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STUDY OF CLINICAL: DEMOGRAPHIC PROFILE, MANAGEMENT & FOETAL OUTCOME AMONG PREGNANT WOMEN WITH PREMATURE RUPTURE OF MEMBRANE ATTENDING THE TERTARY CARE CENTRE, MAHARAHSTRA

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HOW TO CITE THIS ARTICLE:

Chetan A. Pawar. "Study of Clinical: Demographic Profile, Management & Foetal Outcome among Pregnant Women with Premature Rupture of Membrane attending the Tertiary Care Centre, Maharashtra". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 58, November 03; Page: 13126-13134, DOI: 10.14260/jemds/2014/3745

ABSTRACT: BACKGROUND: The Premature Rupture of Membrane (PROM) is one of the key factors in maternal and foetal prognosis. The management of premature rupture of membrane varies according to gestational age, duration of latent period, maternal and foetal well-being, and experienced obstetrician. The objective was to study the profile, management and foetal outcome among PROM cases. **METHODOLOGY:** The present study carried out at tertiary care Centre over the period of 6 months. PROM cases were included for study. Management of PROM cases was done as per institutional protocol. Duration of PROM, Vaginal swab, Mode of delivery, Birth weight, CBC & blood culture of newborn etc. collected from the records. All data collected and analyzed statistically. **RESULTS:** Total 100 cases were included. 56 % & 36 % pregnancies were multigravida and Preterm respectively. Leucorrhoea, fever, burning micturition were suspected risk factors among PROM cases. 97% of PROM with preterm pregnancy had spontaneous onset of labour. 100% went into spontaneous labour when cervical dilatation on admission was more than 3cm. 63.8% of Preterm with PROM cases went into spontaneous labour within 24 hrs. 59.3% of vaginal swab positive pregnant mothers had newborn with the sepsis. Poor APGAR score was 71.5% were from preterm PROM cases. low birth weight was observed among 49(48%) neonates, out of which 25(71.4%) were from preterm PROM cases. 30 (29.4%) cases having neonatal sepsis clinically, out of which 60% were full term PROM cases. 7 (6.8%) death occurred among the neonates, out of which 04(57.2%) were preterm PROM cases. **CONCLUSION:** The study concludes that the management of preterm PROM cases is very crucial. Neonatal out come in cases of premature rupture of membranes was mainly related to gestation age, total duration of premature rupture of membrane and mode of delivery. **KEYWORDS:** Management, Foetal Outcome, Premature Rupture of Membrane.

INTRODUCTION: The transcendent objective of obstetrics is that every pregnancy be wanted and that it culminates in a healthy mother and healthy baby. "Spontaneous rupture of membrane" is usual event taking place as a part of normal labour. Leaking membranes or premature rupture of membranes is "rupture of membranes before onset of labour". The interval between onset of leaking and onset of labour is called as "latent period". This period is one of the key factors in maternal and foetal prognosis in cases of premature rupture of membrane.

Criteria for absence of contractions for one hour of observation after admission in leaking patients was used by Grant et al in 1992. The incidence of premature rupture of membrane (PROM) is 20 % at term.¹ The accuracy of diagnosis of rupture of membranes is another variable that affect the incidence of PROM. The management of premature rupture of membrane varies according to gestational age, duration of latent period, maternal and foetal well-being, and availability of different

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obstetric and neonatal facilities and personal experiences of the obstetrician. Hence the present study carried out for clinical profile, management and foetal outcome among pregnant women with premature rupture of membrane.

METHODOLOGY: The present prospective descriptive study carried out in the department of obstetrics and gynecology at tertiary care Centre. Premature rupture of membrane (PROM) is defined as patient attending labor ward with history of leaking membranes before onset of labor pains. The pregnant women with gestation >28 weeks, presence of per vaginal(PV) leaking, no history of Lower Segment Caesarian Section (LSCS), no associated major medical or surgical illness or pregnancy induced illness & presence of confirm rupture membrane were included for study purpose.

Those who < 28 weeks, absence of leaking PV, previous LSCS, and presence of major medical disorder or pregnancy induced illness & absence of confirm rupture membrane were excluded from the study. Institutional Ethical Committee approval was taken prior to conducting the study. All patients attending the labour room as per the selection criteria were included for the study during the period of February to July 2003.

Per speculum examination was done to confirm the rupture of membranes. Per vaginal examination was done to note cervical dilatation. Latent period i.e. the interval between onset of leaking and onset of labour was also noted. Variable like detailed history of factors known for predisposing the premature rupture of membrane were collected from the study participants. Gestational age of the foetus, presentation, lie and attitude of the foetus were noted. Vaginal swab (for gram stain and culture of organism) & Complete Blood Count (CBC) collected to prove presence of infection.

