A Study on the Management and Perinatal Outcome of Preterm Prelabour Rupture of Membranes at Delta State University Teaching Hospital, Oghara.

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Abstract

Background: Preterm Prelabour Rupture of Fetal Membranes and its management is a significant burden in obstetrics, occurring in 2–3% of all pregnancies and leading to 30–40% of preterm births. It is therefore a significant risk factor for perinatal morbidity and mortality arising from its association with fetal prematurity. The aim of this study was to review the management and perinatal outcome of PPROM in Delta State University Hospital, Oghara.

Methods: This was a descriptive retrospective study conducted in the Department of Obstetrics and Gynaecology, Delta State University Teaching Hospital from January 2011 to December 2015. The study included 80 pregnant patients presenting with Preterm prelabour rupture of membranes between 28 to 36weeks+6days.

Results: The prevalence of PPROM was 5.7%. Majority of the women were aged between 30-34 and ≥35 years and the mean parity was 1.48±1.55. 37% of the patients presented between 28-31 weeks. No apparent risk factor for PPROM was identified in 26% of the patients. 43% had vaginal delivery and mean birthweight of the babies was 1.53±0.52kg. Majority of the preterm neonates had first and fifth minute Apgar scores greater than 7. Perinatal mortality was 18.8% in this study.

Conclusion: Premature Prelabour Rupture of Membrane is associated with poor fetal outcomes arising from the problems of prematurity and neonatal sepsis. A clear understanding of its consequences is essential in providing adequate interventions needed in the prevention of unfavourable perinatal outcomes.

Keywords: PPROM, Incidence, Management, Perinatal outcomes

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Introduction

Preterm Prelabour Rupture of fetal Membranes is defined as the spontaneous rupture of membrane that occurs between the gestational ages of 28 and 37 completed weeks1 in resource poor countries. It occurs in 2-3% of all pregnancies and is associated with an increased risk of prematurity and neonatal sepsis.[2] It accounts for 60% of preterm deliveries, approximately 52 % of perinatal mortality in Nigeria[3], 18% - 20% in the United States and 70% globally[4-35]. PPROM is associated with significantly increased risk of maternal, fetal and neonatal morbidity and mortality resulting from associated complications. It can lead to significant fetal perinatal morbidity such as umbilical cord prolapse, placenta abruptio, respiratory distress syndrome, neonatal sepsis, and fetal death. Also, maternal morbidity may arise from postpartum partum haemorrhage, puerperal sepsis,

endometritis, delayed resumption of menstruation and Asherman syndrome[4,6-8]. In tropical countries such as Nigeria, where there is limitation of facilities and personnel for proper neonatal care as well as a high maternal mortality rate, PPROM poses a significant impact on dilemma in contemporary obstetric practice[9].

Although the cause of PPROM remains unknown in most cases but it's pathogenesis is related to the abnormal initiation of membrane stretch, local inflammation and ascending bacterial colonisation[6]. Inherent Weakness in the chorioamnion membrane has also been shown to be a cause of PPROM, which may be attributed to reduced collagen content 10. A number of risk factors have also been identified with PPROM. Some clinical factors associated with preterm PROM include low socioeconomic status, black race, low body mass index, tobacco use, previous history of preterm labour and PPROM history, vaginal bleeding at any time in pregnancy, multiple pregnancy and polyhydramnious[4,7-9].

The management of pregnancies complicated by PPROM is challenging and controversial in contemporary obstetrics and often times requires individualization of patients to achieve a favourable perinatal outcome 8. Accurate diagnosis of PPROM should be made and this requires a thorough history, physical examination including a sterile speculum exam to confirm liquor drainage as well as ancillary laboratory studies 4. These would allow for gestational age specific obstetric interventions to optimize perinatal outcome and reduce fetomaternal complications. For cases of PROM remote from term, expectant management has been of great value in the improvement of perinatal survival. In our environment where the chances of extra uterine survival of fetuses less than 28 weeks is low, PROM occurring before 34 weeks gestation are usually managed conservatively[9]. This usually involves the use of antibiotics, steroid therapy, in addition to fetal monitoring. These measures have occasionally improved neonatal outcomes[4,11,13].

