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Maternal and Perinatal Outcome of Preterm Premature Rupture of Membrane

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Abstract

Background; *preterm premature rupture of membrane is associated with significant risks of maternal and perinatal morbidity and mortality, therefore the suitable decision play an important role in the management of this complication aiming to decrease maternal and fetal risks.*

Objective; *to evaluate the prevalence and outcome of pregnancies complicated by preterm premature rupture of membrane in terms of maternal morbidity, perinatal morbidity and mortality.*

Methodology; *during the study period 78 patients who had prolonged preterm premature rupture of membrane more than 24 hours at 24 to 36 weeks of gestation and received medical care at Misurata Teaching Hospital.*

Results; *the prevalence was 1.2% and the mean gestational age at the onset of membrane rupture and delivery was 33.2 ± 2.9 weeks and 34.9 ± 2.7 weeks, respectively. Maternal morbidity included placental abruption, chorioamnionitis, and postpartum hemorrhage. The majority of the mothers were delivered vaginally while 25.6% delivered by Cesarean section, 21.4% of the neonates had neonatal sepsis.*

Conclusion; *expectant management is a favorable to achieve fetal maturity and improve perinatal outcome of preterm premature rupture of membrane as survival rate is significantly increased with gestational age at time of diagnosis and birth weight with.*

Key wards: *preterm premature rupture of membrane, latency period, maternal and fetal morbidity and mortality.*

Introduction

Preterm prelabour rupture of membranes (PPROM) is one of the major factors that correlated with adverse pregnancy outcome [1-5]. The fetal membranes serve as a barrier to ascending infection, once the membranes rupture, both the mother and fetus are at risk of infection and is recommended to terminate the pregnancy when the risk of ascending infection outweighs the risk of prematurity. It has also been proposed that amniotic fluid posse's certain bacteriostatic properties that protect against potential infections processes and that a decrease in amniotic fluid volume may impair the gravid women ability to struggle such infections[6]. It has been demonstrated that as many as 25-30% of women with PPROM have a higher incidence of positive amniotic fluid culture obtained by amniocentesis even when there is no clinical doubt for chorioamnionitis[7,8]. The main benefit of the conservative management is extending pregnancy which can decrease gestational age-related morbidity associated with prematurity, but the benefit must be balanced with the risks such as clinical chorioamnionitis [7-11].The most common complication of PPROM is intrauterine infection, which can lead to chorioamnionitis, metritis after delivery. Additionally; adverse perinatal complications such as neonatal sepsis, cord compression leading to fetal distress, cord prolapse during rupture of membranes and placental abruption [7,12]. Perinatal outcomes constitute prematurity, neonatal sepsis, respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH), and risk of fetal and neonatal death [13].A number of risk factors for spontaneous preterm PROM have been identified, and the pathophysiology appears to be multifactorial [1,14]. Choriodecidual infection or inflammation appears to play an important role in etiology of preterm PROM, with rupture of membranes being attributed to increasing physical stress that weakens it [1,2,14]. The improvements in neonatal care for extremely premature newborns had resulted in increased neonatal survival over recent years, but delivery before 32 weeks' gestation is still associated with a significant risk of neonatal morbidity and death. Several areas of controversies exist regarding the best medical management of PPROM, so the key question is whether immediate delivery preventing infection or whether expectant management aimed at prolonging pregnancy to obtain fetal maturation. The present study reviewed the incidence and outcome of pregnancies complicated by PPROM between 24 to 36 weeks of gestation, after expectant management in terms of maternal morbidity, perinatal morbidity and mortality.

Methodology

During the study period, from 1st Oct. 2004 to 31st Oct. 2005, there were 6431 deliveries of whom 78 patients who had prolonged PROM more than 24 hours at 24 to 36 weeks of gestation and received medical care at Misurata Central Hospital. These patients were identified retrospectively, all available informations were reviewed. They were admitted then received prophylactic antibiotics (including intravenous Augmentin in combination with

Flagyl for 5 days followed Eythromycin + oral flagyl for next 7 days), tocolytic therapy, maternal and fetal monitoring, as well as antenatal corticosteroids when indicated after excluding active labor, vaginal bleeding, intrauterine infection, or evidence of fetal compromise. U/S evaluation was performed to assess fetal gestational age, growth, presentation, anatomy, and the level of amniotic fluid. Pelvic examination using a sterile speculum was performed; also vaginal swabs for bacterial infection and maternal CRP clinical markers were taken. Digital examination was avoided unless the patient was committed to delivery. Latency refers to the interval between rupture of the membranes and the onset of labor. Perinatal outcome parameters were either fetal demise or neonatal condition at discharge from the hospital in relation to infectious complications in the neonatal period. The actual survival rate is analyzed in relation to gestational age at onset of rupture of membrane as well as to birth weight. Test of difference of proportion using Z-score test statistic at 5% level was used.

