

# PREMATURE RUPTURE OF MEMBRANE—A CLINICAL AND BACTERIOLOGICAL STUDY

By

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## SUMMARY

A controlled, prospective study of 78 cases of premature rupture of membranes was carried out. Inflammation of amniotic fluid was found in 46.1% of cases, *E. coli* being the commonest offender. Perinatal mortality was high (11.5%), and there was definite increase in maternal morbidity. These cases should be promptly treated with antibiotics and labour induced early.

### Introduction

Intact membranes have been considered to be a barrier to infection to amniotic fluid and foetus (Miller, 1980). Rupture of membranes for a prolonged time before labour supervenes, is a real threat to amnion and foetal survival (Santosh, 1984). The cause of premature rupture of membranes is generally not clear and so treatment is not satisfactory. This study was carried out with a view to find out various clinical and pathological events that follow premature rupture of membranes.

### Material and Methods

The study population consisted of all pregnant women with leaking or rupture of membranes prior to onset of labour, admitted to the labour ward of VSS Medical College Hospital during a period of 18 months from 1st January 1985 to end of June 1986. Those already receiving anti-

biotics were excluded. A number of cases having mature rupture of membranes were taken as control. In doubtful cases of watery vaginal discharge, presence of amniotic fluid was confirmed by arborization test (Gupta *et al*, 1977).

A detailed history was taken in each case including age, parity, time of PROM and any pyrexia, tachycardia, uterine tenderness and other signs of intrauterine infection was noted. A cervical swab was taken in each case and amniotic fluid was collected by catheter. Both samples were submitted to culture. No antibiotics were given till completion of labour. The time and duration of labour was noted. Samples of placental tissue, membranes and cord were preserved for histopathological study, as also sample of decidua. Swabs from the nasopharynx of newborns were also sent for culture. Cases were followed up in the puerperium for evidence of puerperal and neonatal infection.

### Results and Discussion

There were in all 78 cases with premature rupture of membranes and 25 cases

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*Accepted for publication on 27-7-87*

were studied as control. Both groups matched in age and parity. In both groups about 76% belonged to the low socioeconomic status

Wideman *et al* (1964) found increased incidence of PROM in mothers with severe ascorbic acid deficiency which is quite common in mothers of low socioeconomic group.

*Period of Gestation:* About 66% of the study and all of the control cases were after completion of 36 weeks of pregnancy as can be seen in Table I.

TABLE I  
*Period of Gestation*

Weeks of Pregn.	Study group N=78		Control group N=25	
	No.	%	No.	%
29-32	9	11.50	0	0
33-36	18	23.10	0	0
37	51	65.40	25	100.0

The latent period was less when the duration of pregnancy at PROM was more. Thus 82.4% went into labour within 24 hours when the period of gestation was beyond 36 weeks.

In the study group, 50% of patients completed labour in 8 hours and 84.6%

did so within 16 hours. In controls all patients delivered within 16 hours.

#### *Incidence of Amnionitis in Relation to Latent Period*

Out of 78 cases, 27 (34.6%) developed amnionitis. In all these cases the latent period was more than 24 hours as can be seen in Table II.

TABLE II

L. P. in hours	Cases developing amnionitis	
	No.	%
Less than 24 Hrs. N=42	0	0
More than 24 Hrs. N=36	27	75.0
Total N=78	27	34.6

#### *Cervical SWAB Culture*

The pathogenic organisms grown in cervical culture of both groups is shown in Table III.

#### *Amniotic Fluid Culture*

The result of Amniotic fluid culture is shown in Table IV.

TABLE III

Organisms	Study N=78		Controls N=25	
	No.	%	No.	%
<i>E. coli</i>	23	29.5	1	4.0
<i>Str. haemolyticus</i>	2	2.6	0	0.0
Gr. B <i>Klebsiella</i>	6	7.6	1	4.0
<i>Ps. aeruginosa</i>	2	2.6	1	4.0
Total	33	42.3	3	12.0

TABLE IV

Pathogenic organisms	Study gr. N=78		Controls N=25	
	No.	%	No.	%
<i>E. coli</i>	23	29.5	0	0
<i>Str. haemo. Gr. B</i>	2	2.6	0	0
<i>Klebsiella</i>	2	2.6	0	0
<i>Ps. aeruginosa</i>	7	8.8	0	0
<i>Proteus</i>	2	2.6	0	0
Total	36	46.1	0	0

It is of interest to note that, whereas amniotic fluid was negative in all, the cervical culture was positive in 12% of the controls. The culture results of the study group was almost similar. Santosh *et al* (1984) had similar findings. *E. coli* was the common offender whereas in the cases reported by Evaldson *et al* (1982), *Str. haemolyticus Gr. B* was the commonest organism isolated. This fact has also been stated by Vohra and Jain.