Diversity of opinions exists still globally on the management preterm PROM. In Canada and Australia, there is a lack of consensus on management of cases with PROM occurring between gestational ages of 34 and 37 weeks14. However, the American College of Obstetricians and Gynaecologists (ACOG) recommends Induction of Labour at gestational age of 34 weeks 11. Though the Royal College of Obstetricians and Gynaecologists guidelines recommend that delivery at gestational age of 34 weeks should be considered, they were however less specific on the process of delivery[13].

However, the management of PROM at term have favoured immediate delivery usually where there is no contraindication by induction of labour 14. In a recent study by Morris et al involving a multicentre randomised controlled trial, the findings showed that in the absence of overt signs of infection or fetal compromise, a policy of expectant management with appropriate surveillance of maternal and fetal wellbeing should be followed in pregnant women who present with ruptured membranes close to term[15].

On the backdrop of this, the study was conducted to review the management and perinatal outcome of PPROM in Delta State University Teaching Hospital, and further provide a framework for the management of such cases within the region.

Methods

This study was a descriptive retrospective study done over a 5 year period at the Delta State University Teaching Hospital, Oghara, Nigeria

between January 1st 2011 and December 31st 2015. Information was obtained from antenatal records, labour ward records and patients' case files. Data of 86 women who presented with PPROM were obtained. Information extracted were socio-demographic characteristics (maternal age, parity, level of education, and gestational age), birth weight, Apgar scores at 1st and 5th minutes and fetal outcome.

The data were analyzed by descriptive statistics using the statistical package for social science version 22 (SPSS Inc. Chicago, IL, USA) and the results expressed in descriptive statistics by simple percentages.

All confirmed singleton pregnancies of spontaneous PPROM more than 28 week and less than 37 weeks.

All cases of intact membrane, less than 28 weeks of gestational age, bleeding per vaginum, multiple pregnancies, any complication of pregnancy other than PROM that affect fetal and neonatal outcome e.g. IUGR, foetal malformation, preeclampsia, onset of labour within one hour of admission.

The diagnosis of PPROM was established by history, sterile pelvic speculum examination showing amniotic fluid trickling from cervix or in the posterior vaginal fornix and pad test. An Ultrasonography was done in each case to assess gestational age, presentation, exclusion of congenital anomalies and amniotic fluid index.
Conservative management was done where there was no contraindication in PPROM cases of 28weeks to 33weeeks+6days till the onset of spontaneous labour or till the maternal or fetal indication for delivery ensues such as chorioamnionitis, meconium stained amniotic fluid, abruption, cord prolapse, fetal distress and/or advanced labour on admission. In PPROM cases >34weeks, patients were induced with either misoprostol or oxytocin if not in spontaneous labour. Patients were hospitalized until delivery two doses of dexamethasone 12 mg I.M 12 hours apart were given to the mothers <34weeks to enhance fetal lung maturity. Prophylactic antibiotics were used in all cases for ten days or up to delivery (whichever is later) to reduce the risk of infection. Maternal monitoring to detect chorioamnionitis was done by monitoring pulse rate, temperature, abdominal tenderness, colour and smell of liquor and cardiotocography C.T.G.

Intrapartum fetal monitoring was done using CTG. Mothers were monitored for complications such as abruption, PPH, retained placenta. After delivery, neonates with poor Apgar score or infection were admitted into Neonatal Intensive Care Unit (NICU) for further management and their outcome were studied.

Results

This was a 5-year prospective observational study, from January 2011 to December 2015 which involved 80 parturients who presented with preterm prelabour rupture of membranes.

