



DETERMINE THE EFFICACY OF ANTIBIOTIC THERAPY IN PROLONGING PREGNANCY BY PREVENTING DEVELOPMENT OF INFECTION

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ABSTRACT

Introduction: Preterm premature rupture of membranes is the rupture of membranes before 37 weeks of gestation. It occurs in 3 % of pregnancies and is the cause of approximately 1/3rd of all preterm deliveries. There are certain maternal and fetal complications associated with preterm premature rupture of membranes (PPROM).

Objective: The objective of this study is to determine the efficacy of antibiotic therapy in prolonging pregnancy by preventing development of infection.

Methodology: This Descriptive case series study was conducted at District Head Quarter Hospital, Mianwali during 1st June 2019 to 31st December 2019. 100 patients with preterm premature rupture of membranes were added.

Results: During the period of this study a total of 1800 deliveries occurred out of which 118 patients presented with PPRM making prevalence of 6.6%. Out of these 100 patients who met the inclusion criteria were enrolled in the study. Ages of patients ranged between 20 to 40 years with a mean age of 27 years.

Conclusion: It was concluded from this study that conservative management of patients with PPRM with strict antenatal fetal surveillance helps in prolonging pregnancy by increasing the latency period. In this way helps in improving the neonatal outcome and decrease the burden of prematurity on NICU.

Keywords: Antibiotic Therapy, Infection, Prolonging Pregnancy

INTRODUCTION

Preterm premature rupture of membranes is the rupture of membranes before 37 weeks of gestation. It occurs in 3 % of pregnancies and is the cause of approximately 1/3rd of all preterm deliveries (1). There are certain maternal and fetal complications associated with preterm premature rupture of membranes (PPROM). These are low Apgar score (30.5%), RDS (20%), PTL (30 to 40%). Maternal complications include placental abruption (4-12%), chorioamnionitis (13-16%) and endometritis

(16.47%) (2, 3). PPRM is an important cause of preterm birth resulting in large number of babies with low birth weight requiring intensive care (30.5%). It is associated with the increased fetal morbidity and mortality (3). The purpose of prophylactic antibiotics is to both prevent perinatal infections and to prolong the latency period and hence improve the outcome, as neonatal mortality decreases with increasing gestation i.e. 8% at 28 weeks and 2% at 32 weeks (4). Use of antibiotics can delay the delivery by at least seven days in 63.3% of patients (5). The risk of neonatal infections was 4.4% in babies with maternal history of antibiotics use while it was 11% in babies whose mothers didn't take antibiotics (6). Penicillin and erythromycin are associated with similar benefits. Amoxicillin / clavulanate should be avoided because of increased risk of necrotizing enterocolitis (5, 6). A conservative approach to the management of stable patients with antibiotics can decrease perinatal morbidity and mortality.

Premature rupture of membranes is the rupture of fetal membranes before the onset of labor. Rupture of fetal membranes before 37 completed weeks of gestation is known as preterm premature rupture of membranes PPRM. PPRM occurs in about 3% of pregnancies, and is responsible for about 1/3 of all preterm births, incidence in twin pregnancies is 7 to 20 % (7). As ppprom increases the risk of prematurity therefore it leads to a number of perinatal and neonatal complications including 1 to 2 percent risk of fetal death and 18 to 20 percent risk of perinatal deaths (8-16). The histological studies of the site of membranes rupture showed that there was a zone of altered morphology which was characterized by thickening of connective tissue of the membranes, thinning of cytotrophoblast layer and deciduas and disruption of the connections between amnion and chorion at a cellular level. These changes resulted from the release of phospholipases, eicosonoids (esp.PGE2), cytokines, elastases, matrix metalloproteinase and other proteases in response to a physiological or pathologic stimulus (9,10,17).

