

MANAGEMENT OF PREMATURE RUPTURE OF FETAL MEMBRANES

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In the division of Obstetrics and Gynaecology at the University Hospital of the West Indies, a fairly conservative attitude had characterised the management of premature rupture of fetal membranes. All such patients not in established labour after 24 hours were treated by bed rest, antibiotics and "wait and see" policy. The antibiotics used in more than 95 per cent of cases were procaine penicillin, 600,000 units b.d., and Streptomycin one gm. daily or b.d., continued for five days or longer where indicated. The purpose of the present study, especially in view of the consistency of management in the past, was to evaluate this form of treatment and, if possible, to throw some light on aetiological factors. And, also to see if another method of management might improve the results.

Material and Methods

During the five year period January 1963 to December 1967, there were 10,105 deliveries in this hospital; 650 patients were admitted with a presumptive diagnosis of early rupture of the membranes. These case records have been reviewed; 16 unbooked cases were excluded; 179 were excluded because the diagnosis was not confirmed.

Patients admitted with a clear history

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of early rupture of the membranes, but who on admission were in established labour were not included in this series. The diagnosis of early rupture of the membranes was confirmed in 455, an incidence of 4.4 per cent.

The diagnosis of premature rupture of the membranes was based on history, examination on admission, including speculum examination with aseptic technique, and subsequent careful observation. Specific tests for liquor were not done.

Results

(a) Parity and Age -

TABLE I

Parity

Parity	Percentage of cases	
	All delivered patients	Early rupture of the membranes group
0	47.7	31.2
1 - 5	38.8	44.4
6 - 9	12.3	19.8
10-14	1.2	4.6

Tables I and II compare the early rupture group and all delivered patients in respect of parity and age. The general trend indicates some relation between early rupture of the membranes and increasing parity as well as age, although

the only marked difference is in the age group 35-39 years.

TABLE II

Age (years)	Percentage of patients	
	All delivered patients	Early rupture group
15	3.2	0.9
16-19	21.0	13.4
20-24	27.0	21.5
25-29	16.9	20.6
30-34	18.7	20.0
35-39	9.3	19.2
40	3.9	4.4

(b) Previous History

The 455 patients in the early rupture group had a total of 1,382 previous pregnancies. Premature rupture of the membranes is known to have occurred in at least 114 of these, an incidence of 8.2 per cent, about double the incidence in all delivered patients. If the 455 cases in the series are included, the incidence is 569 cases in 1,837 deliveries, or 30.3 per cent.

(c) Blood Group

Behrman *et al* (1960) discussed the possibility of an association between premature rupture of the membranes and ABO blood group incompatibility. We found no significant difference.

TABLE III
Blood group

Blood Group	Percentage of patients	
	All delivered patients	Early rupture group
O	54.61	49.0
A	20.39	23.5
B	21.74	23.1
AB	3.26	4.4

(d) Lie and Presentation of Fetus

The lie and presentation of the fetus appears to have some influence on the incidence, as well as on the outcome of this condition (Table IV). In 423 cases, the lie was longitudinal, vertex presenting, but there were 22 breech presentations, twice the expected number; 4 transverse lies, four times the expected number; and six sets of twins, a normal incidence of twin pregnancy.

Management and Outcome

(a) Interval between Rupture of Membranes and Delivery

Table V compares the rupture-delivery interval in the various gestational age groups. In this series, two-thirds of the cases occurred at or beyond the 36th week of gestation. The likelihood of a

TABLE IV
Presentation

Presentation	Early rupture group		Perinatal loss group		Mortality %
	No.	%	No.	%	
Vertex	423	93.0	33	75.0	7.8
Breech	22	4.8	6	13.6	27.3
Transverse lie	4	0.9	3	5.8	75.0

Six pairs of twins, with a perinatal loss of two not included.

TABLE V
Rupture—Delivery Internal

Maturity in Weeks	Rupture-delivery interval cases by groups (Percentage)				Per- centage of early rupture group	Per- centage of perinatal loss
	0-24 hrs.	24-48 hrs.	48 hrs. -1/52	<1/52		
20-28	21.4	28.6	14.0	36.0	2.6	31.8
29-32	16.6	14.5	42.9	26.0	7.7	34.1
33-35	37.1	19.4	30.5	13.0	23.1	11.3
36+	69.4	18.0	9.6	3.0	66.6	22.8
No. of cases	258	86	75	36		
No. of deaths	8	12	14	10		
Percentage of cases	56.8	18.8	16.5	7.9		
Percentage of deaths	18.1	27.3	31.8	22.8		

pregnancy continuing for more than one week in this group is only 3 per cent, and none continued beyond two weeks. In spite of antibiotic cover, there were ten cases of fetal loss in this group; 22.8 per cent of total mortality.

In the group where membranes ruptured between 33 and 35 weeks, more than 50 per cent were delivered before 48 hours and a further 30 per cent within the first week. Only 13 per cent continued for more than one week, with a maximum of six weeks.

The question arises here whether this slight gain in a few cases justifies the risk to the group as a whole. Probably, at this stage of gestation, each case should be judged on its merits. A good sized in-

fant, even if only at 33 or 34 weeks gestation, is probably safer delivered than remaining in a potentially infected uterus.

In the cases where rupture occurred at or before the 32nd week, more than 25 per cent continued longer than three weeks.

However, the loss from prematurity alone is high and the risks from infection must be balanced against the gain from greater maturity. Our results do not point clearly to any major advantage of conservative management as against early delivery.