All the study participants were managed as per institutional management protocol which includes patients with full term PROM and already in labour were allowed to progress with careful maternal and foetal monitoring. Patients with full term PROM with presence of fever in mother or maternal CBC suggestive of sepsis and not in labor were considered for induction of labour with intravenous pitocin. Augmentation of labor was done in patients who were already in labour but with unsatisfactory progress of labour.

Patients with Preterm PROM were managed conservatively with antibiotics, tocolytics and corticosteroids (2 doses of dexamethasone 12 mg I.M. at 12 hrs duration). Complete bed rest, head low position, sterile vaginal pads were given to all these patients and maternal, foetal well-being was monitored. All the deliveries attended by neonatologist. Mode of delivery of the baby, Presentation of baby, birth weight, Apgar score at birth was noted. CBC, blood culture & Chest X-ray were carried out for new born babies.

Babies were transferred to NICU as per the condition of baby as well as asymptomatic babies with history of latent period > 12 hrs duration. Perinatal mortality includes stillbirth, death of new borne during delivery or within 7 days of delivery. The data were entered, cleaned and analyzed in Microsoft™ Excel® 2007. Frequency distributions showing number and percentages were generated for each identified variables. Chi square and fisher exact test of significance applied.

RESULTS: Total 1072 patients delivered during the study period in our hospital, out of which 100 cases having PROM were studied.

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Table 1 shows clinical-demographic profile of the PROM cases. Age wise distribution shows maximum cases (57%) between age group 21-25, followed by 26- 30 age group (27%). 56 % & 44% cases were multigravida and primigravida respectively. 64% Term pregnancies observed as compared to 36% preterm pregnancies. 98 pregnancies were singleton while 2 pregnancies had twins. Graph 1 shows suspected risk factors among PROM cases which include h/o leucorrhoea or vaginal discharge (14%), fever (11%), burning micturition (6%) and recent intercourse (6%) among the study participants.

Table 2 shows the cervical dilatation and mode of delivery among PROM with preterm and full term cases during study period. Out of 64 patients of full term PROM, at cervical dilatation 0-1cm, 1-3cm & > 3 cm, 7 out of 13 i.e 53.8%, 32 out of 40 i.e. 80% & 11 out of 11 i.e.100% went into spontaneous onset of labour respectively. At cervical dilatation 0-1cm & 1-3 cm, four cases out of 13 i.e.30.8% & five out of 40 i.e. 12.5% required induction of labour. Out of nine case of induced labour, five delivered vaginally (77.7%), one required forceps (14.3%) & one required Emergency Caesarian Section (14.3%) for non-progress of labour with foetal distress. At cervical dilatation 0-1 and 1-3 cm, 2 out of 13 cases i.e.15.4% and three out of 40 cases i.e. 7.5% required emergency LSCS before going into labour.

The indications for LSCS were thick meconium stained liquor (20%), primigravida with breech (40%), Contracted pelvis (20%), foetal distress (20%). Overall 14 patients out of 64 i.e. 21.8% full term PROM cases required caesarian section. Out of 36 patients of PROM with preterm pregnancy, at cervical dilatation 0-1cm,1-3 cm,3-6 cm and >6 -10 cm, one out of one (100%), 21 out of 22 (95.4%),12 out of 12 (100%) and one out of one (100%) had spontaneous onset of labour respectively. At cervical dilatation of 1-3 cm, 1 out of 22 i.e., 4.5% cases has induction of labour.

Table 3 shows distribution according to duration of latent period in spontaneous labour among PROM with preterm and full term cases during study period.47 out of 64 i.e.74% of full term pregnancy with PROM had spontaneous onset of labour within 24 hrs. While 4 out of 13 i.e.30% of 28-32 weeks gestation with PROM went into spontaneous labour within 24 hrs.

Out of 32 vaginal swab positive for bacteria, 19 (59.3%) babies having sepsis as compared to only 10 (14.7%) babies having sepsis out of 68 vaginal swab negative for bacteria. ($X^2=21.08$, $df=1$, $P<0.0001$, Statistically significant). Table 4 shows the foetal outcome among the delivered Full term and pre term PROM cases. Total 102 babies delivered as two mothers delivered twins. 11 neonates having breech presentation out of which 55% were from preterm PROM mothers.