MATERIAL AND METHODS

This Descriptive case series study was conducted at District Head Quarter Hospital, Mianwali during 1st June 2019 to 31st December 2019. 100 patients with preterm premature rupture of membranes were added. Non-probability, purposive sampling

Inclusion Criteria

- Age 20 to 40 years
- All parities and gestational age between 28 to 36 weeks (on dating scan).
- Confirmed preterm premature rupture of membranes (sterile speculum examination)

Exclusion Criteria

- Abruptio placenta (USG)
- Intrauterine death (confirmed on USG)
- Eclampsia /Preeclampsia (history and clinical assessment)
- Patients with chronic diseases like diabetes mellitus or heart diseases (previous record /antenatal record)
- Fetus with congenital anomaly (confirmed on USG)
- Patient with labor pains (history and examination)
- Signs of chorioamnionitis (fever, tachycardia, pussy discharge, raised TLC, DLC)
- Fetal distress (CTG)

Data Collection

Patients who fulfilled the inclusion criteria presenting through emergency, OPD, or ward were included in the study after taking an informed consent. Detailed history and examination was done. PPRM was confirmed by sterile per speculum examination. In addition to baseline investigations specific investigations included TLC, DLC, HVS, MSU, USG for amount of liquor and biophysical profile. Antibiotics were given and conservative management was started. Inj. Ampicillin 1 gm. 6hrly was administered for 48 hours followed by oral antibiotics. Capsule Ampicillin 500mg QID or Tab.

Erythromycin 250 mg QID for 7 days. To enhance the fetal lung maturity Dexamethasone 12mg. I/M, two doses, 12 hrs apart was given as per Departmental protocol. Patients were kept admitted in ward. They were provided with sterile pads to see the color of liquor and per abdominal examination for uterine tenderness was done daily. Pulse and temperature were recorded four hourly and TLC, DLC were done on alternate days. Ultrasonography and biophysical profile were done twice weekly. Patients were followed for seven days after the start of antibiotics. Efficacy was determined if pregnancy was prolonged for 7 days without development of infection. All this information was entered in a pre-designed Performa (attached).

Data Analysis

All the information was entered into SPSS version 10.0 and data was analyzed through its statistical program. Age was presented as mean \pm SD. Efficacy of antibiotics in conservative management of PPRM was presented in terms of frequency and percentage.

RESULTS

A total of 1800 patients delivered from 1st June 2019 to 31st December 2019. Total numbers of patients with PPRM were 118 leading to prevalence of 6.6 %. The population studied consisted of 100 patients of PPRM, who met the inclusion criteria. Ages of patients ranged between 20 to 40 years with a mean age of 27 years. The maximum numbers of patients 52% were between the ages of 20 to 25 years followed by 20% between 31 to 35 years. There were 18 patients between 26 to 30 years and 10 cases were between 36 to 40 years. Patients of all parities were included in the study. Maximum number of patients was primigravidas 46%. There were 29% multigravida and 25% were grand multigravida. Gestational age of patients who presented with PPRM included in the study ranged from 28 to 36 weeks. Maximum numbers of patients were between 31 to 33 weeks (40%). There were 24 patients between 28 to 30 weeks and 36 patients (36%) were between 34 to 36 weeks. There were 33 patients (33%) who had history of one, two or more preterm deliveries. While there were 67% patients who had no such history. 10% patients had one, 12% had two and 11% had more than two history of preterm deliveries. In this study 66% patients belonged to low socioeconomic status with monthly income less than Rs.10, 000 per month. There were 24 patients 24% which were found to be belonging to middle class with monthly income less than 15,000 and only 10 patients 10% which were from high class.

Table 01: Distribution of cases according to various factors

Factor	Category	No. of Patients	Percentage
Age Group	20-25 Years	52	52%
	26-30 Years	20	20%
	31-35 Years	18	18%
	36-40 Years	10	10%
Parity	Primigravidas	46	46%
	Multigravidas	29	29%
	Grand multi	25	25%
Gestational Age	28-30 weeks	24	24%
	31-33 weeks	40	40%
	34-36 weeks	36	36%
History of Preterm Labor	Nil	67	67%
	One	10	10%
	Two	12	12%
	More	11	11%
Socioeconomic Status	Low	66	66%
	Middle	24	24%
	High	10	10%
Maternal Education	Illiterate	49	49%

