# Pre-Labour Rupture of Membranes at Term: A Review of Management in a Health Care Institution

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## ABSTRACT

**Background:** *Pre-labour rupture of membranes (PROM) at term is often encountered in current obstetric practice. Its management is sometimes controversial.*

**Objectives:** *This was to determine the incidence, management modalities and pregnancy outcomes of cases of pre-labour rupture of membranes at term in Nnewi, South-east Nigeria.*

**Methods:** *This was a retrospective review of cases of PROM at term in Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Nigeria over a 5-year period (January 2005 - December 2009). Their demographic and obstetrics records were extracted and the findings were analysed using SPSS version 15.0.*

**Results:** *During the study period, there were 3,513 deliveries and 86 cases of PROM at term, giving an incidence of 2.4%. Of the 86 cases, only 74 (86.0%) case files were available for analysis. The mean age and gestational age of the patients were 26.9±3.9 years and 38.8±1.7 weeks respectively.*

*Vaginal delivery was aimed at 60 (81.1%) patients, of which 18 (30.0%) and 7 (11.7%) patients had immediate stimulation of labour with oxytocin and intravaginal misoprostol respectively. Ten (16.7%) and 6 (10.0%) patients had delayed stimulation of labour with oxytocin and intravaginal misoprostol respectively. Nineteen (31.7%) patients had spontaneous labour within 12 hours of rupture of membrane. Only 3(5.0%) patients had failed stimulation of labour. Vaginal delivery success rate was 95.0% while 17 (23.0%) patients were delivered by caesarean section (CS).*

*There was no significant difference in the 1 and 5-minutes APGAR scores <7 of babies delivered following immediate compared with delayed stimulation of labour and following stimulation of labour compared with spontaneous onset of labour (p>0.05). The mean duration of hospital stay was 6.1± 1.3 days and 10.9 ± 1.7 days for patients that had vaginal delivery and CS respectively. There was no recorded maternal death but the perinatal mortality rate was 0.26 per 1000 deliveries.*

**Conclusion:** *The incidence of PROM at term was high in Nnewi. While stimulation of labour was safe and effective, the pregnancy outcomes did not significantly depend on the time and methods of stimulation of labour or route of delivery. Further study may be necessary to substantiate these findings.*


**Key Words:** *PROM, stimulation of labour, oxytocin, misoprostol.*

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## INTRODUCTION

Pre-labour or premature rupture of membranes (PROM) is defined as rupture of membranes before the onset of labour irrespective of the gestational age[1]. It could be term or preterm depending on the gestational age it occurred. Membrane rupture that occurs at or beyond 37 weeks of gestation is defined in this study as term PROM (TPROM).

PROM poses one of the most important therapeutic dilemmas in current obstetric practice, complicating approximately 5% to 10% of term pregnancies and up to 30% of preterm deliveries[2,3]. When PROM occurs at term, labour typically ensues spontaneously or is induced within 12 to 24 hours[1]. At term, 50% of pregnancies complicated by PROM will go into labour spontaneously within 12 hours, 70% within 24 hours, 85% within 48 hours, and 95% within 72 hours in the absence of obstetric intervention[4,5,6].

The interval between membrane rupture and the onset of labour is referred to as the latency interval[4]. There is little consensus on how long this interval should be in order to substantiate the judgement that rupture of membranes did not coincide with onset of labour. Currently, a preference for the latency interval of one-hour is required to fulfill the diagnosis of PROM[7,8].

The management of PROM at term is sometimes controversial. The major question regarding management of these patients is timely and accurate diagnosis and whether to allow them to enter labour spontaneously or to stimulate labour. Usually, the management of these patients depends on their desires or wishes. Evidence supports the idea that stimulation of labour, as opposed to expectant management, decreases the risk of chorioamnionitis without increasing the caesarean delivery rate[9,10].

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Hannah et al[11] revealed that stimulation of labour and expectant management resulted in similar rates of caesarean delivery and neonatal infection in women with PROM at term. Hannah and colleague also showed that the stimulation of labour with oxytocin resulted in a lower risk of maternal infection such as endometritis when compared with expectant management[11]. Additionally, the women in the study viewed stimulation of labour more favourably than expectant management[11].

At term, infection remains the most serious complication associated with PROM for the mother and the baby. The risk of chorioamnionitis with term PROM has been reported to be less than 10% and to increase to 40% after 24 hours of PROM[12]. This illustrates the importance of appropriate management strategies for PROM at term.