Results

Out of 6431total deliveries; 78 mothershad PPROM at gestational age of 24-36weeks during a period one year, giving a prevalence of 1.2%. Of the total reviewed cases; 28 (36%) of the patients were nulliparousas As seen in table (1). The mean maternal age is 29.2 ± 5.6 years, the peak age group (53.8%) is between 20 and 29 years and younger age group represented less than 3% (fig. 1). Among the 78 patients included in the study, the gestational age distribution at the onset of PPROM (*fig.* 2) ranged between 24 and 36 weeks, and more than three-fourths (78.2%) had a rupture membrane between 32 and 36 weeks of gestation. At the onset of membrane rupture and delivery was 33.2 ± 2.9 weeks and 34.9 ± 2.7 weeks respectively.

The latency from ruptured membrane to delivery ranged from 1 to 83 days with a mean of 13.1 days. Nearly half of the cases (51.3%) have latency period more than one week as in table (2). History of diabetes as a chronic illness was recorded in 3 mothers (3.8%) as seen in table (3); and none of the mothers included had history of drug intake except those treated for Diabetes Miletus. Maternal morbidity included abruptio placentae (5.1%), chorioamnionitis (3.8%), and postpartum hemorrhage (2.6%). The majority of the mothers (74.4%) were delivered vaginally while 25.6% delivered by Cesarean section.

Regarding the perinatal outcome; the mean neonatal birth weight was 2434.5 ± 683grams and 47.6% had birth weight ≥ 2500 grams. About two-thirds (63.1%) admitted to intensive neonatal care and 21.4% of the neonates had neonatal sepsis, the perinatal outcome associated with PPROM is listed in table (4). Survival rate is significantly increased with increasing birth weight of infants with PPROM as shown in table (5).

Table (1): Demographic characteristics of the patients with PPROM

Variables	Values
Mean maternal age	29.2 ± 5.6 years
Parity Nulliparae Para 1-4 Para ≥ 5	 36% 50% 14%
Mean gestational age at admission	33.2 ± 2.9 weeks
Mean gestational age at delivery	34.9 ± 2.7
Mean Neonatal weight	2434.5± 683

