

## Premature Rupture of Membranes: Interventionist or Expectant Attitude? At the Maternity Ward of Sominé Dolo Hospital in Mopti Mali

Seydou Mariko<sup>1,2\*</sup>, Nanko S Bagayogo<sup>3</sup>, Pierre Coulibaly<sup>3</sup>, Mama K Samassekou<sup>3</sup>, Abdoulaye Traore<sup>4</sup>, Amaguiré Saye<sup>5</sup>, Mamadou Haidara<sup>6</sup>, Djibril Kassogue<sup>7</sup>, Tioukani A Thera<sup>8,9</sup>

<sup>1</sup>Department of Gynecology of the Mali Bamako Hospital

<sup>2</sup>National Center for Scientific and Technological Research Mali,

<sup>3</sup>Department of Obstetric Gynecology at Sominé Dolo Hospital in Mopti Mali

<sup>4</sup>Department of anesthesia and resuscitation of Sominé Dolo hospital in Mopti Mali

<sup>5</sup>Department of Obstetric Gynecology of the Reference Health Center of Commune IV of the District of Bamako Mali,

<sup>6</sup>Department of Obstetric Gynecology of the Reference Health Center of Kalabancoro Kati Mali

<sup>7</sup>Department of administration of the hospital of Timbuktu Mali

<sup>8</sup>Department of Obstetric Gynecology of the University Hospital Center (CHU) of Point 'G' Mali

<sup>9</sup>Faculty of Medicine and Odontostomatology of Mali (FMOS)

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\*Corresponding author: Seydou Mariko

### Abstract

### Original Research Article

**Context:** The premature rupture of membranes regardless of the term of pregnancy can compromise the outcome. The objective was to describe the management of premature rupture of membranes in the maternity unit of Sominé Dolo Hospital in Mopti. **Methods and Results:** The 12-month study from January to December 31, 2018 was conducted in the maternity ward of Sominé Dolo Hospital in Mopti. This was a prospective analytical study of the case / control survey type including 63 cases (sick) of women who had presented a premature rupture of the membranes matched to 63 controls (not sick) of pregnant women admitted just before or just after the cases. During our study period. The frequency of premature rupture of membranes in relation to all live births during our study period was 4.63% or 63 cases / 1362. Spontaneous delivery after expectation was 74.6% in the group of cases, or 47/63, against 84.1% in the group of controls, or 53/63. The onset was 11.1% in the group of cases with a p value = 0.006. Cesarean section before labor was 14.3% in the group of cases, i.e. 9/63 against 15.9% in the control group, i.e. 10/63. **Conclusion:** The management of premature rupture of membranes is discussed and our team had opted for the expectation given the high proportion of premature rupture of membranes at term in our study.

**Keywords:** Attitude, premature rupture of membranes.

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## INTRODUCTION

Premature rupture of membranes (RPM) is defined as a rupture of the water bag (amnion and chorion) before the onset of labor. Although the majority of PMRs occur after 37 weeks of amenorrhea (SA), a significant proportion occurs before this term of pregnancy [1]. This definition includes cracking of the water pocket and excludes ruptures during work. Some authors consider as premature any rupture of the membranes occurring before the onset of contractions, while for others, the diagnosis requires a minimum latency phase greater than 1 hour, 12 hours or even 24 hours, with a tendency towards a consensus of 12 time. These differences in definitions explain the variations in frequencies and reported results [2].

Due to variations in definition, the frequency of PRM varies from 3 to 18% of deliveries and it seems to be decreasing thanks to the improvement in the level of health of the populations and the greater precision of the diagnoses [4]. Before 28 weeks, RPMs are rare, from 1 to 7/1000 pregnancies, but they are serious because they add to the very prematurity and to the infectious risk the consequences of the oligoamnios, that is to say among others the pulmonary hypoplasia [4]. In practice, the rate of premature ruptures before term is 3% of pregnancies [5] and that of term ruptures before labor is 8% [7].

In Mali, premature rupture of membranes is still a frequent pathology during pregnancy. The maternities of the national hospital of point G, the CHU

Gabriel Touré and that of the Reference Health Center of commune V of the district of Bamako (CSRéf) CV report rates of 2.70% for the first two maternities and 1, 6% for that of the CSRF CV [8]. The objective of the present study would be to describe interventionist attitudes (cesarean section, induction) or expectation for the management of premature rupture of membranes.

