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**Original Research Article**

# Effect of premature rupture of membranes on the maternal and fetal prognosis during childbirth at the gynecology-obstetrics department of the Matam Communal Medical Center, Conakry, Guinea

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## ABSTRACT

**Background:** Premature rupture of membranes (RPM) is defined by rupture of the amnion and chorion before entering labor within 24 hours leading to vaginal discharge of amniotic fluid without uterine contractions. Objective of this study was to improving the management of premature Ruptures of the membranes received in the service.
**Methods:** This was a descriptive and analytical prospective study lasting six months from January 1 to June 30 2016.
**Results:** During the study period, we collected 108 cases of RPM out of 1543 deliveries, representing a hospital frequency of 7%. RPM had more frequently concerned pregnant women aged 25-29 (37.04%), housewife (37.03%), primiparous (45.37%) and referral (52.78%). 95.37% were single pregnancies with cephalic presentation (80%) received between 37-42 weeks (84.26%). Management mainly consisted of antibiotic prophylaxis (100%), fetal pulmonary maturation and childbirth. The vagina was the main mode of delivery (62.04%). The maternal prognosis was dominated by chorioamnionitis (12.96%). The fetal one was made up of respiratory distress (40.71%) and prematurity (12.39%).
**Conclusions:** RPM is frequent at the Matam municipal medical center. It is essential for its prevention to ensure health education of the population in general and genital hygiene in particular, to make a coherent prenatal follow-up while putting a particular accent on the detection and the treatment of genital infections.

**Keywords:** Maternal and fetal prognosis, Premature rupture of membranes

## INTRODUCTION

Premature rupture of membranes (RPM) is defined as rupture of the amnion and chorion before entering labor within 24 hours leading to vaginal discharge of amniotic fluid without uterine contractions.[1] In 80% of cases, a frank flow of amniotic fluid, either felt by the patient or visualized under speculum by the clinician, poses the

diagnosis.[2,3] RPM occurs in 8-10% of term pregnancies.[4] Worldwide, it concerns 4/1000 births.[5] It occurs in France, for 2 to 3% of pregnancies before 37 weeks of amenorrhea (SA), or nearly 25,000 patients per year.[6] Before term (37 weeks, premature rupture of the membranes is responsible for increased neonatal morbidity and mortality, essentially linked to prematurity, the risk of neonatal infection and the occurrence of obstetric complications (retro-placental hematoma, procidence of the cord).[7] It contributes to more than 30% of premature births and almost 20% of perinatal mortality.[8,9]

The fetal prognosis in the case of RPM is linked to gestational age, the older the age, the better the prognosis. Much progress remains to be made in this situation to reduce the maternal-fetal mortality rate during this difficult period for pregnant women. Obstetric management in the case of PMR is to avoid premature birth while protecting the fetus from infection, a source of worsening neonatal mortality and maternal-fetal morbidity. Before 34SA, treatment is conservative with in utero transfer, antibiotic prophylaxis and corticosteroid therapy.[10] In most cases, the RPM will precede the start of spontaneous work within 24 hours by a few hours or days. However, it is an infectious risk factor, especially for chorioamniotitis and neonatal infections.[11]

The recommendations of the National College of French Gynecologists and Obstetricians (CNGOF) of 1999 are in favour of the systematic initiation of labor compared to an expectation attitude in the long term due to a lower maternal and neonatal morbidity and a greater satisfaction of the patients. If an expectation is considered, the time between the RPM and the trigger should not exceed 48 hours.[12] Despite the efforts made to improve the management of RPM, morbidity and materno-fetal mortality remain very high in our countries. The aim of this study is to contribute to improving the management of premature rupture of membranes in order to improve the maternal and neonatal prognosis.

## METHODS

The gynecology-obstetrics department of the Matam Communal Medical Center served as a study framework. It was a cross-sectional, descriptive and analytical study of 6 months, from January 1 to June 30, 2016. The minimum sample size was 108 patients.

### *Inclusion criteria*

- Were included in this study all the cases of RPM diagnosed from 28 SA and having given birth in the service during the period of this study.

### *Exclusion criteria*

- Patients whose term is less than 28 weeks of amenorrhea, those whose management has not taken place in the department those in whom the discharge has not been objectified.

### *Variables*

The variables studied include the socio-demographic profile, the circumstances of admission, the characteristics of the pregnancy, the care and the maternal and fetal prognosis. The data were entered and analyzed using Epi Info version 6 software. The statistical test used is Chi-square, with a significance level fixed at $p < 0.05$.

### *Limits*

The low capacity of the service for the sufficient time hospitalization of patients, the non-performance of certain laboratory examinations whose results would improve the management, the non-computerization of service data.

### *Consent*

Before carrying out the study, we obtained the agreement of the administrative authorities of the service, the patients gave their consent to participate in the study, confidentiality was respected throughout the data collection procedure and the results were used for strictly scientific purposes.