Poor APGAR score (6.8%) was observed, out of which 71.5% were from preterm PROM cases. low birth weight was observed among 49(48%) neonates, out of which 25(71.4%)were from preterm PROM cases. 30 (29.4%) cases having neonatal sepsis clinically, out of which 60% were full term PROM cases. CBC suggestive infection (), 10(33.3%) Blood culture positive and 10(33.3%) had Chest X ray positive for infection. 7 (6.8%) death occurred among the neonates, out of which 04(57.2%) were pre term PROM cases.

DISCUSSION: Total 100 cases of premature rupture of membranes were observed during the study period i.e. form Feb 2003 to July 2003. The incidence of premature rupture of membrane was found out to be10.7%. This finding similar with the incidence of 2-18 % & 6-7% observed by Gunn GC et al ¹ & T aylor ES el al² respectively. The higher percentage of cases (88%) between age group 21-30 years is because this is the period where child bearing is most likely to occur.

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Our study showed that PROM was more in multigravida (54%) than primigravida (44%) cases. Recent Studies have shown relationship between parity and membrane thickness. With the increasing parity, the membrane thickness reduces therefore the membrane thickness measurement on ultrasonography may help in diagnosis and prediction of premature rupture of membranes.³

In present study, 64 % were beyond 37 weeks of gestation. Daikoku and Johnson⁴ also observed almost 70% of cases of PROM occurred at term. Our institution being a tertiary centre, the incidence of preterm PROM was high i.e.36%. However, incidence of preterm PROM may be higher in referral centers. This may be as high as 35-50% at referral center according to study done by Kappy et al.⁵

History of Leucorrhoea and vaginal discharge (14%) was the most common risk factor followed by burning micturition or fever (11%), recent vaginal examination (10%) and recent sexual intercourse (6%) found during the present study. Herger et al⁶ also studied the similar risk factors for PROM. Mink off et al found that there is significantly increased in the incidence of PROM in patients with Trichomonas vaginitis and Staphylococcal infection. Bacteria in vagina produce proteases which reduce the strength of membrane.⁷

30 % of vaginal swab showed presence of organisms among PROM cases. The commonest organism found was E.coli. 57% of babies having neonatal sepsis were associated with presence of organism in vaginal swab among study cases. This shows increase chance of infection to the newborn. Kundan Rao and Nandan Singh also studied similar findings along with the E coli as most common organism causing infection.⁸

At cervical dilatation of 0-1cm, 7 (53.8%) out of 13, cervical dilatation of 1-3 cms 32(80%) patients out of 40 & at cervical dilatation of more than 3 cms, all 11 patients i.e.100% went into spontaneous onset of labour. This findings explains that cervical dilatation on admission goes on increasing the chances of going into spontaneous labour increase. 47 (73.43%) out of 64 patients of term PROM had spontaneous onset of labour within 24 hours.

Among the full term PROM cases, 9.3% having delivery through caesarian section with indications like breech presentation, foetal distress, Thick meconium stained liquor, non-progressive labour with foetal distress. Russel and Anderson suggested that using cesarean section to ensure the termination of pregnancy within 24 hrs of rupture of membrane, raised the rate of caesarian section from 4.5 % to 12 % but reduced the 2.3rd foetal death.⁹ Kappy et al⁵ also studied the similar findings.

In present study, 35 (97%) cases were delivered spontaneous labour among pre term PROM cases. 23 (63.88%) cases went into spontaneous labour within 24 hrs. The attempts were made to conserve the pregnancy at least for 24 hours till the corticosteroid treatment given to mother would improve the surfactant function in the premature foetus and decrease the incidence of respiratory distress syndrome in foetus.

This was combined with the tocolytic to prevent the uterine contractions and thus the further progress of labour. Out of 36 patients of preterm pregnancy with PROM, only 13 (37%) patients could be conserved for duration of more than 24 hrs i.e., the period required for action of dexamethasone in improving foetal maturity. Morrison et al¹⁰ studied the effect of maternal glucocorticoids in patients with pre term PROM and found marked reduction in incidence of respiratory distress syndrome (RDS) in the infants over 32 weeks of gestation.

The duration of latent period was more in patients of preterm PROM than the full term PROM which was due to tocolytic therapy given to patients with preterm PROM. According to Kappy et al⁵

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most of the patients with PROM go in spontaneous labour if left alone. Only 20% will not do so within 24hrs. 3% remain undelivered after 7 days.

In the present study, 11% having breech presentation which is more dangerous in case of PROM since there is increased incidence of cord prolapsed. Out of 49% low birth weight babies, 35 (71.4%) mothers having pre term PROM shows cessation of weight gain specially during last weeks of pregnancy.