Nevertheless, the incidence and management modalities of PROM at term in Nnewi have remained largely uninvestigated. Additionally, most studies in Nigeria on PROM were on preterm PROM[13,14]. To this end, this study aims to determine the incidence, management modalities and pregnancy outcomes of cases of pre-labour rupture of membrane at term in Nnewi, South-east Nigeria. The result, we believe, will highlight the relevant issues of such obstetric entity and ways of improving future management.

## METHODS

The case files of parturients who had pre-labour rupture of membrane (PROM) at term and delivered between 1st January, 2005 and 31st December, 2009 in the Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-east Nigeria were recovered from the medical records department of the teaching hospital. The age and parity of the mothers, the gestational age at the time of occurrence of the PROM, the duration of rupture of membrane (ROM), mode of onset of labour and delivery, the fetal and the maternal outcome were examined. The duration of hospital stay including 6 weeks of postnatal attendance were also extracted. The total number of deliveries for the period was also determined.

All patients with multiple gestation and patients unsure of their date were excluded from the study. The information extracted was analyzed using SPSS version15.0 for windows. The outcomes of pregnancy were compared using the Chi square test. The p-value of less than 0.05 was taken as significant.

## RESULTS

During the period under review (1st January, 2005 - 31st December, 2009), there were 3,513 deliveries and 86 cases of term PROM, giving a prevalence of 2.4%. A total of 74 (96.6%) case files contained enough information and they formed the basis of further analysis.

The mean age of the patients was 26.9±3.9 years and the mean gestational age at occurrence of the PROM was 38.8±2.7 weeks. Forty-nine (66.2%) patients were booked while 25(33.8%) were unbooked. All the patients were of low parity (para 0-2). Nulliparity constituted the largest group, 46(62.2%), followed by para 1(21.3%) and para 2(16.5%).

A total of 61(82.4%) patients were delivered within 24 hours of membrane rupture, while 12(16.2%) patients were delivered between 2nd and 3rd day of rupture of membrane. Only one patient delivered after 3 days of rupture of membrane.

Sixty (81.1%) patients were aimed at vaginal delivery. Of these 60 patients, 18(30.0%) had immediate stimulation of labour with intravenous oxytocin infusion, while 7 (11.7%) patients had immediate intravaginal misoprostol tablets. Ten (16.7%) patients had delayed stimulation with intravenous oxytocin infusion after an expectant period of 12 hours while 6(10.0%) patients had intravaginal misoprostol tablets inserted after the same expectant period. Nineteen (31.7%) patients had spontaneous onset of labour within 12 hours of rupture of membrane.

As shown in table I, there was no significant difference in the 1- or 5-minute APGAR scores <7 between babies delivered following immediate cervical ripening and or stimulation of labour and delayed cervical ripening and or stimulation of labour ($X^2$=1.613; df=1; p>0.05). Similarly, there was no significant difference in the APGAR scores <7 of babies delivered following stimulation of labour and spontaneous onset of labour ($X^2$ =0.219; df=1; p>0.05). This is shown in table I.

Of the 60 patients that were aimed at vaginal delivery, 57 patients were successfully delivered vaginally, giving

a vaginal delivery success rate of 95.0%. Seventeen (23.0%) patients were delivered by caesarean section. Of these 17 patients who were delivered via caesarean section, 13 had previous caesarean section scar while three patients had c/s due to failed stimulation of labour. There was no significant difference in the 1- or 5-minute APGAR scores < 7 between babies delivered vaginally and those delivered by caesarean section ($X^2$ =0.194;df=1;p>0.05). This is shown in Table I.

The mean duration of hospital stay was 6.1± 1.2 days for vaginal delivery and 10.9±1.7 days for caesarean section delivery. None of the patients had documented clinical evidence of chorioamnionitis. The mean birth weight was 3.3 ± 1.2 kg.

There were 9 perinatal deaths, giving a perinatal mortality rate of 0.26 per 1000 deliveries. There was no recorded maternal death. Only 9 (12.2%) patients had a six -week postnatal clinic attendance.