## RESULTS

### *Frequency of RPM in relation to total number of deliveries*

During the study, we collected 108 cases of MMR out of 1,543 deliveries, which represents a hospital frequency of 7%.

**Table 1: Socio-demographic characteristics and obstetrical history.**

| Age | Staff | % |
|---|---|---|
| 15-19 years old | 15 | 13.89 |
| 20-24 years old | 30 | 27.78 |
| 25-29 years old | 40 | 37.04 |
| 30-34 years old | 13 | 12.04 |
| 35 years old and over | 10 | 9.26 |
| **Profession** | | |
| Housewives | 40 | 37.03 |
| Liberal functions | 28 | 25.93 |
| Pupils/students | 27 | 25.00 |
| Employees | 13 | 12.04 |
| Parity nulliparous | 22 | 20.37 |
| Primipares | 33 | 30.56 |
| Paucipares | 49 | 45.37 |
| Multiparous | 04 | 3.70 |
| **Total** | **108** | **100** |

Average age: 27.51 years Extreme: 15-38 years old

*Sociodemographic profile and obstetrical history*

The average age of our patients was 27.51% with extremes of 15 and 38 years, the age group between 25 and 29 years was more dominant at 37.04%; nearly 28% were between 20 and 24 years old. Housewives were the most concerned in this study, with a proportion of 37.03%, followed by those working in the liberal professions (seamstresses, dyers, hairdressers, shopkeepers) for a proportion of 25.93%.

**Table 2: Circumstances of admission and pregnancy characteristics.**

| Circumstances of admission | Staff | % |
|---|---|---|
| Coming from home | 51 | 47.22 |
| Evacuated or referred | 57 | 52.78 |
| **Gestational age (SA)** | | |
| ≤36 | 10 | 9.26 |
| 37-42 | 91 | 84.26 |
| More than 42 | 7 | 6.48 |
| **Type of pregnancy** | | |
| Single pregnancy | 101 | 93.37 |
| Twin pregnancy | 07 | 06.63 |
| Fetal presentation cephalic | 86 | 80.00 |
| Headquarters | 17 | 16.00 |
| Oblique | 05 | 04.00 |
| **Total** | **108** | **100** |

*Circumstances of admission and characteristics of pregnancy*

Pregnant women referred or evacuated from another structure predominated, i.e., 52.78%. The rest came directly from their home.

Most patients carried a full-term pregnancy (84.26%) otherwise between 37 and 42 weeks.

Nearly all the pregnant women 103/108 cases, i.e. 95.37% had a single pregnancy compared to 4.63% (5 cases) of twin pregnancies. The cephalic presentation was the most represented with a proportion of 80% followed by the breech with a proportion of 16%.

***Support***

In 100% of the cases, we proceeded with antibiotic prophylaxis; 52.78% of our gestates were hospitalized. Fetal lung maturation was carried out in 9.26% of gestates.

Nearly a third (32.41%) of pregnant women benefited from the artificial induction of labour compared to 43.52% who went into labour spontaneously.

The vaginal route was the most common mode of delivery, with 62.04% compared to 37.96% by caesarean section.

**Table 3: Breakdown of 108 patients according to management.**

| Support | Effective | % |
|---|---|---|
| Antibioprophylaxis | 108 | 100 |
| Hospitalization | 57 | 52.78 |
| Pulmonary maturation by corticosteroid therapy | 10 | 9.26 |
| Artificial release | 35 | 32.41 |
| Spontaneous work | 47 | 43.52 |
| Low birth canal | 67 | 62.04 |
| Caesarean section | 41 | 37.96 |

***Maternal and fetal prognosis***

*Maternal and fetal prognosis according to complications*

In our series, the maternal prognosis was favourable in 84.26% of cases, unfavourable with complications (chorioamniotite 12.96% and parietal suppuration 2.78%).

**Table 4: Distribution of 108 patients according to maternal complications.**

| Complications | Frequency | % |
|---|---|---|
| Kindergarten | | |
| Uncomplicated | 91 | 84.26 |
| Chorioamnionitis | 14 | 12.96 |
| Parietal Suppuration | 3 | 2.78 |
| **Total** | **108** | **100** |
| **Foetal** | | |
| Respiratory distress | 46 | 40.71 |
| Prematurity | 14 | 12.39 |
| Cord protrusion | 4 | 3.54 |
| Uncomplicated | 49 | 43.36 |
| **Total** | **113** | **100** |

Fetal morbidity was dominated by respiratory distress (40.71%) and prematurity (12.39%).

*Maternal and fetal prognosis according to mode of delivery*

Concerning maternal complications and mode of delivery for 41 pregnant women who were caesareanized, 12.04% had a chorioamniotite compared to a little less than 1% by the vaginal route.

