

It may be concluded that within the limitations of the setting of this protocol, the fetal adrenal gland is sensitive to exogenous ACTH injection, that despite the increased circulating cortisol concentrations in the leading twin there is no difference in sensitivity of the adrenals of the first twin and the second, and that the processes of parturition alter some aspects of steroid secretory response to ACTH in the neonatal gland. Although stimulation of the adrenal gland by exogenous ACTH probably tests the maximal secretion of the adrenal cells rather than the natural endogenous levels induced by physiological concentrations of ACTH, the results of this study indicate that there is a change in the pattern of adrenal secretion as a result of parturition.

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A review of 367 triplet pregnancies

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Summary

Questionnaires were sent to 452 hospitals in the RSA and SWA/Namibia requesting information on triplet pregnancies over a 10-year period. Information on 367 sets of triplets from 150 hospitals was adequate for analysis. The incidence of triplets was 0,04% of all deliveries. As many as 45% of triplets were diagnosed during the first or second stage of labour. These infants had a significantly lower birth weight than those diagnosed at an antenatal clinic ($P < 0,01$). The mean birth weights of babies that died *in utero* or neonatally (within 7 days) were significantly lower than those in survivors ($P < 0,0001$). Caesarean section was the delivery method for 14% of 1 002 infants and perinatal mortality was improved for the second and third babies in comparison with second and third babies delivered vaginally ($P < 0,003$ and $P < 0,002$ respectively). It is concluded that the diagnosis of triplets should be made at the earliest possible stage of pregnancy, and that following adequate antenatal care all triplets should be delivered by caesarean section, except under ideal uncomplicated conditions where vaginal delivery may be feasible.

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The ideal delivery method of a triplet pregnancy is controversial. Twin pregnancies are delivered vaginally, except when obstetric indications for caesarean section exist. Quadruplets are delivered by caesarean section, but no standardized method for delivering triplets exists. Many experienced obstetricians may recall triplet vaginal deliveries with 'excellent' results, but published series on triplets are rare.¹⁻⁵ This study was therefore undertaken to evaluate the ideal method of delivery of a triplet pregnancy.

Patients and methods

Questionnaires were sent to 452 hospitals in the RSA and SWA/Namibia. The following information was requested for a 10-year period (January 1967 - December 1976): patient's age, race, gravidity, parity, the duration of pregnancy when the diagnosis of triplets was made, and the blood loss at delivery. Information about the method of delivery, birth weight, Apgar counts, and neonatal course of each baby was requested and analysed separately.

Delivery methods were classified into three groups: vertex, breech and caesarean section. Vertex deliveries included forceps and ventouse deliveries. Breech deliveries included spontaneous and assisted breech deliveries, as well as breech extractions after internal podalic version. Caesarean sections included those done for indications other than triplet pregnancy, e.g. previous caesarean section.

Births before arrival at a hospital were excluded from analysis. The different race groups were analysed together, except where interesting differences existed.

Results

Of the 452 hospitals approached, 270 returned the questionnaires. Full information was obtained from 106 hospitals, while 44 sent information on the delivery only and 120 returned unanswered

forms. Therefore, only 150 (33%) of the original 452 questionnaires were analysed; these included data on 367 triplet pregnancies.

The questionnaires analysed contained data on 870 920 deliveries of which 367 were triplet deliveries, an incidence of 1: 7 883 for Whites, 1: 2 258 for Blacks, 1: 7 610 for Coloureds, and 1: 2 373 (0,04%) for all patients combined. Of the patients with triplet pregnancies, 54% were booked into hospital, 35% were unbooked, and the booking status was unknown in 11%.

The triplets were diagnosed in an antenatal clinic in 148 patients (40%), during the 1st stage of labour in 37 patients (10%), during the 2nd stage in 130 patients (35%) and at an unknown time in 52 patients (14%). Triplets diagnosed in an antenatal clinic had a mean total weight of 5 864 g, those diagnosed during the first stage of labour 5 620 g, and those diagnosed during the second stage 5 260 g. These differences were statistically significant ($P < 0,01$).

The mean maternal age for Whites was 27 years, for Coloureds 30 years, and for Blacks 28 years. The youngest patient was 18 years of age and the oldest 49 years. For Whites the mean parity was 1,16, for Coloureds 3,52 and for Blacks 3,62.

The method of delivery was known for 1 002 infants; 481 (48%) were vertex deliveries, 379 (38%) breech deliveries and 142 (14%) were delivered by caesarean section. Vertex delivery was the chief form for the first- and last-born infants, but for the second baby a breech delivery was most common. These differences

were not statistically significant. Blood loss at delivery was reported in 229 patients; in 33% it was less than 300 ml, in 33% between 300 ml and 499 ml, and in 34% 500 ml or more.

Birth weights were reported in 335 patients for 1 005 infants. The mean weight for the first baby was 1 909 g, for the second 1 891 g, and for the third 1 843 g. These differences were not statistically significant. However, a highly significant difference was found between mean birth weights of babies who had died *in utero* or during the neonatal period (the first 7 days) and babies who survived ($P < 0,0001$) (Table I).

Apgar counts were correlated with birth weight and method of delivery. The higher the birth weight, the higher the 5-minute Apgar count ($P < 0,0001$) (Table II). Correlating Apgar counts with the method of delivery, the only significant difference was a higher 5-minute Apgar count for the third baby when delivered by caesarean section ($P < 0,03$) (Table III). Furthermore, the chance of survival for the third baby was improved when delivered by caesarean section compared with other delivery methods ($P < 0,025$) (Table IV).