Poor APGAR score was among 7 (6.8%) cases during the study period. 71.5 % of poor APGAR cases were from Pre term PROM pregnant mothers. The total duration of PROM ranged from 12 hours to 48 hours among all poor APGAR cases. Burchell¹¹ observed more incidence than present study. This low incidence could be due to good antenatal care, proper intrapartum monitoring, prophylactic antibiotic given to mother, aseptic precaution in the labour ward etc. 45 (54.2%) newborn of mothers having Full term PROM were admitted in NICU as compared to (45.8%) newborn of Pre term PROM cases.

The percentage more among the Full term may be because relaxed the criteria of NICU admission. Although many babies were admitted in NICU, those babies who did not show any clinical evidence of infection or investigations suggestive of no sepsis in babies were transferred to postnatal ward as early as possible i.e. mostly within 24hrs, if they are asymptomatic. Out of 30 (29.4%) cases of neonatal sepsis clinically, 18 (60%) neonate were of full term PROM pregnant mother cases.

19 (63.3%) CBC shows infection, 10 (33.3%) shows blood culture positive and 10 (33.3%) chest X ray suggestive of infection. However, some of the recent studies done by Malik AS in 1994 advocate that incidence of neonatal morbidity associated with PROM is low hence neonates with this problem alone need not be admitted in neonatal nursery.¹²

Wolf RL and Olinaky observed that PROM of 24 hrs or longer is associated with increased incidence of amniotitis. Longer the rupture before term, greater is the degree of prematurity, greater is the risk involved. The assumption to be made is approximately 4-5% of the babies are infected. He had advised to start antibiotic therapy prophylactically for the protection of foetus from infection¹³. The study concludes that the total duration of premature rupture of membrane increases the chances of infection and evidence of sepsis in babies.

The neonatal outcome in cases of premature rupture of membranes was mainly related to gestation age i.e. Full term or Pre term, mode of delivery & presence of maternal infection. The greater the cervical dilatation the lesser was the incidence of induction of labour in full term cases with premature rupture of membrane. Prematurity, infection, congenital anomalies were the causes of perinatal mortality in cases of PROM. Special care should be provided to the preterm PROM cases. Further studies required to compare the PROM cases with the Controls to study in depth about the foetal outcome.

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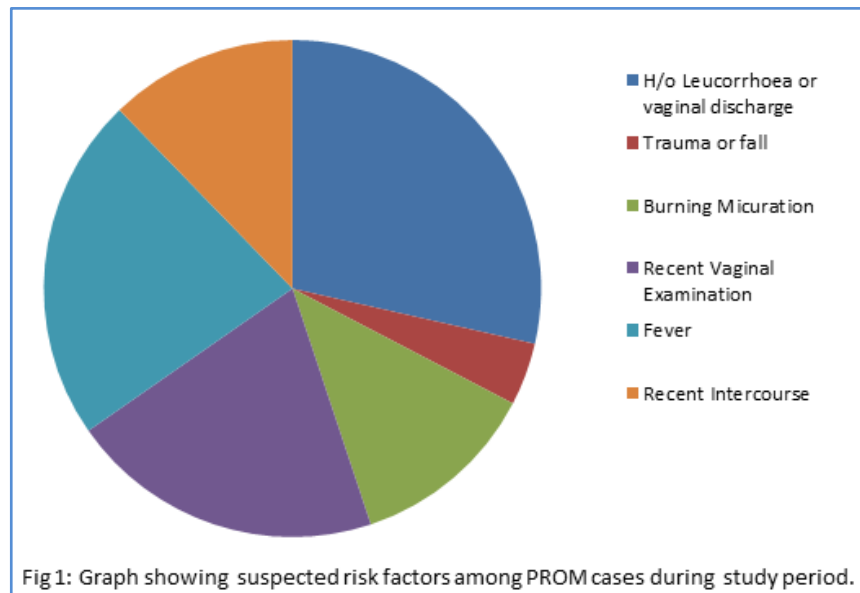
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| Variables | | Numbers (Percentage) |
|----------------------|-----------------------------|-------------------------|
| Age Group | 15-20 | 10 (10) |
| | 21-25 | 57 (57) |
| | 26-30 | 31 (31) |
| | >30 | 02 (02) |
| Education Status | Illiterate | 04 (04) |
| | Upto Primary level | 24(24) |
| | Upto secondary level | 20 (28) |
| | Upto Higher secondary level | 27 (27) |
| | Upto graduation | 17 (17) |
| | Upto Post-graduation | 08 (08) |
| Occupation | Housewife | 60 (60) |
| | Labourer | 18 (18) |
| | Skilled worker | 14 (14) |
| | Professional | 08 (08) |
| Per Capita Income | < 1500 | 28 (38) |
| | >1501-2000 | 27 (27) |
| | >2001-2500 | 20 (25) |
| | >2501 | 25 (10) |
| Gravida Status | Primigravida | 44 (44) |
| | Multigravida | 56 (56) |