Establishing the link between the mode of delivery and foetal complications, the results show that 29.20% of new-borns delivered by caesarean section presented respiratory distress compared to 11.50% of new-borns delivered by vaginal delivery.

It has been found that the amniotic fluid can take on several colours, either clear, yellowish or greenish. Normally the amniotic fluid is clear, during the results

show that a little more than 50% of the patients had an amniotic fluid that was either greenish 44.25% or yellowish 7.96%. The results also show that mothers admitted with greenish or yellowish amniotic fluid often give birth to new-borns with complications such as neonatal infections, respiratory distress.

**Table 5: Maternal morbidity by mode of delivery.**

| Mode of delivery maternal | complications | | | |
|---|---|---|---|---|
| **Mode of delivery** | **Chorioamnionitis** | **Parietal suppuration** | **Uncomplicated** | **Total** |
| Caesarean | 13 (12.04%) | 3 (2.78%) | 26 (24.07%) | 41 (37.96%) |
| Low track | 1 (0.93%) | 0 (0.00%) | 65 (60.19%) | 67 (62.04%) |
| **Total** | **14 (12.96%)** | **3 (2.78%)** | **91 (84.26%)** | **108 (100%)** |

ddl = 2, p value = 0.0030.

**Table 6: Fetal morbidity by mode of delivery.**

| Mode of delivery fetal | | Complications | | | |
|---|---|---|---|---|---|
| **Mode of delivery** | **Respiratory distress** | **Cord protrusion** | **Prematurity** | **No complications** | **Total** |
| Caesarean section | 33 (29.20%) | 3 (2.65%) | 4 (3.54%) | 6 (5.31%) | 46 (40.71%) |
| Low track | 13 (11.50%) | 1(0.88%) | 10 (8.85%) | 43 (38.05%) | 67 (59.29%) |
| **Total** | **46 (40.71%)** | **4 (3.54%)** | **14 (12.39%)** | **49 (43.36%)** | **113 (100%)** |

ddl = 2, p value = 0.0030.

**Table 7: Amniotic fluid colours and fetal prognosis.**

| Aspect of flow fetal | | Prognosis | |
|---|---|---|---|
| **Aspect of the flow** | **Good** | **Good** | **Total** |
| Yellowish | 2 (1.77%) | 7 (6.19%) | 9 (7.96%) |
| Clear liquid | 50 (44.25%) | 4 (3.54%) | 54 (47.79%) |
| Greenish | 6 (5.31%) | 44 (38.94%) | 50 (44.25%) |
| **Total** | **58 (51.33%)** | **55 (48.67%)** | **113 (100%)** |

## DISCUSSION

***Frequency of RPM compared to the total number of deliveries***

Our hospital frequency of 7% premature rupture of the membranes is between the 6% found by Yasmina A et al, in Morocco in 2017 and the 8.2% found in Israel in 2016 by Ashwal E et al.[13,14]

This rate could be explained by the fact that the framework of the study is a referral service which receives several obstetric evacuations from peripheral health structures.

***Sociodemographic characteristics and obstetric history***

*Age*

The average age of our patients was 27.5 years with extremes of 15 and 38 years. The age group between 25 and 29 years old had more than 1/3 of the patients (37.04%) and more than half of the patentees were between 20 and 29 years old (Table 1).

Our data are comparable to that of Yasmina A et al, in Morocco in 2017 who reported an average age of 28.21 years with the extremes of 19 and 48 years.[13] By cons Esteves JS et al, in Brazil in 2015 reported an average age of 30 years with the extremes of 16 and 45 years.[15]

Aziz N et al, in the US in 2008 reported 85.8% of women under the age of 35.[16]

*Profession*

most of the patients were housewives, (37.03%), and a little more ¼ (25.92) had a liberal profession (seamstresses, dyers), the others were pupils and students 25% (Table 1). In Ethiopia Natnael E et al find that more than half of the cases and controls were housewives.[17]

*Parity*

This was in almost half of the cases (47.37%) of the pauciparous followed by the primiparous with a proportion of 30.56% (Table 1).

Aziz N et al, in the USA in 2008 reported 57% multiparous versus 43% nulliparous.[16]

Zeraïdi N et al, in Morocco reported that almost 50% of RPMs occurred in multiparous women.[18]

Frenette P et al, in Canada in 2013 reported 50% of multiparous.[19]

It emerges from this study that primiparity remains a risk factor for RPM.

***Admission circumstances and characteristics of pregnancy***

*Circumstance of reception*

More than half of the patients (52.78%) are evacuated or referred from peripheral centers. The rest came directly from their home.

It emerges from this study that RPM does not only concern pregnant or evacuated pregnant women, but even women leaving their home are affected.

*Gestational age at admission*

Most patients carried term pregnancies (84.26%) otherwise between 37 and 42 weeks. However, 9.26% had their premature rupture of the membranes in the period of prematurity, which is likely to worsen the fetal prognosis (Table 2).