## METHODS

The setting for our study was the maternity ward of Sominé DOLO hospital in Mopti. The obstetric gynecology service provides care for all gynecological and obstetric pathologies in the Mopti circle and the reference health centers in the region. Currently, the service is part of the “Mother and Child Pool” group, made up of Gyneco-Obstetrics and Pediatrics.

The staff of the service was composed of: three (03) obstetrician gynecologists; six (06) midwives; two (02) obstetrician nurses; three (03) maneuvers.

In addition, the service was also intended to supervise students and doctoral students from the Faculty of Medicine and Odontostomatology (FMOS) of Bamako Mali and the National Institute for Training in Health Science (INFSS) and private health schools.

Outpatient consultations were provided by physicians with the assistance of midwives and acting internally. In the end, our on-call team consisted of a gynecologist, a midwife, an obstetrician nurse and trainees in training (a doctoral student, student) as well as support staff (a laborer).

The service receives patients from the city of Mopti and surrounding areas as well as patients referred from community health centers (CSCOM) and CS Refs from other circles in the region.

This was an analytical prospective of the case / witness survey type that took place over a 12-month period from January 1, 2017 to December 31, 2017.

The study population consisted of pregnant women admitted to the ward during the study period.

Our sample consisted of 63 cases (sick) matched to 63 controls (non-sick). The inclusion criteria were for Cases, all women who presented with premature rupture of membranes during the study period and who gave birth in the ward and controls, pregnant women who did not present with premature rupture of membranes and who had consulted just before or just after cases and recorded in the service's admissions register. The non-inclusion criteria were for cases, pregnant women with RPM diagnosed in our department and having given birth in other departments and controls, all pregnant women in whom the diagnosis of premature rupture of membranes was not invalidated by our examination clinical. The variables taken into account were: the dependent variables = Cesarean section, induction and expectation and the independent variables: age, profession, level of study, term of pregnancy, maternofetal prognosis, antenatal consultations.

For data collection, an individual questionnaire was established and completed by an investigator from reading the obstetric records, the prenatal consultation booklet, the delivery register, the cesarean section register, the obstetric emergency register. The data were entered on Microsoft Word 2016 software and analyzed on SPSS version 21 software. We determined the odds ratio with its 95% confidence interval (CI). The values of  $p < 0.05$  were retained as statistically significant.

During this study, we had been confronted with some difficulties such as, Impossibility of some women to make the biological assessment because of the cost factor,

## RESULTS

In total from January 1 to December 31, 2017, the live births in our department were 1362 and the cases of premature rupture of membranes in our series at the same period were 63, i.e. a prevalence of 4.6% (63 cases / 1362) deliveries. The age group of 20 to 24 years was the most represented in our series and of a higher proportion in the group of cases compared to the controls, i.e. 36.5% against 19% with OR = 2.44, 95% CI 2, 44 [1.09 - 5.50].

**Table-1: Distribution of pregnant women by age group**

Age	Catégories		P value	Odds Ratio	Confidence Interval 95% CI
	Cases (%)	Witnesses (%)			
15-19	6(9,5)	16(25,4)	0,019	0,31	[0,11 – 0,85]
20-24	23(36,5)	12 (19,0)	0,029	2,44	[1,09 – 5,50]
25-29	9(14,3)	18 (28,6)	0,051	0,42	[0,17 – 1,02]
30-34	10 (15,9)	10 (15,9)	1,000	1,00	[0,39 – 2,60]
35-39	14(22,2)	4(6,3)	0,011	4,21	[1,30 – 13,63]
40-44	1(1,6)	2 (3,2)	0,559	0,49	[0,04 – 5,57]
≥ 45	0 (0,0)	1(1,6)	0,315	0,00	-

Housewives were 58.7% in cases versus 69.8% of controls with an OR = 0.62. Uneducated women were the most numerous in the two groups, ie 34.9% in

cases against 36.5% in controls with OR = 0.93. Women who had performed three antenatal consultations and more were the most represented in

both cases and controls, i.e. 61.9% against 65.5% with

OR = 0.87.

