continue conventional outpatient management. Conclusions are limited by the trial size, but the study suggests that routine hospitalization for bed rest decreases the incidence of preterm delivery and light-for-gestational age infants and reduces the need for intensive neonatal care. Although still compatible with change variation, the observations, if confirmed in a larger randomized study, would have considerable implications for clinical practice. The policy needs further evaluation in a large multicentred collaborative study.

Key words: Hospitalization, Bed rest, Triplets, Preterm delivery, Birth weight, Neonatal morbidity

Triplet pregnancy is associated with a high incidence of preterm delivery and fetal loss from immaturity [2,6,10,15]. The incidence of triplet pregnancies has increased with the introduction of ovulation agents [10], and may continue to do so with the increasing use of techniques such as IVF and GIFT.

There are several retrospective, poorly controlled studies of hospitalization for bed rest in triplet pregnancy. Some of these suggest a reduction in the risk of preterm delivery [1,4,9]; others did not find that such a policy lengthened gestation [2,3,10]. All of these studies, except that reported by Daw [3], found that hospitalization for bed rest was associated with a reduced perinatal mortality rate.

Intrauterine growth of triplets tends to be slower than singletons from the 27th week of gestation [11]. Favourable effects on fetal growth with hospitalization for bed rest in triplet pregnancy have been reported [2,14].

If used, there is no consensus as to when bed rest in triplet pregnancy should begin, and in some reports this is unspecified. Advice ranges from "at home" as soon as the diagnosis is made with hospitalization from 28-30 weeks until delivery [10], to "from 24 weeks" [12] to the beginning of the third trimester, or "at the onset of complications" [15].

This is a report of the first randomized trial to compare routine hospitalization for bed rest with continued conventional outpatient management in triplet pregnancy.

MATERIALS AND METHODS

Women with a confirmed triplet pregnancy from 24 weeks gestation onwards attending the multiple pregnancy clinic at Harare Maternity Hospital, Zimbabwe, were considered for entry into the trial, which ran from 1984 to 1986. All the women were African. Women were excluded if they had an uncertain gestational age, a cervical suture, hypertension, cesarean section scar, or antepartum hemorrhage. Block randomization was used and researchers involved in treatment allocation were not involved in preparing the randomization schedule.

With consent, the next in a series of consecutively numbered, opaque, sealed envelopes was opened and the woman allocated according to the enclosed instructions for either hospitalization for bed rest (hospitalized group) or not (control group). The University Research Board gave approval for the study.

Women allocated to the hospitalized group were asked to come into the antenatal ward as soon after recruitment as was convenient. After admission, all were encouraged to rest in bed as much as possible although ambulation was allowed. The women received a normal hospital diet and antenatal assessments were made weekly.

Women allocated to the control group were encouraged to continue their normal activities at home, and were seen weekly at the antenatal clinic. They were admitted to hospital only if complications arose such as preterm labour, hypertension or preterm rupture of membranes. No pretrial estimation of study size was made. It was envisaged that the sample size would be small in view of the low incidence of triplets (1 in 2727 deliveries at Harare Maternity Hospital [2]) but it was decided as many women as possible would be recruited during the time available for the study.

All newborn infants were examined by a pediatrican (CB) who was unaware to which group the mother had been allocated. Dubowitz scoring [5] was used to confirm gestational age at delivery. The main outcomes were prespecified as preterm birth (defined as less than 37 weeks gestation) and light-for-gestational age (less than the 10th centile by local singleton standards).

Analysis was by the Student's t test or odds ratio as appropriate; 95% confidence intervals of the odds ratio were derived using the method recommended by Katz et al [7].

RESULTS

Randomization achieved two groups whose characteristics were comparable in a number of important respects (Table 1). Results were analysed according to initial allocation. All 10 of the women allocated to the hospitalized group were admitted and none required leave of absence from the hospital. Their mean length of antenatal stay was 38.3 days (SD 29.3). Six women of the 9 in the control group subsequently required admission to the hospital because of complications. The mean gestational age at admission was 32.9 weeks (SD 2.6), on average 4 weeks later than the hospitalized group and their mean length of antenatal stay was 7 days (SD 8.5).