**TABLE I: RELATIONSHIP BETWEEN TIME AND METHODS OF STIMULATION OF LABOUR OR ROUTE OF DELIVERY AND LOW APGAR SCORE**

| VARIABLES | APGAR SCORE <7 AT 1MIN (FREQ) | APGAR SCORE <7 AT 5MIN (FREQ) | P-VALUE |
|---|---|---|---|
| 1. TIME OF STIMULATION | | | |
| i. IMMEDIATE | 8 | 0 | >0.05 |
| ii. DELAYED | 5 | 1 | |
| 2. ONSET OF LABOUR | | | |
| i. STIMULATED | 13 | 1 | >0.05 |
| ii. SPONTANEOUS | 6 | | |
| 3. MODE OF DELIVERY | | | |
| i. VAGINAL | 16 | 2 | >0.05 |
| ii. CAESAREAN | 4 | 1 | |

## DISCUSSION

The study has revealed that the incidence of premature rupture of membranes (PROM) at term was 2.4%. Although this finding was high, it was below the range of the 5-10% reported in the literature[1,2]. However, missed diagnosis could be a factor contributing to this trend. In the majority of time, before the patient present to the hospital following rupture of membrane, they may already have been in established labour and as such, could lead to non documentation of such cases of PROM at term.

The most significant maternal risk of term PROM is intrauterine infection, which is a risk that increases with the duration of membrane rupture. Unlike in other studies,[12-15] there were no recorded cases of clinical evidence of chorioamnionitis in this study. The reason for this peculiar finding could be that a significant number of the patients might not have had multiple digital vaginal examinations before presentation to the hospital, since majority (>65%) of the patients in this study were booked. Effective and prompt management could be contributory since the majority of the patients were delivered within 24 hours of membrane rupture.

There was no significant difference in the 1- or 5-minute APGAR scores between babies delivered following immediate cervical ripening and or stimulation of labour and delayed cervical ripening and or stimulation of labour (p>0.05). There was also no significant difference in the 1- or 5-minute APGAR scores between babies delivered vaginally and those delivered by caesarean section (p>0.05). There was also no trend towards a higher number of failed stimulation of labour in those that had stimulation of labour. This finding agrees with other reports in the literature[15].

In this study, more than 80% of patients were delivered within 24 hours of membrane rupture. This finding was expected. It is an established fact that when PROM occurs at term, labour typically ensues spontaneously or is induced within 12 to 24 hours1. This finding could be substantiated with the fact that approximately 30% of patients in this study had spontaneous onset of labour within 12 hours of rupture of membrane, although up to 90% of the patients have been shown in the literature to enter spontaneous labour within 24 hours when they experience rupture of membranes (ROM) at term[1]. The immediate intervention instituted in these patients could be responsible for this observation.

The caesarean section rate in this study was not increased or reduced in women with premature rupture of membranes at term by the administration of misoprostol and or oxytocin for labour stimulation. This is because the vaginal delivery success rate was up to 95%. Also, almost all (86.7%) the caesarean sections in this study were performed due to previous caesarean section scar, rather than failed stimulation of labour which was only seen in three (13.3%) patients. This was similar to a study in Kano[16]. Therefore, misoprostol and or oxytocin appear to be effective and safe for causing cervical dilatation and effacement and stimulating labour in patients with premature rupture of membranes at term.

Management of cases of PROM at term is often influenced by the patients' desires or wishes. This could explain why majority of patients who had vaginal delivery in this study, had obstetric interventions. In some studies, women who had PROM at term viewed induction of labour more favourably than expectant management.[11] This reason however might have influenced the decisions taken by the obstetric care providers in this study.

In this study, the mean birth weight of 3.3 ± 1.2 kg was normal and not surprising. This was because the pregnancies were term. Also, majority of these patients were booked and as expected, would have low rate of intra uterine growth restriction.

Although the majority of patients delivered within 24 hours of membrane rupture, the relative prolonged duration of hospital stay in both patients that delivered vaginally and by caesarean section were not compatible. Also, there was no documentation of clinical evidence of postpartum infection in this present study. These findings could be difficult to explain. However, absence of postpartum complications could not be ruled out. Poor documentation in the case files for the presence of complications postpartum could be contributory.

This study has also revealed that routine 6 weeks post-natal clinic attendance was poor. This was also contrary to the fact that the majority of the patients were booked. This cannot be quite explained. However, having booked for antenatal care, they would have been counseled on the importance of postnatal care.

In conclusion, the incidence of PROM at term was high in our center and a number of factors could contribute to this trend. While stimulation of labour was safe and effective, the pregnancy outcome did not significantly depend on the time and methods of stimulation of labour or route of delivery. The six weeks post-natal attendance was found to be poor. Further study may be necessary to substantiate these findings.

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