Fig. 1: Distribution of patients according to age

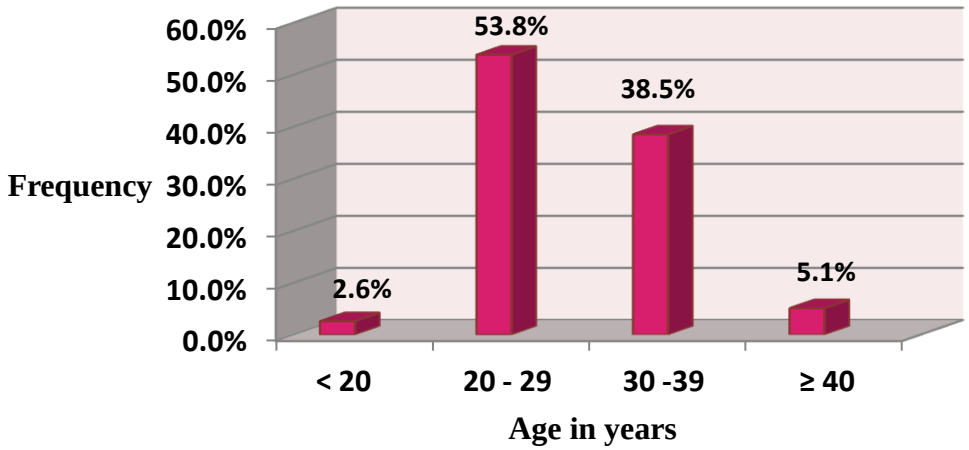

Fig. 2: Distribution of cases in relation to gestational age

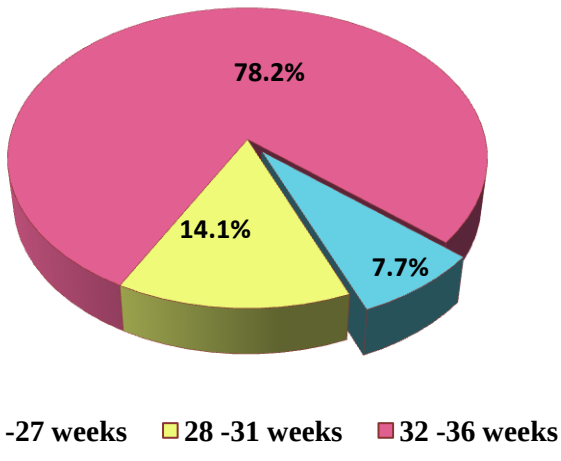

Table (2): Gestational age and latency period duration

Gestational age	24- 48 hours	48 hour- week	> week	Total
24 – 27	0	2	4	6(7.7%)
28 – 31	2	1	8	11(14.1%)
32 – 36	13	20	28	61(78.2%)
Total	15(19.2%)	23(29.5%)	40(51.3%)	78(100%)

Table (3): Maternal risk factors of PPROM

Maternal risk factor	No. of cases	Frequency
Multiple pregnancy	5	6.4%
Antepartum hemorrhage	4	5.1%
Infection (UTI, PID)	3	3.8%
Diabetes Mellitus	3	3.8%
Polyhydramnios	2	2.6%

Table (4): Perinatal outcome in PPROM

Parameter	No.	Frequency (%)
Stillbirth	5	6%
Born alive	79	94%
Congenital anomaly	3	3.6%
Low Apgar score	10	11.9%
Admitted to INCU	53	63.1%
Neonatal sepsis	18	21.4%
Respiratory distress	16	19%
Neonatal death	18	21.4%
Perinatal mortality	23	27.4%

Table (5): Perinatal outcome and birth weight in PPROM

Birth weight (grams)	Frequency (%)	Stillbirth	Neonataldeath	Survival
< 1500	11(13.1%)	1 (9.1%)	9 (81.8%)*	1 (9.1%)*
1500 - 2499	33(39.3%)	4 (12.1%)	8 (24.2%)	21 (63.6%)
≥ 2500	40(47.6%)	0	1 (2.5%)	39 (97.5%)
Total	84(100%)	5 (6 %)	18 (21. 4%)	61(72.6%)

*significant decrease with the other 2 groups

Discussion

Preterm premature rupture of the membranes complicates 3% of pregnancies. It is more likely to occur in populations of lower socioeconomic status, and complicates 25%-30% of preterm births [15, 16]. PPROM evaluation and management are important for improving neonatal outcomes; it remains an area for highlight in obstetrics as a great controversy regarding immediate delivery and expectant management [17–20]. Pregnancies with PROM occur less than 30 weeks of gestation are generally expectantly managed while management beyond 30 weeks is highly variable [18]. However Furman et al. [21] concluded that PPROM was not an independent risk factor for neonatal morbidity in preterm births and neonatal morbidity was affected mainly by prematurity itself, rather than by the occurrence of PPROM. Previous studies show that PPROM is associated with a 4-fold increase in perinatal mortality and a 3-fold increase in neonatal morbidity [22].

Prevalence of PPROM in current study (1.2%) is twofold higher than reported previously by Khashoggi [23] in Saudi Arabia, 0.6%, but is lower than (1.2% vs. 2.3%) reported by Smith et al. [24]. The mean latency period from PPROM to delivery was 13.1 days among all 78 patients analyzed, which is a longer period of time than reported previously by Yang et al. [25], which was 8.6 days. This relatively longer latency period can be explained in part by the lower number of stillbirths recorded in our study (6%). It was observed that the number of days gained until delivery is much greater if the amniotic fluid index is higher [26]. Approximately half of the pregnancies (51.3%) delivered later than week of PPROM, more recent studies have shown better prognosis with appropriate therapy and conservative management and have reported less than 40% delivering in a week and more than 30% continuing pregnant after 5 weeks[27].

The risk of infection is significant following PPROM, the prevalence of chorioamnionitis in our study (3.8%) is much lower than reported previously (37%) by Yang et al. [25]. Also other maternal morbidities were low giving positive maternal outcome which may be due to aggressive expectant management including prophylactic use of broad-spectrum antibiotics, close monitoring for placental abruption, infection, labour and a non-reassuring fetal status. It has been demonstrated an association between the

development of chorioamnionitis and a shorter latency in patients with PPROM [28]. Effective treatment depends on accurate diagnosis and gestational age because the potential complications change with gestational age. Additionally; one of the major etiological factors in the pathogenesis and subsequent morbidity associated with PPROM; is subclinical uterine infection. Antenatal antibiotics, together with corticosteroid therapies, have clear benefits and should be offered to all women without contraindications [26]. The Cesarean section rate (25.6%) is significantly increased among these pregnancies (P value is 0.029) as compared with the general population rate (16.2%).