Table 1 - Characteristics of the two study groups

	Hospitalized group (N = 10)			Control group (N = 9)		
	N	Mean	SD	N	Mean	SD
Age (yr)		25.2	5.5		29.3	7.4
Nulliparae	2			0		
Height (cm)		159	8.5		160	5.5
Weight at 28 wk (kg)		68.3	5.7		72.3	8.4
Previous preterm delivery	0			1		
Gestational age at entry (wk)		29.0	4.7		29.4	3.0

Pregnancy and fetal outcome details are given in Tables 2 and 3. All women went into spontaneous labour. Fewer women in the hospitalized group developed hypertension ($\geqslant$140/90mmHg) or had premature rupture of the membranes. Although all the differences observed are compatible with chance variation, the data suggest beneficial effects from hospitalization for bed rest, including a reduction in the incidence of preterm delivery and a decreased incidence of light-for-gestational age infants. As was predictable from the incidence of preterm delivery in infants whose mothers had received hospitalization for bedrest, a smaller proportion of these infants required admission to the Neonatal Care Unit and the mean length of stay on the Unit was less than for the control infants. One baby in the hospitalized group died during the perinatal period (a normally formed stillbirth) compared with three in the control group (all from immaturity) [17].

DISCUSSION

There is no consensus about the value of hospitalization for bed rest in triplet pregnancy. Formal evaluation of such a policy in randomized controlled trials is, however, difficult because of its low incidence. This is the first published report of such a ran-

Table 2 - Pregnancy outcome

	Hospitalized group (N = 10)		Control group (N = 9)		Sinificance p value	
	Mean	SD	Mean	SD		
Gestational age at delivery (wk)	34.4	2.2	33.7	2.5	NS	
Entry-to-study to delivery interval (days)	38.8	29.1	31.4	17.5	NS	
	N		N		Odds ratio	95% CI
Delivery < 37 wk	8		9		0.13	0.01-2.33
Delivery < 34 wk	3		4		0.56	0.09-3.42
Spontaneous labour	10		9		1.00	1.00-1.00
Vaginal delivery	8		9		0.13	0.01-2.33
Hypertension	1		3		0.26	0.03-2.27
Premature rupture of membranes	1		3		0.26	0.03-2.27

NS: not significant.

Table 3 - Fetal outcome

	Hospitalized group (N = 10)		Control group (N = 9)		Sinificance p value	
	Mean	SD	Mean	SD		
Birthweight						
Triplet I	2.06	0.45	1.89	0.43	NS	
Triplet II	1.91	0.25	1.87	0.27	NS	
Triplet III	2.02	0.61	1.70	0.38	NS	
All triplets	2.00	0.45	1.82	0.36	NS	
No. of babies	30		27			
	N		N		Odds ratio	95% CI
No. low birth weight (<2500g)						
Triplet I	8		9		0.13	0.01- 2.33
Triplet II	10		9		1.00	1.00- 1.00
Triplet III	8		9		0.13	0.01- 2.33
All triplets	26		27		0.13	0.02- 1.01
Light-for-gestational age						
Triplet I	5		3		1.91	0.32-11.28
Triplet II	7		5		1.80	0.29-11.08
Triplet III	3		6		0.25	0.04- 1.44
All triplets	15		14		0.93	0.33- 2.61
Neonatal unit						
Admissions	25		25		0.43	0.09- 2.07
Duration of stay	14.4		18.3			
Stillbirths	1		0		0.31	0.04- 2.33
Early neonatal deaths	0		3		0.11	0.01- 1.13

NS: not significant.

https://doi.org/10.1017/S0001566000006735 Published online by Cambridge University Press

domized study. The final sample size is average when considered with published case series of triplets. Nevertheless, it is only sufficient to identify large differential treatment effects confidently and this is reflected in the wide confidence intervals surrounding the odds ratios. The study does, however, suggest that beneficial effects on duration of gestation, fetal growth, and neonatal morbidity with a policy of hospitalization for bed rest compared with conventional outpatient management may await discovery.

