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To study the incidence of premature rupture of membranes and to find the effect of it on prenatal and maternal morbidity and mortality

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Abstract

Background: Premature rupture of membranes (PROM) is a common and important event in obstetrics. One of the most challenging situations, the obstetrician encounter is the management of a patient with PROM. Indeed, no single entity in obstetric practice is so surfeited with divergent views regarding its causation and management.

Objectives: To study the incidence of premature rupture of membranes and to find the effect of it on prenatal and maternal morbidity and mortality.

Methods: A total of hundred patients who were diagnosed to have spontaneous premature rupture of membranes (PROM) and admitted in the Shadan Institute of Medical Sciences, Hyderabad were studied. A detailed history was taken of all these patients. All patients were examined including general examination, systemic examination, abdominal examination for foetal position and presentation, speculum and digital prevaginal examination.

Results: Out of 1220 patients during the study period 100 cases had premature rupture of membranes with the incidence of 12.2% in this hospital. Overall incidence of amnionitis in PROM is 19%. The overall incidence of postpartum morbidity in PROM was 5%. Overall perinatal mortality in PROM is 15% overall perinatal mortality in the total no. of deliveries is 7.6%. Out of 100 cases studied 20 cases were premature babies. 65% of these perinatal deaths were amongst premature while 35% in mature infants.

Conclusion: The duration of latent period was directly related to the development of amnionitis, maternal morbidity and perinatal morbidity and mortality.

Keywords: PROM, mortality, morbidity, amnionitis

Introduction

Premature rupture of membranes (PROM) is a common and important event in obstetrics. One of the most challenging situations, the obstetrician encounter is the management of a patient with PROM. Indeed, no single entity in obstetric practice is so surfeited with divergent views regarding its causation and management ^[1].

In the majority of the cases, PROM poses no serious problems. Due to the fact that it occurs at or near term, more often the presenting part engages and labour ensues shortly, progresses efficiently and associated complications are relatively uncommon. However, when PROM is associated with premature gestation and/or a prolonged latent period, there is an increased possibility of fetal death due to prematurity per se and/or the development of amnionitis ^[2].

With intact fetal membranes, fetus enjoys a large measure of isolation and protection from microorganisms of its surrounding environment, and hence possible etiological factors need to be evaluated which deprive the fetus of its benefit. When PROM occurs in the course of a pregnancy, both maternal and fetal welfare are endangered. The serious threat is dependent upon several variables, the length of gestation, fetal weight, fetal presentation, the duration of the latent period, the development of amnionitis and most importantly, the management of the patient ^[3]. There exists a variation in opinion as to the risks involved in PROM, as well as the proper management of patients with the complication. Most plans of management appear to be based upon the personal experience.

There is a general agreement that the term and near term pregnant patient with ruptured membranes should be delivered to avoid infection of both mother and the infant. This dictum doesn't apply to gestation under 36 weeks ^[4]. The assumption which underlies this dichotomy is that prematurity is a greater hazard to the tiny infant than the risk of infection.

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Materials and Methods

Department and Sample size: A total of hundred patients who were diagnosed to have spontaneous premature rupture of membranes (PROM) and admitted in the Shadan Institute of medical Sciences, Hyderabad were studied.

Duration of study: 6 months

Inclusion Criteria

- 16 to 35 yrs patients
- PROM cases

Exclusion Criteria

- >35 yrs
- Not willing to give informed consent

Methodology: A detailed history was taken of all these patients, All patients were examined including general examination, systemic examination, abdominal examination for foetal position and presentation, speculum and digital prevaginal examination.

Sterile speculum examination without using any antiseptic was undertaken to reveal presence or absence of amniotic fluid leak through cervix with or without application of fundal pressure. A sterile digital examination was also undertaken to evaluate cervical effacement, dilatation consistency and presence or absence of cord prolapse.

The new born babies were examined for their apgar score at birth and presence of excessive moulding, caput, congenital anomalies their birth weight and temperature were recorded. The progress of the babies in the neonatal period and their ability to suck presence or absence of sepsis and temperature were noted.

Statistical Analysis: The SPSS 22 software was used to do statistical analysis and the outcomes were presented in the form of tables with incidence and percentages.

Observation and Results

Out of 1220 patients during the study period 100 cases had premature rupture of membranes with the incidence of 12.2% in this hospital.