Later gestational age at time of PPROM is associated with longer latency duration and associated with increased survival rate, however; Natali Aziz et al. found that latency duration was inversely associated with gestational age at time of PPROM [29]. The major factor of neonatal morbidity and mortality is gestational age at delivery which stresses the importance of conservative management when possible, so neonatal outcome is mainly affected by prematurity rather than by preterm premature rupture of membranes [30]. The increased neonatal morbidity associated with PPROM appears to be inversely related to gestational age. It is suggested that adjunctive antibiotic therapy to reduced gestational age-dependent and infectious infant morbidity. Schrag et al. [31] concluded that preterm and low birth weight is important sepsis risk factors. Increased risk of chorioamnionitis is related to increased time from PPROM to delivery. The neonatal mortality (21.4%) was 4 times higher than reported by Khashoggi, 5.5% [23]. In current study, survival rate is significantly increased with increasing birth weight which is correlated to gestational age of infants with PPROM. Also the outcome might be better after 32 weeks' gestation as long as no other complicating factor exists, such as congenital malformation or pulmonary hypoplasia. The frequency of respiratory distress syndrome in the neonate complicated with PPROM was 19% which is comparable with Sims's results, 17% [32].

Conclusion

Prolongation of pregnancy up to 32-36 weeks to achieve fetal maturity and improve perinatal outcome of PPROM by aggressive expectant management is a favorable option as survival rate is significantly increased with gestational age at time of diagnosis and birth weight with.

Recommendation

Implantation of protocols for expecting management of preterm premature rupture of membrane; and prospective studies are needed for evaluation of the long-term sequel of neonatal morbidity in preterm premature rupture of membrane.

References

1. Mercer B. Preterm premature rupture of the membranes. Obstet Gynaecol. 2003; 101(1): 178-193.
2. McParland PC and Taylor DJ. Preterm prelabour rupture of the membranes. In

Bonnar J and Dunlop W (ED) Recent advances in Obstetric and Gynaecology. 2005; 23(3): 27-38.

3. Aboyeji AP, Abdul IF, Ijaiya MA, Nwabuisi C and Ologe MO. The bacteriology of prelabour rupture of membranes in Nigeria Teaching Hospital J Obstet Gynaecology. 2005; 25(8): 761-764.
4. Obi SN and Ozumba BC. Preterm premature rupture of foetal membranes: The dilemma of management in a developing nation. J Obstet Gynaecol. 2007; 27(1): 37-40.
5. Medina TM and Hill DA. Preterm premature rupture of membranes. Diagnosis and management. Am Fam. Physician. 2006; 73: 659-666.
6. Vintzileos AM, Cmpbell WA, Nochimson DJ: degree oligohydramnios andpregnancy outcome in patients with prom.*Obstet Gynecol* 1985, 66:162-
   7. [PubMed Abstract]
7. Mercer BM. Premature rupture of the membrane. In: Petraglia F, Strauss GF, Gabbe SG, Wises G. Complicated Pregnancy. 4th ed. London: informa health care; 2007. P.713-727.
8. Cunningham FG, LevineKJ, Bloom SL, Hath JC, Gilstrapl, Wenstrom KD. Williams'sobstetrics. 22th Ed. New York. MC Grewloll; 2005; 232-247].
9. Weismann-Brenner A, O'Reilly-Green C, Ferber A, Devon MY. Values of amniotic fluid index in cases of preterm premature rupture of membranes. J Perinatal Med. 2009; 6. [Pub ahead of print].
10. Blot M, Greenbush A. Neonatal outcome after prolonged rupture of the membranes starting in the second trimester. Arch Dis Child 1988; 63:1146-1150.
11. Acquire JC, Picard JC, Rebilled M, Claris O, Eco chard R, More S, et al. Neonatal outcomes after elective delivery management of preterm premature rapture of the membranes before 34 weeks' gestation. Ear J Oster Gynecology Repro'd Boil 2009; 143:18-23.
12. Yoon BH, Kim Yak, Romero R, Kim JC, Park KH, Kim MH, et al. Association of oligohydramnios in women with preterm premature Rupture of membranes with an inflammatory response in fetal, amniotic, and maternal compartments. Am J obstet Gynecol 1999; 181:784-788.
13. Weissmann-Brenner A, O'Reilly-Green C, Ferber A, Divon MY. Values of amniotic fluid index in cases of preterm premature rupture of membranes. J Perinat Med. 2009; 6.
14. Parry S, Strauss JF. Mechanisms of disease: premature rupture of the fetal membranes. N. Engl. J. Med 1998; 338: 663-70.
15. Meis JP, Ernest M, Moore ML: Causes of low birth weight births in public and private patients. Am J Obstet Gynecol 156:1165, 1987
16. Savitz DA, Blackmore CA, Thorp JM: Epidemiologic characteristics of preterm