**Table-2: Distribution of pregnant women according to the number of antenatal consultations (ANC)**

ANC	Catégories		P value	Odds Ratio	Confidence Interval 95% CI
	Cases (%)	Witnesses (%)			
1-2	17(27,0)	10(15,9)	0,129	1,96	[0,81 – 4,70]
3 and more	39(61,9)	41(65,1)	0,711	0,87	[0,42 – 1,80]
Not done	7(11,1)	12(19,0)	0,213	0,53	[0,19 – 1,45]

In our series, pregnancies at 37 weeks of amenorrhoea and more constituted the bulk of our

sample (65.1% in cases against 73.02% in controls with OR = 0.69).

**Table-3: Distribution of pregnant women according to the age of pregnancy**

Age of pregnancy	Catégories		P value	Odds Ratio	Confidence Interval 95% CI
	Cases (%)	Witnesses (%)			
Unknown	6(9,5)	13(20,6)	0,081	0,41	[0,14 – 1,15]
≥ 37NT	41(65,1)	46(73,0)	0,335	0,69	[0,32 – 1,47]
28– 36NT	16(25,4)	4(6,5)	0,003	5,02	[1,57 – 16,03]

According to our management attitude, spontaneous (expectant) labor was the most represented in our series in both cases and controls with 74.6% and 84.1% OR = 0.55, respectively. The cesarean section

rates before the onset of labor in our study were similar in the two groups, i.e. 14.3% in cases versus 15.9% in controls. In the end artificial induction of labor was 11.1% in cases versus nothing in the control group.

**Table-4: Distribution of pregnant women according to our care attitude**

Mode of entry into labor	Catégories		P value	Odds Ratio	Confidence Interval 95% CI
	Cases (%)	Witnesses (%)			
Spontaneous work	47(74,6)	53(84,1)	0,187	0,55	[0,23 – 1,34]
Trigger	7(11,1)	0(0,0)	0,006	-	-
Cesarean section before labor	9(14,3)	10(15,9)	0,803	0,88	[0,33 – 2,35]

Prematurity was the main fetal complication in cases with OR = 4.71. We noted 1 case of

chorioamnionitis and cord prolapse in the cases, ie 1.6%.

**Table-5: Distribution of pregnant women according to the maternofetal prognosis**

Complications	Catégories		P value	Odds Ratio	Confidence Interval 95% CI
	Cases (%)	Witnesses (%)			
Prematurity	12(19,0)	3(4,8)	0,013	4,71	[1,26 – 17,60]
Fetal death	3(4,8)	3(4,8)	1,000	1,00	[0,19 – 5,15]
Fetal macrosomia	6(9,5)	3(4,8)	0,299	2,11	[0,50 – 8,82]
Fetal hypotrophy	5(7,9)	1(1,6)	0,094	5,35	[0,61 – 47,13]
Neonatal suffering	8(12,7)	5(7,9)	0,380	1,69	[0,52 – 5,47]
Maternal complications					
Cesarean	23(36,5)	24(38,1)	0,854	0,93	[0,45 – 1,92]
Chorioamnionitis	1 (1,6)	0(0,0)	0,315	-	-
Cord proci-dence	1 (1,6)	0(0,0)	0,315	-	-

## DISCUSSION

During the 12 months of the investigation, from January 1, 2017 to December 31, 2017, we recorded 1362 deliveries at the maternity ward of Sominé Dolo Hospital in Mopti, including our 63 cases and 63 witnesses. Premature rupture of membranes was represented in our series by 4.6%, ie 63 cases / 1362 deliveries. This frequency is higher than those reported by studies carried out in Mali, ie 0.9% according to

Keita M A [19]; 2.5% according to Samake.A [25] and 2.8% according to Keita. N [26].

This high frequency is explained by the fact that Sominé Dolo Hospital was the only health structure competent for the resuscitation of newborns in the Mopti district.

The age group of 20 to 24 years was the most represented in our series and of a higher proportion in the group of cases compared to controls, i.e. 36.5%

against 19% with OR = 2.44 95% CI 2.44 [1.09 - 5.50] with a statistically significant association. The extreme ages were 17 and 42. Teenage girls represented 9.5%. However, this result contrasted with those reported by Keita MA [19] and Cissé K [20] who had recorded 72.4% of pregnant women in an age group between 20-35 years old, respectively, with 13.8% of pregnant women. Adolescent girls; and 71.4% of pregnant women aged between 19-35 years, with 18.1% of adolescents. The way we categorize the age range could and the size of our sample could partly explain our low rate.