Table 1: Distribution of cases based on Various parameters

Maternal age in years	No. of cases	Percentage
16-20	26	28%
21-25	40	40%
26-30	27	27%
31-35	07	07%
Gravida		
Primi	36	36%
2nd to 4th	58	58%
5 and more	06	06%
Pregnancy		
Singleton	99	99%
Twins	01	01%
Presentation		
Vertex	92	92%
Breech	6	6%
Face	2	2%
Gestational age		
28 – 34 weeks	16	16%
35 – 36 weeks	4	4%
37 – 40 weeks	80	80%
Type of leak		
High leak	12	12%
Low leak	88	88%
Management		
Conservative	01	1%
Active management of pregnancy	29	29%
Spontaneous onset of labour	70%	70%
Total	100	100%

The 21-25 years was the common age group as 40% of the patients were between these ages. While the age range varies from 16-35 years. Around 64% of the patients were multigravidae while 36% cases were primi gravidae. Around 99% of patients had singleton pregnancy while incidence of twins in PROM was 1%. It is also seen that overall

incidence of twins in the same period was 2% and singleton pregnancy was 98%.

Percentage of patients with term pregnancy in our series was 80% and with preterm pregnancy was 20%. Around 70% of the patients developed spontaneous onset of labour and pregnancy was terminated actively in 29% of cases.

Table 2: Mode of delivery

Type	Spontaneous vaginal delivery		Others		
	With oxytocin	Without oxytocin	Forceps	LSCS	Total
Spontaneous	12	10	12	36	70
Active	9	5	3	12	29
Conservative	-	1	-	-	1
Total	21%	16%	15%	48%	

Incidence in PROM	37%	-	15%	48%	
Incidence in General population	51.38%	-	12.69%	25.04%	

The incidence of LSCS in PROM as 48% while 52% of the patients delivered vaginally. The incidence of forceps delivery was 15%.

Table 3: Incidence and indications for LSCS in PROM, Latent period, Onset of leak

Indications	No. of cases	Percentage
Foetal distress	10	10%
Failure to progress	08	08%
Prematurity with unripe cervix	03	03%
Uterine inertia	03	03%
CPD	13	13%
Previous LSCS for recurrent cause	03	03%
FACE	02	02%
Breech	06	06%
Latent Period		
24 hours or less	93	93%
More than 24 hours	07	07%
Total duration of leak		
24 hours or less	91	91%
More than 24 hours	09	09%

Total incidence of caesarean section during the study period was 28.06%. Latent period of ≤ 24 was seen in 93% of the cases and in 7% of the cases >24 hrs latent period was seen. Total duration of leak was ≤ 24 was seen in 91% of the cases and in 9% of the cases >24 hrs leak duration was reported.

Table 4: Relation of al enionitis to latent period and postpartum morbidity to PROM

Relation of al enionitis to latent period	No. of cases with amnionitis	Percentage
24 hours or less	15	16.22%
More than 24 hours	04	57.14%
Total	19	
Relation of postpartum morbidity to PROM	Postpartum infection	
24 hours or less	02	2.15%
More than 24 hours	03	42.85%
Total	05	

Overall incidence of amnionitis in PROM is 19%. The overall incidence of postpartum morbidity in PROM was 5%.

Table 5: Relation of perinatal mortality to latent period.

No. of perinatal deaths	24 hours or less 10	More than 24 hours 5
Total births	91	09
Incidence	10.98%	55.55%

Overall perinatal mortality in PROM is 15% overall perinatal mortality in the total no. of deliveries is 7.6%.

Table 6: Analysis of perinatal deaths

Cases	No. of deaths premature / mature	Percentage
Infections	04	26.6%
Congenital 11 anomalies	01	06.6%
R.D.S.	05	33.3%
Intrauterine asphyxia	03/02	33.3%
Total	13/02	100%

Out of 100 cases studied 20 cases were premature babies. 65%

of these perinatal deaths were amongst premature while 35% in mature infants.

Table 7: Relation of birth weight to PROM

Birth weight in kgs—	No. of cases	Percentage
<2 kgs	15	15%
2.1 — 2.5 kgs	40	40%
2.6 — 3 kgs	32	32%
3.1 — 3.5 kgs	07	07%
3.6 — 4 kgs	05	05%
> 4 kgs	01	01%
Total	100	100%

Out of 100 cases studied 40% of neonates have birth weight 2.1 — 2.5 kgs 32% have been 2.6 — 3 kgs.

Discussion

Among the more perplexing problems of the specialty of Obstetrics & Gynaecology is the unabating incidence of premature rupture of the membranes. The seriousness of this threat is dependent upon several variables. The length of gestation, foetal weight, foetal presentation the duration of labour period^[5]. The development of amnionitis and most importantly the management of the patient there exists a difference of opinion as to the relative importance of these variables and to the proper degree of aggressiveness necessary to achieve optimum in foetal salvage.

The incidence of PROM in Shadan Institute of Medical Sciences, Hyderabad was 12.2% during the study period. This is quite comparable with the average incidence reported by various authors^[6].

The maternal age associated with spontaneous PROM in this study ranges from 16-35 years and 21-25 years was the common age group (40%). These findings correlate with those of previous studies who reported the age range was 16-41 and the men age was 25 years. Lower common age group in this study is probably due to earlier marriage and earlier pregnancies in our country^[7].