Culture of nasopharyngeal swabs of newborns yielded 3 positive cases—one for beta haemolytic streptococcus and 2 for *Klebsiella*. All these three babies developed RDS and died in the early neonatal period. None of the controls had this finding.

The frequency of inflammatory changes in decidua, foetal membranes, placenta and cord are indicated in Table V and Figs. 1 and 2.

The difference in inflammatory changes of the placenta membranes and decidua between study and controls was statistically significant ( $p < .001$ ). Malkani (1971) found inflammatory changes in 64.3% of placentae in cases of PROM and in 26.0% of controls. Kishore *et al* (1977) observed changes comparable to present study.

#### Perinatal Mortality

In the study group, there were 9 perinatal deaths, giving an incidence of 11.5%.

TABLE V  
Inflammatory Changes

Tissue	Reaction	Study Gr. N=78		Controls N=25	
		No.	%	No.	%
Decidua	Inflamed	51	65.3	9	36.0
	Normal	27	34.7	16	64.0
Membranes	Inflamed	33	42.3	6	24.0
	Normal	45	57.7	19	76.0
Placenta	Inflamed	32	41.0	6	24.0
	Normal	46	59.0	19	76.0
Cord	Inflamed	20	25.6	3	12.0
	Normal	58	74.4	22	88.0

The commonest cause was Respiratory Distress Syndrome, 66.6% (6/9).

Burla for his kind prission to use the hospital records for preparation of this paper.

Summary and Conclusion

In this controlled prospective study, amniotic fluid infection following premature rupture of membranes occurred in 46.1%. E. coli being the commonest pathogen. There was definite increase in maternal morbidity and perinatal mortality was high (11.5%). These ill effects were directly related to the latent period between membrane rupture and onset of labour. It is contended that these cases should be promptly treated with antibiotics and labour induced early.

Acknowledgements

The authors are grateful to the Superintendent, VSS Medical College Hospital,

References

1. Evaldson, G. R., Malmberg, A. S. and Nord, C. E.: Brit. J. Obstet. Gynec., 89(10): 793, 1982.
2. Gupta, P. L. and Gupta, P.: J. Obstet. Gynec. India, 27: 315, 1977.
3. Kishore, N., Lahiri, V. L., Sarkar, B., Chopra, N. and Nagrath, A.: J. Obstet. Gynec. India, 27: 542, 1977.
4. Malkani, P. K. and Bhasin, K.: J. Obstet. Gynec. India, 20: 340, 1971.
5. Miller, J. M.: Am. J. Obstet. Gynec., 136: 796, 1980.
6. Vohra, S. and Jain, S.: P.G. Obstet. Gynec., Ed. by M. K. Krishna Menon, 2nd Ed. 1984, p. 184.
7. Santosh, Damayanti, Verma, U., Sabh rawal, U. and Harjeet: J. Obstet. Gynec. India, 34: 615, 1984.

TABLE V  
Following Cases

Case No.	Age	Parity	Duration of Labour	Mode of Delivery	Weight of Baby (kg)	Weight of Placenta (kg)	Weight of Membranes (kg)	Weight of Cord (kg)	Weight of Amnion (kg)	Weight of Fetus (kg)	Weight of Placenta + Membranes + Cord (kg)	Weight of Fetus + Placenta + Membranes + Cord (kg)
1	28	0	12	Normal	3.5	0.5	0.2	0.8	0.1	3.6	1.5	5.1
2	29	1	10	Normal	3.2	0.4	0.1	0.7	0.1	3.4	1.4	4.8
3	27	0	15	Normal	3.8	0.6	0.3	0.9	0.2	4.0	1.8	5.8
4	26	1	11	Normal	3.1	0.4	0.1	0.7	0.1	3.3	1.4	4.7
5	28	0	13	Normal	3.6	0.5	0.2	0.8	0.1	3.7	1.6	5.3
6	29	1	10	Normal	3.3	0.4	0.1	0.7	0.1	3.5	1.5	5.0
7	27	0	14	Normal	3.7	0.5	0.2	0.8	0.1	3.8	1.7	5.5
8	28	1	11	Normal	3.4	0.4	0.1	0.7	0.1	3.6	1.5	5.1
9	29	0	12	Normal	3.5	0.5	0.2	0.8	0.1	3.7	1.6	5.3