During the study period, a total of 1,398 deliveries took place in the study centre, giving a preterm prelabour rupture of membranes incidence of 5.7%.
The results are outlined in tables below:

Table 1: Socio – demographic characteristics of Parturients with preterm rupture of membrane

Variable		N (%)
AGE (years)	..	4 (5.0)
	20-24	9 (11.2)
	25-29	21 (26.2)
	30-34	23 (28.7)
	..	23 (28.7)
	Total	80 (100.0)
PARITY	0	26 (32.5)
	1-4	50 (62.5)
	≥5	4 (5.0)
	Total	80 (100.0)
LEVEL OF EDUCATION	NONE	1 (1.2)
	PRIMARY	23 (28.7)
	SECONDARY	36 (45.0)
	TERTIARY	20 (25.0)
	Total	80 (100.0)
ESTIMATED GESTATIONAL AGE	<28WEEKS	15 (18.7)
	28-31	37 (46.2)
	32/33	9 (11.2)
	34-36	19 (23.7)
	Total	80 (100.0)

In this study, majority of the parturients were aged between 30-34 and ≥35 years with a mean age of 30.4±6.07 years. The modal parity group was para 1-4 with a mean parity of 1.48±1.55. The parturients mostly had secondary level of education with the majority presenting at 28 – 31weeks gestation.

Table 2: Risk factors for Preterm rupture of membrane

RISK FACTORS	N (%)
NONE	26 (32.5)
UTI	11 (13.8)
MALARIA	12 (15.0)
MULTIPLE GESTATION	5 (6.3)
ANAEMIA	7 (8.8)
PREECLAMPSIA/ECLAMPSIA	11 (13.8)
CONGENITAL ANOMALY	1 (1.3)
RVD	6 (7.5)
SICKLE CELL DISEASE	1 (1.3)
Total	80 (100)

No apparent clinical risk factor for PROM was identified in majority of the parturients.

Table 3: Mode of delivery of Parturients with preterm rupture of membranes

Variables		N	(%)
INDUCTION OF LABOUR	YES	33	(41.2)
	NO	47	(58.8)
	Total	80	(100.0)
MODE OF INDUCTION	OXYTOCIN	21	(63.6)
	MISOPROSTOL	12	(36.4)
	Total	33	(100.0)
MODE OF DELIVERY	VAGINAL DELIVERY	43	(53.8)
	CAESAREAN SECTION	37	(46.2)
	Total	80	(100.0)
INDICATION FOR CS	2 PREVIOUS CS	2	(5.4)
	FETAL DISTRESS	8	(21.6)
	TRANSVERSE LIE	3	(8.1)
	CORD PROLAPSE	1	(2.7)
	BREECH PRESENTATION	8	(21.6)
	SEVERE OLIGOHYDRAMNIOUS	7	(18.9)
	CHORIOAMNIONITIS	4	(10.8)
	SEVERE PRE ECLAMPSIA/ECLAMPSIA WITH UNFAVOURABLE CERVIX	2	(5.4)
	RVD	1	(2.7)
	MULTIPLE GESTATION	1	(2.7)
	Total	37	(100.0)

Majority of the parturients were not induced, however where this was done, oxytocin was mainly used. More than half of the parturients delivered vaginally while the commonest indications for a caesarean section were fetal distress and breech presentation.

Table 4: Perinatal outcomes in Parturients with preterm rupture of membranes

Variables		N (%)
BIRTH WEIGHT (kg)	<1	9 (11.2)
	1-1.49	36 (45.0)
	1.5-2.49	29 (36.2)
	≥2.5	6 (7.5)
	Total	80 (100.0)
APGAR SCORE IN 1ST MINUTE	≤3	12 (15.0)
	4/5	18 (22.5)
	6	12 (15.0)
	≥7	38 (47.5)
	Total	80 (100.0)
APGAR SCORE IN 5TH MINUTE	≤3	4 (5.0)
	4/5	8 (10.0)
	6	4 (5.0)
	≥7	64 (80.0)
	Total	80 (100.0)
GENDER	F	41 (51.2)
	M	39 (48.8)
	Total	80 (100.0)
PERINATAL MORTALITY	YES	15 (18.8)
	NO	65 (81.2)
	Total	80 (100.0)

The modal age group was 1 – 1.49kg with a mean birthweight of 1.53±0.52kg. Majority of the preterm neonates had first and fifth minute Apgar scores greater than 7. The mean Apgar score in the first minute was 6.09±2.23 and 7.91±2.26 in the fifth minute. Perinatal mortality was 18.8%. Females comprised more than half of the neonates delivered, majority of whom were alive at the end of the first week post-delivery.