As per the parity 36 out of 100 patients (36%) were primigravidas and 64% were multigravidas. Of the multigravidas only 6 had more than 4 pregnancies. However previous studies have found no significant correlation of spontaneous PROM with maternal age and parity^[8,9].

The incidence of twin pregnancy in PROM in present study was 1% but the overall incidence of twin deliveries during the present study was 2%. the 99 cases of singleton pregnancy associated with PROM 92% presented with vertex and 8% and malpresentation (overall incidence of malpresentation was 6.8%). Among malpresentations in PROM. The incidence of breech was 6% but the overall incidence of breech was 4.31%. This shows significantly higher incidence of malpresentation in association with PROM. The increased incidence of breech presentation in PROM, has also noted by some of the other authors^[10,11].

The incidence of prematurity in PROM in the present study was 20% and overall incidence was 7.5%. This shows higher incidence of prematurity in associated with PROM and is comparable with those of other authors^[12].

Out of the 100 patients with spontaneous PROM studied 70% developed spontaneous onset of labour and in 29% where gestation was more than 36% completed weeks, pregnancy was

terminated actively either by oxytocin induction or by caesarean section even though the incidence of prematurity in the present study was 20% only one case where the pregnancy was 32 weeks continued for 8 days which also ended in spontaneous labour. In the 29 patients where gestation was more than 36 completed weeks pregnancy was terminated actively either with oxytocin or by caesarian section depending on the case [13].

Forty eight percent of the patients with PROM were delivered by caesarian section in the present study and 52% had vaginal delivery with or without oxytocin and / or forceps. The overall rate of caesarian section in general obstetric population during the study period was 25.04%. Therefore the incidence of caesarian section in PROM is significantly higher. The higher incidence of caesarian section. Delivery in the present series as compared to the reported range in literature of 1-22.7% (Breese, 1961; Ekawall *et al* 1961., Gunn 1970; Varner and Galask 1981 and Berkowitz *et al* 1982) is probably due to the fact that this center is one of the main referral hospital and therefore overall incidence of complicated labour is higher [14, 15, 16].

When latent periods were analyzed 7% of the patients had latent period of more than 24 hours while 93% with latent period less than 24 hours. Similarly interval between onset of leaking and time of delivery (Total duration of leak) was analyzed it was found that 9% of cases were associated with total duration of leak more than 24 hours while 91% with less than 24 hours.

Overall incidence of amionitis in PROM was 19% which showed histological changes of chorioamnionitis. Incidence of amnionitis with latent period less than 24 hours was 16.2% but when latent period exceeded 2 hours 57.14% of patients developed amnionitis. This confirms the finding that longer the latent period more is the incidence of amnionitis.

The incidence of postpartum maternal morbidity during the present study was 5% when attempt was made to correlate latent period to postpartum maternal morbidity it was found that longer the latent period. Higher was the postpartum morbidity as 3% of cases having latent period more than 24 hours had postpartum morbidity but when the latent period was 24 hours or less only 2% of patients had morbidity there was no maternal death due to PROM during present study.

The perinatal mortality in PROM in this study was 15% but the overall incidence for the total number of births during the study period was 7.6%. When perinatal deaths were analyzed according to latent period it is obvious that longer the period higher is the perinatal mortality.

The various causes for the perinatal deaths were analyzed it is found that 26.6% of the perinatal deaths were due to neonatal infections. Congenital anomalies incompatible with life were responsible for 6.6% of the perinatal deaths. Respiratory distress syndrome was responsible for 33.3% of the neonatal deaths all these babies were less than 32 weeks gestation when the data analyzed according to maturity 65% of these perinatal deaths occurred is prematures and 45% were in mature infants. In premature 87.7% were due to RDS. Thus RDS and neonatal infections were important causes of death is premature.

Where the data were analyzed according to birth weight 40% of the neonates have birth weight between 2.1-2.5 kgs and 32% of neonates have birth weight 2.6-3 kgs and only one baby. is more than 4 kgs. Of 15% of babies have birth weight less than 2 kgs. 12 were premature babies.

Conclusion

The duration of latent period was directly related to the development of amnionitis, maternal morbidity and perinatal morbidity and mortality. The overall incidence of amnionitis

was 19% and postpartum maternal morbidity was 5% when latent period was 24 hours or less amnionitis and maternal morbidity were present in 16.2% and 2.15% respectively. But when latent period exceeds 24 hours incidence of amnionitis and maternal morbidity increased. Out of 15% of perinatal mortality 65% occurred in premature and 35% were in mature infants. Those with latent period of 24 hours or less the perinatal mortality rate was 16.2% but when latent period exceeds 24 hours it sharply increased. Prematurity with its risk infection and RDS were responsible for 60% of perinatal deaths.

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