delivery: Etiologic heterogeneity. Am J Obstet GynecoI 164:467, 1991.

17. American College of Obstetricians and Gynecologists. Premature rupture of membranes. ACOG Practice Bulletin 1. Washington, DC: ACOG; 1998.
18. Garite TJ. Management of premature rupture of membranes. Clin Perinatol. 2001; 28:837– 4.
19. Ohlsson A. Treatment of preterm premature rupture of the membranes: a meta-analysis. Am J Obstet Gynecol. 1989; 160:890 –906.
20. Capeless EL, Mead PB. Management of preterm premature rupture of membranes: lack of a national consensus. Am J Obstet Gynecol 1987; 157:11–2.
21. Furman B, Shoham-Vardi I, Bashiri A, Erez O, Mazor. M Preterm premature rupture of membranes is not an independent risk factor for neonatal morbidity.J Matern Fetal Med. 2001 Apr; 10(2):107-11.
22. Aaron B. Caughey, Julian N. Robinson, Errol R. Norwitz. Contemporary diagnosis and management of preterm premature rupture of membranes. Obstet Gynecol. 2008; 1(1):11-22.
23. Khashoggi TY Outcome of pregnancies with preterm premature rupture of membranes. Saudi Med J. 2004 Dec; 25(12):1957-61.
24. Smith G, Rafuse C, Anand N, Brennan B, Connors G, Crane J, Fraser W, et. al. Prevalence, management, and outcomes of preterm prelabour rupture of the membranes of women in Canada. J Obstet Gynaecol Can. 2005 Jun; 27(6):547-53.
25. Lee C. Yang, DO; Donald R. Taylor, DO; Howard H. Kaufman, DO; Roderick Hume, MD; Byron Calhoun, MD Maternal and Fetal Outcomes of Spontaneous Preterm Premature Rupture of Membranes. JAOA. 2004; 104 (12): 537- 542.
26. Helmer H. Continuing challenges in treating preterm labour: preterm prelabour rupture of the membranes. BJOG. 2006 Dec; 113Suppl 3:111-2.
27. Muris C, Girard B, Creveuil C, Durin L, Herlicoviez M, Dreyfus M. Management of premature rupture of membranes before 25 weeks. *Eur J Obstet Gynecol Reprod Biol*. Apr 2007; 131(2):163-8.
28. Joong Shin, Yoon BH, Romero R, Moon JB: The relationship between olighydrm-nios and the onset of preterm labor in prom. *Am J Obestet Gynecol* 2001, 184(3):459-62.
29. Natali Aziz, Yvonne W. Cheng, Aaron B. Caughey. Factors and outcomes associated with longer latency in preterm premature rupture of membranes. Journal of Maternal-Fetal and Neonatal Medicine. 2008; 21 (11): 821-825
30. Tanir HM, Sener T, Tekin N, Aksit A, Ardic N. Preterm premature rupture of membranes and neonatal outcome prior to 34 weeks of gestation. Int J Gynaecol Obstet. 2003 Aug; 82(2):167-72.

31. Schrag SJ, Cutland CL, Zell ER, Kuwanda L, Buchmann EJ, Velaphi SC, Groome MJ, Madhi SA; PoPS Trial Team.Risk factors for neonatal sepsis and perinatal death among infants enrolled in the prevention of perinatal sepsis trial, Soweto, South Africa. Pediatr Infect Dis J. 2012 Aug; 31(8):821-6.
32. Sims EJ, Vermillion ST, Soper DE: Preterm premature rupture of the membranes is associated with a reduction in neonatal respiratory distress syndrome. *Am J Obstet Gynecol* 2002, 187(2):268-72. 2002