(b) *Duration of Labour*

Table V shows that labour was not prolonged after early rupture of the mem-

TABLE VI
Duration of Labour

Hours in Labour	Percentage of cases in series	Perinatal loss group	
		No. of cases	Percentage of cases
0-5	48.3	26	59.1
6-10	29.5	8	18.2
11-20	17.4	8	18.2
More than 20	4.8	2	4.5

brane. Over 75 per cent of patients were in labour for less than ten hours and there was no increase in perinatal loss with increased duration of labour.

Fetal Mortality

(a) Rupture—delivery Interval

The total loss in this series was 44 cases, an incidence of 9.7 per cent including 22 stillbirths and 22 neonatal deaths.

It can be seen from Table VII that a short rupture-delivery interval is favourable to the fetus and that an interval in excess of 48 hours results in almost a two-fold increase in fetal loss as compared with an interval of less than 48 hours. This applies in all maturity groups, so prematurity is not the only factor. In this series, there were four deaths of infants weighing over 5½ pounds that were allowed to remain undelivered for longer than 48 hours, and three more who were delivered between 24 and 48 hours.

(b) Prematurity

There is no doubt that prematurity is an important associated factor. The overall incidence of infants weighing less than 2,500 grammes in this series was 34 per cent. Of these, 16 cases or 3.5 per cent, weighed less than 1,000 grammes, and the mortality in this group was 100 per cent, 36.4 per cent of the total fetal loss (Table VIII).

The importance of prematurity is further brought out by the fact that 66 infants (14.3 per cent) weighed less than 2,000 grammes, and the perinatal loss in this group was almost 70 per cent. From these figures it can be argued that it might be better to terminate all pregnancies with early rupture of the membranes in order to shorten rupture-delivery interval and improve fetal salvage. But it is also true that about one third of this group after

TABLE VII
Rupture-Delivery Interval and Mortality

Period of Gestation (weeks)	<48 Hours			>48 Hours			Total		
	Total Nos.	Perinatal deaths	Percent deaths	Total Nos.	Perinatal deaths	Percent deaths	Total Nos.	Perinatal deaths	Percent deaths
20-28	8	5	62.5	9	9	100	17	14	82.4
29-32	15	5	33.3	10	10	45.5	37	15	40.5
33-35	58	2	3.4	3	3	6.0	108	5	4.6
36+	260	8	3.1	2	2	6.1	293	10	3.4
TOTAL	341	20	5.8	114	24	21.1	455	44	9.7

TABLE VIII
Birth Weight and Perinatal Mortality

Birth Weight in grammes	Whole series		Perinatal loss		Group
	No.	%	No.	%	
.1000	16	3.5	16	36.4	
1.001-12,000	50	10.8	14	31.8	
2,001-2,500	95	20.5	5	11.4	
2,500-	300	65.1	9	20.5	

rupture of the membranes will continue to grow in utero for more than two weeks, (Table V), which may increase its chances for survival.

(c) Infection

There were 25 cases in this series with obvious clinical evidence of infection, an incidence of 5.5 per cent. These were severe cases with a temperature above 100°F on more than one occasion, and obviously infected liquor. There was a fetal loss of 60 per cent, including 13 stillbirths and 2 neonatal deaths in this group. In all but three cases, the interval between rupture and the initiation of antibiotic therapy was greater than 24 hours and the rupture-delivery interval on the average four days.

Most of these patients responded rapidly after delivery to further antibiotic therapy. In one case, severe infection led to a pelvic abscess, necessitating laparotomy and drainage, and a total hospital stay of 55 days. There were no maternal deaths.

Apart from the 44 fetal deaths, there were fifty other infants in this series with an Apgar score at birth of four or less, a total incidence of 12.1 per cent. These constituted a very heavy load on the Nursery and Paediatric services. In a unit where such care was not available, the fetal mortality and morbidity would be much higher.

Management

It is clear from this study that all patients beyond 36 weeks gestation should be induced if they are not in established labour within a few hours after early rupture of the membranes. This group constitutes at least two-thirds of all patients and this line of management should reduce the fetal mortality. There is probably no special risk to the fetus of more than eight months gestation, which is delivered within 24 hours following rupture of the membranes.

Before 36 weeks the position is not so simple. Apart from the risks associated with transverse lie and prolapse of the cord (three cases in this series) the two main problems at this stage are infection and prematurity, and the latter is probably the more important. However, two infants weighing 4-5½ pounds in this series died as a result of severe intrauterine infection. Even with complete bed rest, the chance of prolonging pregnancy more than one week is only about 10-15 per cent. Therefore, in this group also, labour should be induced if the fetus is of a size compatible with dates. Before 32 weeks, prematurity is the chief problem and it is probably wise to try to prolong the pregnancy while making every effort to guard against infection.

No speculum or vaginal examination should be done unless induction and early delivery are anticipated. There is little

evidence that antibiotics improve the prognosis for the fetus, but there is little doubt that they reduce the risk of maternal morbidity and mortality. In this series of patients, there was only one serious maternal infection, but the picture might have been very different if prophylactic antibiotics had not been used. As to the choice of antibiotics, Penicillin and Strep-

tomycin are probably effective, but recently Ampicillin has been shown to be effective against a wide range of organisms.

Reference

1. Behrman, S. J., Buether-Jamisch, J., Heggas, R., Gershowitz, H. and Ten, W. L.: Amer. J. Obst. and Gynec., 79: 847, 1960.