Clinical Topics

Mode of delivery and survival in babies weighing less than 2000 g at birth

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Summary and conclusions

A retrospective study of babies weighing less than 2000 g at birth admitted over a four-year period to Nottingham City Hospital Neonatal Unit showed a higher incidence of lower Apgar scores and the need for intubation in babies born by caesarean section and breech deliveries. Mortality in those delivered by the breech (35%) was statistically higher than those by caesarean section (10%) or vertex (14%). It is concluded that small babies born by breech delivery have a higher mortality than when delivered vaginally and should have the benefit of caesarean section.

Introduction

The care of preterm and growth-retarded babies has improved in the past two decades, and this has been reflected in the better survival figures for very low-birth-weight babies. Neonatal units can now achieve survival of around 80% for the 1001-1500 g group and over 50% for the 751-1000 g group.¹⁻³ Nevertheless, if one excludes lethal congenital abnormalities over two-thirds

variable is the route and mode of delivery. In this study we found that breech delivery was associated with an unacceptably high neonatal death rate.

Patients and methods

We identified from the admission book all babies weighing between 750 and 2000 g admitted to the neonatal unit at Nottingham City Hospital, a sub-regional centre, during the four-year period 1 January 1976 to 31 December 1979. During this period 783 babies weighing 750-2000 g were admitted to the unit. Thirty-six sets of notes were unobtainable, and 19 babies had lethal congenital abnormalities; this left 728 babies in the study, 143 (19.6%) of them from multiple pregnancies. Their case notes were reviewed and the following information extracted: birth weight, year of birth, mode of delivery, Apgar score at one minute, need for intubation at delivery, mortality, and presence of lethal congenital abnormalities. Condition at birth was assessed from the Apgar score at one minute, Apgar less than 3 indicating poor condition and the need for intubation and intermittent positive-pressure ventilation.

The information was stored on punch cards to facilitate analysis. Statistical analysis was by χ^2 using Yates's correction for continuity as fourfold tables were used.

TABLE I—Yearly survival figures in babies weighing <2000 g, 1976-9. (Excluding congenital abnormalities)

Year	751-1000 g			1001-1500 g			1501-2000 g			751-2000 g		
	No	Survived	%	No	Survived	%	No	Survived	%	No	Survived	%
1976	17	4	23	36	24	67	94	92	98	147	120	82
1977	16	7	44	57	43	75	110	105	95	183	155	85
1978	22	9	41	56	41	73	115	108	94	193	158	82
1979	28	19	68	75	63	84	102	98	96	205	180	88
Totals	83	39	47	224	171	76	421	403	96	728	613	84

of the deaths occurring in the first week of life are babies weighing under 2500 g.^{4,5} Most of these deaths are caused by respiratory failure and intraventricular haemorrhage.⁵ There is good evidence that the incidence and severity of both these conditions are increased by adverse factors operating at, or immediately before, the time of delivery. The experiences of the delicate immature infants in the minutes before birth have a profound effect on their chances of surviving. One obvious

Results

During 1976-9 the survival rates improved and are comparable with other units¹⁻³ (table I). Of the 728 babies admitted, birth of 401 was by vertex (55%), 148 of which were assisted by forceps, 102 by breech (14%), and 225 by caesarean section (31%).

Babies born by caesarean section and breech delivery were more likely to have low Apgar scores than vertex deliveries (figure), the differences being highly statistically significant ($p < 0.001$). A similar trend was found in the need for intubation, caesarean section and breech babies being intubated more often than vertex deliveries (figure). The two criteria showed that babies born by caesarean section and breech delivery were in worse "condition" at birth than those born vaginally by vertex. The need for intubation correlated well with mortality in each mode of delivery (table II). The death rates of intubated infants were significantly higher than the non-intubated in both the vertex ($p < 0.001$) and caesarean section ($p < 0.01$) births. The rates were high in both groups of breech births, and the difference was not statistically significant ($p < 0.5$).

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TABLE II—Death rate in non-intubated and intubated babies by mode of delivery

	Intubated			Non-intubated			p
	Total	Died	%	Total	Died	%	
Vertex	87	28	(32)	313	31	(10)	<0.001
Breech	53	22	(41)	49	14	(29)	<0.5
Caesarean section	113	18	(16)	112	5	(4)	<0.01

The death rates by modes of delivery gives an overall rate for breech deliveries of 35% compared with 14% by vertex and 10% by caesarean section. In the very low-birth-weight babies (750-1000 g) the figures were breech 65%, vertex 62.5%, and caesarean section 20%, showing that, at the very least, birth by caesarean section does not limit the chances of survival (table III).

TABLE III—Combined survival figures in weight groups by mode of delivery

Type of delivery	750-1000 g		1001-1500 g		1501-2000 g		750-2000 g	
	No	Deaths (%)	No	Deaths (%)	No	Deaths (%)	No	Deaths (%)
Vertex	40	25 (62)	119	24 (20)	242	7 (3)	401	56 (14)
Breech	23	15 (65)	36	16 (44)	43	5 (12)	102	36 (35)
Caesarean section	20	4 (20)	69	13 (19)	136	6 (4)	225	23 (10)
Total	83	44 (53)	224	53 (24)	421	18 (4)	728	115 (16)

Numbers of babies having Apgar 0-3 and requiring intubation by mode of delivery (750-2000 g).

Discussion

In 1974 Stewart and Reynolds⁶ drew attention to the possibility that breech delivery increased the death rate of preterm infants, though their figures did not reach statistical significance; ours do. A Swedish study⁷ of 62 000 deliveries (1952-70) showed increased perinatal mortality in preterm breech deliveries over other modes. More recently other workers have shown that caesarean section benefits small babies both in short-term survival and long-term morbidity,⁸ this concurred with Fanaroff and Merckatz's⁹ opinion in an overview of obstetrical management of low-birth-weight babies. Ingemarsson and his co-workers¹⁰ found morbidity was lower in preterm babies born by caesarean section compared with breech delivery in two different fixed five-year periods.

The "condition at birth" as assessed from the Apgar score at one minute, and the need for intubation was less satisfactory in babies born by breech and caesarean section delivery. The fact that babies delivered by caesarean section do well subsequently

in contrast to breech deliveries probably reflects the temporary effects of anaesthesia and the absence of the stimulatory action of vaginal delivery. The death rate of intubated babies (table II) in each type of delivery was higher than their non-intubated counterparts. The higher death rates of both intubated and non-intubated breech deliveries suggests that both groups suffer damage that may not be obvious at delivery.

It is not difficult to see why preterm breech babies should encounter problems. They offer increasingly larger parts for passage through a cervix. This, combined with cord entrapment and rapid distortion of the head, increases the likelihood of intracranial haemorrhage and occipital diastasis.¹¹ We accept the practical problems encountered in preterm labour, the difficulty in assessing fetal size and presentation, the chance that a severe antepartum haemorrhage has precipitated problems, the relative

risks of operative procedure to the mother, and that the patient may have reached full or near full dilatation on admission, thereby negating caesarean section. Nevertheless, our findings add strong support to the recommendations of others that, whenever possible, preterm infants of 26-34 weeks' gestation, presenting by breech, should have the benefit of a caesarean section. When this is not possible careful management of the second stage of labour is essential.

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