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| | | |
|---------------|-----------|---------|
| Gestation Age | Pre Term | 36 (36) |
| | Full Term | 64 (64) |
| No of Foetus | Single | 98 (98) |
| | Twins | 02 (02) |

Table1: Clinical-demographic profile of pregnant mothers with PROM during the study period



| Cervical Dilatation | PROM with Full term | | | | PROM with Preterm | | | |
|---------------------|---|--------------------------------|---------------------------------------|-----------|---|--------------------|-----------------------------|-----------|
| | Spontaneous Vaginal Delivery Number (%) | Induction of labour Number (%) | Emergency Cesarean Section Number (%) | Total | Spontaneous Vaginal Delivery Number (%) | Induced Number (%) | Cesarean Section Number (%) | Total |
| 0-1 | 07(53.8) | 04(30.8) | 02(15.4) | 13 | 01(100) | 0(0) | 0(0) | 01 |
| 1-3 | 32 (80) | 05(12.5) | 03(7.5) | 40 | 21(95.4) | 01(4.6) | 0(0) | 22 |
| 3-6 | 11(100) | 0(0) | 00(0) | 11 | 12(100) | 0(0) | 0(0) | 12 |
| 6-10 | 0(0) | 0(0) | 0(0) | 0 | 01(100) | 0 (0) | 0(0) | 01 |
| Total | 50(78.1) | 09(14.1) | 05(7.8) | 64 | 35(97.2) | 01(2.8) | 0(0) | 36 |

Table 2: Cervical dilatation and mode of delivery among PROM with preterm and full term cases during study period

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| Duration of Latent Period (Hrs) | Spontaneous Labour in PROM Term pregnancy No (%) | Spontaneous Labour in PROM Preterm Pregnancy | | |
|---------------------------------|--|--|-----------|---------------|
| | | 28-32 wks | 32-36 wks | Total NO. (%) |
| 0-6 | 23 (46) | 02 | 08 | 10 (28.6) |
| 6-12 | 16 (32) | 02 | 07 | 09 (25.8) |
| 12-24 | 08 (16) | 00 | 03 | 03 (8.6) |
| 24-48 | 01 (02) | 07 | 01 | 08 (22.8) |
| >48 | 02 (04) | 02 | 03 | 05 (14.2) |
| Total | 50 | 13 | 22 | 35 |

Table 3: Distribution according to duration of latent period in spontaneous labour among PROM with preterm and full term cases during study period

| Sr. No. | Variables | Full term PROM Number (%) | Pre term PROM Number (%) | P value |
|---------|---------------------------------------|---------------------------|--------------------------|---------------|
| 1 | Presentation Cephalic Breech | 59 (66.3) 05 (45.0) | 32 (33.7) 06 (55.0) | 0.321 (NS) |
| 2 | APGAR score Normal Poor | 62 (66.7) 02 (28.5) | 33 (33.3) 05 (71.5) | 0.098 (NS) |
| 3 | Birth Weight (gms) >2500 <2500 | 50 (94.3) 14 (28.6) | 03 (05.7) 35 (71.4) | 0.001 (S) |
| 4 | Baby admission NICU PNC | 45 (54.2) 19 (100.0) | 38 (45.8) 00 (00.0) | 0.001 (S) |
| 5 | Clinically sepsis Yes No | 18 (60.0) 46 (63.9) | 12 (30.0) 26 (36.1) | 0.137 (NS) |
| 6 | Complete Blood Count Raised Normal | 14 (73.7) 50 (59.5) | 05 (26.3) 33 (40.5) | 0.307 (NS) |
| 7 | Blood culture Positive Negative | 07 (70.0) 57 (62.0) | 03 (30.0) 35 (38.0) | 0.740 (NS) |
| 8 | X ray chest Positive Negative | 08 (80.0) 56 (60.9) | 02 (20.0) 36 (39.1) | 0.314 (NS) |
| 9 | Perinatal Output Death Alive | 03 (42.8) 61 (64.2) | 04 (57.2) 34 (35.8) | 0.419 (NS) |

Table 4: Feotal outcome among the Full term and Pre term PROM cases during the study period

S= Significant NS=Non-Significant

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Date of Submission: 17/10/2014.
Date of Peer Review: 18/10/2014.
Date of Acceptance: 29/10/2014.
Date of Publishing: 31/10/2014.