	Primary/Middle	41	41%
	High	10	10%
Mode of Delivery	SVD	80	80%
	Instrumental Delivery	03	03%
	Cesarean Section	17	17%

There were 41 patients (41%) who were educated up to primary or middle only while only 10 patients (10%) were educated more than primary or middle. According to mode of delivery patients were divided into three groups. 80 patients (80%) had normal vaginal delivery, 3 patients (3%) had instrumental delivery. In this study 17 patients (17%) underwent cesarean section. Distribution of cases according to latency period showed that 61 patients (61%) had latency period more than 7 days while 39 patients (39%) were delivered within 7 days. As 61 patients (61%) remain undelivered for greater than 7 days so efficacy of antibiotics in my study was found to be 61%.

Table 02: Latency period and efficacy of antibodies

Factor	Category	No. of Patients	Percentage
Latency Period	< 7 days	61	61%
	> 7 days	39	39%
Efficacy of Antibiotics	Effective	61	61%
	Not Effective	39	39%

DISCUSSION

The prevalence of PPRM (Preterm Premature Rupture of Membranes) in this study was 6.6%, which is notably higher compared to the rates reported in England (1%), the United States (1-2%), and Canada (2-3%). However, this prevalence is lower than the 9.6% reported in N.W.F.P but is closer to the 5.4% incidence found in a study conducted in Punjab by Tahir et al. The relatively higher incidence in Punjab and N.W.F.P can be attributed to factors such as lack of education, poverty, and poor nutritional status, which are common in developing countries like Pakistan. Conversely, the fewer incidences in developed countries are likely due to better health and education facilities and improved nutritional status. Furthermore, the absence of routine screening programs in these regions to detect and treat genitourinary infections during pregnancy may also contribute to the higher prevalence. PPRM is associated with several demographic variables. One significant factor is maternal age, with most cases (52%) in this study occurring in women below 25 years of age. This finding aligns with another study conducted in Punjab by Tahir et al., which reported that 74% of patients were below 25 years of age. Similarly, Noor et al. found an incidence of 58.5% in the age group of 15 to 25 years, which is close to the results of this study. Another important factor is parity. PPRM is more common in primigravidas, with an incidence of 46% in this study. This is comparable to the 42.3% incidence reported by Noor et al., the 34% reported by Adnan A et al. in Jordan, and the 41.1% reported by Yang LC. Additionally, PPRM is known to be associated with a previous history of preterm labor or PPRM. In this study, 33% of patients had a history of one, two, or more preterm deliveries. This incidence is higher than the 14.7% reported by Tahir et al. and the 14.3% reported by Charles P J et al., but it is comparable to the 30.6% reported by Noor S et al.

Socioeconomic status and maternal education also play crucial roles. This study found that 66% of patients belonged to low socioeconomic status and 49% were uneducated. According to Noor et al., 68.2% of patients belonged to low socioeconomic status and 22.3% were illiterate. In the study by Adnan et al., 45% of women were uneducated and 56% belonged to low socioeconomic status. Finally, gestational age is another important variable. In this study, the majority of patients were between 31-33 weeks of gestation. This result is consistent with a study conducted by Nir Melamed et al., in which 46% of patients were below 34 weeks of gestation. Similarly, Noor S et al. reported that the maximum number of patients (43.5%) were between 30-35 weeks of gestation. These findings underscore the complex interplay of demographic factors associated with PPRM and highlight the need for targeted interventions to address these issues in at-risk populations.

CONCLUSION

It was concluded from this study that conservative management of patients with PPROM, combined with strict antenatal fetal surveillance, is effective in prolonging pregnancy by increasing the latency period. This approach significantly improves neonatal outcomes and reduces the burden of prematurity on neonatal intensive care units (NICUs). By carefully monitoring and managing these patients, the study demonstrated that it is possible to extend the duration of pregnancy, thereby allowing for better fetal development and reducing the complications associated with premature births.

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