The majority of pregnant women 58.7% were housewives in the cases, without a statistically significant difference compared to controls ( $p = 0.193$ ). This result is lower than those reported by Cissé K [20] with 73.7% and Traore A L [21] with 69.1% and higher than that of Samake.A [25] with 45%. We note that housewives were the most exposed to premature rupture of membranes in our study. Out-of-school pregnant women were the most represented with 34.9% in cases and 36.9% in controls without a statistically significant difference between cases and controls ( $P > 0.05$ ).

The low enrollment rate (34.9% in the uneducated cases against 36.5% in the uneducated controls) was a major problem in the monitoring of pregnancy because it could have impacted on the understanding and the proper conduct of the monitoring of the pregnancy. This rate was confirmed by Keita M A [19]: 85.3% of pregnant women not attending school, Cissé K [20]: 55.6% of pregnant women not attending school, Samake.A [25]: 32% of pregnant women not attending school. We noted in our series that 65.1% pregnant with premature rupture of membranes carried a pregnancy a priori to term but there was no statistical difference with the controls ( $P = 0.335$ ). This high rate of premature rupture of membranes at term agreed well with the data in the literature which states that premature ruptures at term are the most frequent [1]. However, this rate was lower than those of Boog G and Mirlesse V [22] who found 60 to 80% and 80% of cases of RPM at term, respectively, Samake.A [25] found 82% of cases of RPM at term. In our study, we achieved 74.6% spontaneous induction of labor within hours of premature rupture of membranes. This result is superior to that of Samake.A. [25] and lower than that of Keita N. [26] who found 70% and 83% spontaneous induction of labor, respectively, within hours of premature rupture of the membranes. The high rate of spontaneous labor is physiological since the RPM causes the release of prostaglandins from the amniotic fluid which would act on the cervix (ripening of the cervix), by stimulation due to the endogenous prostaglandin E2 secretion, resulting in the post pituitary secretion of oxytocin via endogenous prostaglandins. 74.6% of women reportedly went into labor spontaneously within 48 hours after rupture of the water bag [19]. However, we

proceeded to initiate labor artificially in 11.1% of cases. This could be explained by the absence of spontaneous labor in some pregnant women and the favorable local obstetric conditions. Cesarean section before labor was performed in 14.3% in cases against 15.9% in controls without a considerable statistical difference. The explanation would be related to the maternal-fetal complications of RPM in our study [Table 5]. of pregnant women according to the maternofetal prognosis

The fetal prognosis was hampered by significant fetal morbidity and mortality. Thus in our study we had recorded 53.9% of complications, that is to say 19% of prematurity, 12.7% of fetal distress, 4.8% of stillbirths, 7.9% of fetal hypotrophy. This significant morbidity and mortality was mainly found in cases of prolonged PRM of more than 3 days. Our fetal mortality rate was 4.8% and at the same time relatively high rates were observed by other authors in developed countries [28-30].

The maternal prognosis was mostly good. The indications for cesarean section in our series were mainly related to PRM on a scarred uterus and fetal macrosomia.

## CONCLUSION

At the end of our study, we will retain that PPR is a frequent condition in obstetrics. The support for RPM is not unequivocal. Decision-making depends on certain factors: gestational age, obstetric conditions, whether or not there is a maternal or fetal infection. In our specific case, the onset of RPM at 37 weeks of amenorrhea and more influenced our decision making in favor of expectation.

## Conflicts of interest

The authors declare no conflict of interest.

## Contributions from the authors

Pierre Coulibaly and Tioukani A Théra designed the study. The methodology of the study was adopted by Tioukani A Théra, Seydou Mariko, and Nanko S Bagayogo. Data collection and analysis was carried out by Mama K Samassekou, Seydou Mariko. At the end of Amaguiré Saye, Mamadou Haidara, Djibril Kassogué and Abdoulaye Traoré revised the article until it was submitted for publication.

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