Ashwal E et al, in Israel in 2016 reported an average gestational age of 39 SA with the extremes of 38 and 40 SA.[14] In contrast, Frenette P et al in Canada in 2013 reported a mean gestational age of 32SA at the time of the RPM.[19] This result could be explained by the facts that the risk of RPM is higher after 37 SA.

*Type of pregnancies*

Almost all pregnant 103/108 cases or 95.37% carried a single pregnancy against 4.63% (5 cases) of twin pregnancies (Table 2).

*Presentation of the fetus*

More than 2/3 of the patients had a cephalic presentation, ie 80% followed by that of the seat with a proportion of 16% (Table 2). Yasmina A et al, in Morocco in 2017 reported 20% of abnormal presentation.[13]

***Management***

After the reception of the patients several behaviors were held to improve the maternal and fetal prognosis of the patients. Thus, all patients received antibiotic therapy (100%), as a first-line treatment to avoid the onset of an infection that could worsen the prognosis. On the other hand, the clinical picture at the reception, hospitalization for most patients is 52.78%. The other behaviors were the realization of a cesarean section for 37.96% or the decision to give birth to the woman according to the clinical picture, the term of the pregnancy and the Bishop score (Table 3).

This prescription for prophylactic antibiotic therapy has been described by several authors: in Morocco in 2017, Yasmina A et al, in turn reported 100% prescription of antibiotics.[13]

The risk of infection is high in the event of RPM, which would explain the systematic start of antibiotic therapy in accordance with the recommendations.

In Canada in 2013, Frenette P et al, reported 57% of corticosteroid prescriptions.[19]

In India, Jigyasa S et al, report that most of their 56 patients (54.36%) had delivered by caesarean section and that less than half (45.63%) of the patients had delivered vaginally.[20]

Zeraïdi N et al, in Morocco vaginal delivery without intervention was possible in 280 parturient women (58.3%).[18] Cesarean section was performed in 45 women (9.6%). Frenette P et al, in Canada in 2013 reported 72.4% vaginal delivery versus 27.6% cesarean section.[19]

***Maternal and fetal prognosis***

*Maternal diagnosis*

In our study, more than 2/3 (84.26%) of the patients developed no complications during their hospital stay. However, some have developed complications (12.96% of chorioamniotitis and 2.78% of parietal suppuration (Table 4).

In Canada in 2013, Frenette P et al reported 1.4% chorioamniotitis.[19] Zeraïdi N et al, in Morocco reported that maternal morbidity was mainly linked to amniotic (19.6%) and puerperal (8.3%) infections.[18]

Regarding maternal complications and the mode of delivery for 41 pregnant women who had a cesarean section, 12.04% had chorioamniotitis compared to just under 1% by vaginal route (Table 5). Choriamniotitis is a risk factor for cesarean delivery. We found a statistically significant difference between the occurrence of chorioamniotitis and cesarean delivery with a p value of 0.0030.

*Fetal prognosis*

Breathing distress was the most frequent complication with a proportion of 40.71% followed by prematurity in

12.39% of cases and cord procidence for 3.54% of cases (Table 4).

In Canada in 2013 Frenette P et al, reported 2.6% prematurity, and 1.9% neonatal infection.[19] Ashwal E et al, in Israel in 2016 reported 9.1% of neonatal complications.[14]

Establishing the link between the mode of delivery and fetal complications, the results show that, 29.20% of newborns delivered by cesarean section presented respiratory distress against 11.50% of newborns delivered by vaginal delivery (Table 6).

We also found a statistically significant link between the fetal prognosis and the appearance of discharge with a value p = 0.0030.

*Colors of amniotic fluid and fetal prognosis*

It has been found that the amniotic fluid can take several colors, either clear, yellowish or greenish. Normally the amniotic fluid is clear, this during the results shows that a little more than 50% of the patients had amniotic fluid either greenish 44.25% or yellowish 7.96%. The results also show that mothers admitted with a greenish or yellowish amniotic fluid often give birth to newborns with complications such as neonatal infections, respiratory distress (Table 7).

## CONCLUSION

This prospective study enabled us to note that RPM is frequent at the Matam municipal medical center and constitutes an obstetric emergency. The profile is that of adult women, housewives, primiparous women and often referred. It occurs more often in term pregnancies often in cephalic presentation. Management essentially consisted of antibiotic prophylaxis, fetal pulmonary maturation and childbirth. The vagina was the main mode of delivery. The maternal prognosis was dominated by chorioamniotitis. The fetal one was made of respiratory distress and prematurity.

It is essential for its prevention to ensure health education of the population in general and genital hygiene in particular, to make a coherent prenatal follow-up while putting a particular accent on the detection and the treatment of genital infections.

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