The perinatal mortality was 130/1 000 births for the first baby, 154 for the second, and 262 for the third. These rates were corrected for babies under 1 000 g, but were uncorrected for those with congenital abnormalities. When the second and third babies were delivered by caesarean section perinatal mortality was significantly lower, e.g. 24/1 000 for the second ($P < 0,003$) and 136/1 000 for the third baby ($P < 0,02$).

TABLE I. MEAN BIRTH WEIGHT AND SURVIVAL IN 1 005 INFANTS

	Intra-uterine death		Neonatal death		Alive		P value
	g	%	g	%	g	%	
First baby	1 381	6	1 261	14	2 057	80	< 0,0001
Second baby	1 499	6	1 288	16	2 083	78	< 0,0001
Third baby	1 749	12	1 316	21	2 023	67	< 0,0001

TABLE II. MEAN BIRTH WEIGHT AND 5-MINUTE APGAR COUNT IN 1 005 INFANTS

	Mean birth weight (g)			P value
	Apgar 0	Apgar 1 - 7	Apgar 8 - 10	
First baby	1 208	1 343	2 051	< 0,0001
Second baby	1 449	1 466	2 043	< 0,0001
Third baby	1 648	1 621	1 977	< 0,0001

TABLE III. METHOD OF DELIVERY AND 5-MINUTE APGAR COUNT IN 1 005* INFANTS

Method of delivery	Apgar 0 (%)	Apgar 1-7 (%)	Apgar 8-10 (%)	P value
First baby				
Vertex	7	11	80	NS
Breech	10	10	78	
CS	2	14	82	
Second Baby				
Vertex	8	21	69	NS
Breech	8	13	77	
CS	2	21	75	
Third Baby				
Vertex	18	19	61	< 0,03
Breech	11	24	64	
CS	2	18	80	

*One case included as vaginal delivery for all 3 infants for whom the method of delivery was not specified on the questionnaire.
CS = caesarean section; NS = not statistically significant.

TABLE IV. METHOD OF DELIVERY AND FETAL SURVIVAL RATE IN 1 005* INFANTS

Method of delivery	Intra-uterine death (%)	Neonatal death (%)	Alive (%)	P value
First baby				
Vertex	5	13	80	NS
Breech	6	10	82	
CS	2	6	90	
Second baby				
Vertex	5	20	74	NS
Breech	9	10	79	
CS	2	8	89	
Third baby				
Vertex	15	20	64	< 0,025
Breech	15	20	64	
CS	2	17	80	

*One case included as vaginal delivery for all 3 infants for whom the method of delivery was not specified on the questionnaire.
CS = caesarean section; NS = not statistically significant.

TABLE V. INCIDENCE OF TRIPLET PREGNANCIES

	Total No. of deliveries	Incidence/1 000
South Africa (present study)		
White	220 751	0,12
Black	467 517	0,44
Coloured	182 652	0,13
Nigeria¹		
Igbo-Ora	6 160	1,62
Ibadan	21 940	1,78
Ilesha	10 800	1,94
UK¹		
England and Wales	5 956 220	0,10
USA¹		
White	23 751 611	0,09
Black	3 946 146	0,14
Sweden ¹	3 188 149	0,13

Discussion

The incidence of triplet pregnancy found in this study is similar to that reported for Europe and the USA but much lower than Nigeria's rates (Table V).

The most significant finding of this study is the direct correlation between survival and birth weight. Not only did the smaller infants lack adequate placental support, but they were diagnosed at a later stage of pregnancy — often at delivery. Babies born after 34 weeks' gestation or with a birth weight of 2 000 g or more have an excellent chance of survival.^{4,5} Conversely, birth weights under 1 500 g or a gestational age of under 33 weeks have impaired survival rates.⁴ It is therefore of utmost importance that the diagnosis of a triplet pregnancy should be made at the earliest possible stage of pregnancy.

How should triplets be delivered? The results of this study indicate a significantly improved perinatal mortality for the second and third babies when delivered by caesarean section. Factors that increase the perinatal loss during delivery are low birth weight and prematurity, undiagnosed second and/or third

fetus, increase in delay between delivery of each fetus, poor monitoring of second and/or third fetus during labour, and manipulative procedures during delivery. The later-born infants are especially at risk.⁶ Taking all these factors into account, as well as the results of this study, caesarean section is the delivery method of choice for triplets. In contrast to this view, Itzkowic⁴ considered vaginal delivery as reasonable after 34 weeks' gestation in uncomplicated triplet pregnancies. However, in his review of 59 triplets all 27 babies delivered by caesarean section survived, while the 9 stillbirths and 32 neonatal deaths all followed vaginal delivery. Furthermore, in a recently published series of 35 triplets from the Sloane Hospital for Women 6 neonatal deaths occurred; all of them were infants born second or third and only 1 of them was delivered by caesarean section.⁵

Although the results of this study provide substantial evidence for a policy of caesarean section for all triplet births, the fact that 45% of the triplets were undiagnosed before labour should not be overlooked. Improved antenatal care should improve perinatal mortality, regardless of method of delivery. Therefore, we believe that all triplets should be delivered by caesarean section, except under ideal conditions where a vaginal delivery is permitted. These ideal conditions should comprise adequate antenatal care, absence of maternal disease, e.g. hypertension, a pregnancy of more than 34 weeks or estimated fetal weights of 2 000 g or more per fetus, continuous surveillance of every fetus during labour, and suitable conditions for speedy, atraumatic delivery, as well as adequate neonatal facilities.

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