Because these differences could be due to chance variation, they do not provide a basis for widespread adoption of the policy in clinical practice. Perhaps, the extra care and attention has by itself beneficial effects. If the differences were confirmed in a larger study, however, this would have considerable implications for care. To ensure an adequate sample size to be able to detect small but clinically important differences in outcome, a multicentred collaborative study is needed.

Acknowledgments. Special thanks to the midwifery staff and medical colleagues at Harare Maternity Hospital who cooperated with the study, and support from staff at The National Perinatal Epidemiology Unit, especially Dr. Iain Chalmers. Financial assistance for this work was provided by the University of Zimbabwe, and a generous grant from The Sims Black Trust.

REFERENCES

1. Berg G, Finnstrom O, Selbing A (1983): Triplet pregnancy in Linkoping Sweden 1973-1981. Acta Genet Med Gemellol 32:251-256.
2. Crowther CA, Hamilton RA (1989): Triplet pregnancy: A 10 year review of 105 cases at Harare Maternity Hospital, Zimbabwe. Acta Genet Med Gemellol 38:271-278.
3. Daw E (1978): Triplet pregnancy. Br J Obstet Gynaecol 85:505-509.
4. Dawood M (1973): Triplet pregnancy. Aust NZ J Obstet Gynaecol 13:15-20.
5. Dubowitz LSM, Dubowitz V, Goldberg C (1970): Clinical assessment of gestational age in the newborn infant. J Paed 77:1-10.
6. Itzkowic D (1979): A survery of 59 triplet pregnancies. Br J Obstet Gynaecol 86:23-28.
7. Katz D, Bapista J, Azen SP, Pike MC (1978): Obtaining confidence intervals for the risk ratio in cohort studies. Biometrics 34:469-474.
8. Keith LG, Ameli S, Depp OR, Hobart J, Keith DM (1988): The Northwestern University Triplet Study II: Fourteen triplet pregnancies delivered between 1981-1986. Acta Genet Med Gemellol 37: 65-75.
9. Kurtz GR, Davis LL, Loftus JB (1958) Factors influencing the survival of triplets. Obstet Gynecol 12:504-508.
10. Loucopoulos A, Jewelewicz R (1982): Management of multifetal pregnancies: Sixteen years experience at the Sloane Hospital for Women. Am J Obstet Gynecol 143:902-905.
11. McKeown T, Record RG (1952): Observations on foetal growth in multiple pregnancy in man. J Endocrinol 8:386-401.
12. Mueller-Heubach E (1984): Complications of multiple pregnancy. Clin Obstet Gynecol 27:1003-1013.
13. Nylander PPS (1971): The incidence of triplets and higher multiple births in some rural and urban populations in Western Nigeria. Ann Hum Genet 34:409-415.
14. Pheiffer EL, Golan A (1979): Triplet pregnancy. A 10 year review of cases at Baragwanath Hospital. J. Afr Med J 55:843-846.
15. Ron-El R, Caspi E, Schreyer P, Weinraub Z, Arieli S, Goldberg M (1981): Triplet and quadruplet pregnancies and management. Obstet Gynecol 57:458-463.
16. Saunders MC, Dick JS, Brown I, McPherson I, Chalmers I (1985): The effects of hospital admission for bed rest on the duration of twin pregnancy: A randomized trial. Lancet 793-795.
17. Wigglesworth J (1980): Monitoring perinatal mortality. A patho-physiological approach. Lancet ii: 684-687.

Correspondence: Dr. C.A. Crowther, Dept. of Obstetrics & Gynaecology, University of Adelaide, GPO Box 498, Adelaide, South Australia 5001.