Discussion

The global incidence of PPROM has been noted in studies to be 1-3% of all pregnancies. The incidence of PPROM in this study was 5.7% which is higher than the global incidence and that reported in Enugu, Oshogbo and Ethopia[1,8,14]. However, this was less than the incidence reported by Shehla et al. in Pakistan1. Wider variations in incidence has be shown, as an incidence of 2-18% had also been reported[14]. Therefore, the incidence in this study is not out of place.

Majority of the patients were > 30 years of age. This finding corroborated with Stuart et al who reported that the incidence of PROM rose with advancing maternal age 14. However, this contradicts the finding noted in the study by Okeke et al, and Emechebe in Nigeria 8,9 .Among the total study population 62.5% were multigravida while 26% were primigravida. This was similar to findings in the study by Osaikhuwuomwan and Osemwenkha but contradicts that of Okeke, Diraviyam and Biniyam et al where majority were primigravida[1,2,5,8]. This study showed that 45% of the patients had secondary level of education with majority presenting at a gestational age of 28-31 weeks. PPROM has been associated with low socioeconomic status4. Studies have shown various risk factors associated with PPROM such as a previous history of PPROM, smoking, black race, multiple gestation amongst others[4,10]. However, in this study, majority of the parturients had no obvious risk factor at presentation. This was similar to the study done in Calabar[9].

The management of pregnancies complicated with PPROM is highly controversial and challenging in contemporary obstetrics and as such, it should be individualized[1]. Conservative management has been advocated in a bid to improve fetal outcome[16]. Administration of adjunctive prophylactic antibiotics as well as single course of steroids (for fetuses < 34 weeks gestational age) is one of the interventions known to improve obstetric outcome[11]. The goal of antibiotic therapy is to reduce the frequency of maternal and fetal infection and delay the onset of preterm labour (i.e., prolong latency period) while the steroids reduce the incidence of respiratory distress syndrome[12,17]. A recent study by Morris et al showed that in the absence of overt signs of infection or fetal compromise, a policy of expectant management with appropriate surveillance of maternal and fetal wellbeing should be followed in pregnant women who present with ruptured membranes close to term[15]. Parturients in this study were conservatively managed.

A total of 53 % of the patients had vaginal delivery whereas 37% had caesarean delivery. The incidence of higher vaginal delivery rate was similar to the findings by Emechebe et al and Nagaria et al 9,7. Thirty three percent had induction of labour with oxytocin being the commonest agent used in 63.6% of the patients , similar to the study by Adeniji14.The caesarean section rate of 37 % in this study was higher than that of 35.4% reported by Emechebe 9. Fetal distress and breech presenting foetus was the commonest indication for caesarean section.

With respect to fetal outcome, 81.2% of the babies were low birth weight with 36.2 % being within the very low birth weight category. This was also noted in studies by Okeke, Nagaria and Diravyam[2,7,8]. The implication of such a high number of low birth weight is that this would burden the neonatal intensive care facilities and personnel in the hospital and may affect the neonatal outcome adversely. This study showed that majority of the babies had good Apgar scores in the 1st and 5th minute. This may be due to the fact that a course of steroids was given to reduce

the rate of respiratory distress syndrome [13]. Perinatal mortality in this study was 18.18% which is similar to that in Lagos but lower than 21.7% reported by Khan[3,10].

The major limitation of this study is it was a small scale retrospective study and it was not possible to analyse the indication for NICU admissions due to incomplete information in the medical records. Thus the findings of this study may not truly reflect the situation in the general population. Despite the limitations, this study has provided baseline information on PPROM in our locality and is a stepping stone towards further research on PPROM among Nigerian women.

Conclusion

PPROM is a major complication of pregnancies and an important cause of perinatal morbidity and mortality as seen in this study. Prompt diagnosis and management is required for good fetomaternal outcome. At earlier gestation, conservative management with careful surveillance should be adopted to improve fetal survival rates and this can be further achieved by multidisciplinary approach involving the obstetrician and the neonatologist.

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