**Orginal article**

# The Role of Antibiotics Therapy on Maternal Complication in Women with Premature Rupture of Membranes

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**Abstract:**

**Introduction**: Rupturing of fetal membranes before week 37 is called preterm premature rupture of membranes (PPROMs). The pathogenesis of PPROM is not definite but it seems that many mechanical and physiological etiologies are involved. As the most important risk factors, having a late history of the same disease, genital infection, prepartum bleeding and smoking can be named. Premature rupture of the membranes is usually seen in preterm births and it accounts for about 1/3 of them.

**Methods**: This interventional semi experiencing study was done on patients visiting the Sayyad Shirazi hospital in Gorgan with a chief complaint of leaking fluid in week 24 up to 34 of pregnancy. Noticeable neonatal complications in this study were birth time Apgar, admission in NICU, birth weight and IUGR. All of the neonates entered the study with a gestational age of fewer than 34 weeks and admitted with a diagnosis of probable sepsis. Neonates with congenital abnormalities, asphyxia, respirational distress syndrome, meconium aspiration syndrome and birth weight less than 1000 gram exited the study. Data was analyzed with SPSS16 statistical software and Chi2 test, independent T-test and ANOVA.

**Findings**: Admission length time until labor in the group that did not receive antibiotics was less than the other group and average admission length time between the two groups was statistically meaningful (P=0.00). In the Group that received antibiotics, on order 25, 50 and 75 percent of patients had admission length time of 7, 4 and 12 days and these percentages for the other group are 5, 3 and 7 days. Also, there was not any significance difference between the other two variables, which are the type of labor and fever frequency, and chorioamnionitis.

**Conclusion:** According to the results, usage of antibiotics lengthens the late stage of labor and it is probably effective in decreasing the premature neonate complications. Therefore using of antibiotics in

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premature rupture of amniotic fluid is suggested.

**Keywords**: maternal, PPROM, Premature

## Introduction:

Rupturing of fetal membranes before week 37 is called preterm premature rupture of membranes (PPROMs). The pathogenesis of PPROM is not definite but it seems that many mechanical and physiological etiologies are involved. As the most important risk factors, having a late history of the same disease, genital infection, prepartum bleeding and smoking can be named. Premature rupture of the membranes is usually seen in preterm births and it accounts for about 1/3 of them. Not only PPROM has fetal complications, but also it has maternal complications too [1]. These complications are more common in PPROMs of before week 34 [2]. Clinical infection inside the amniotic fluid, endometrial infection, and sepsis in the mother are noticeable [3]. Fetal complications are directly related to the gestational age when the membranes have ruptured. Preterm premature rupture of the amniotic sac can increase the mortality of before birth,- up to four times and causes 3 times increased of neonatal disabilities [4].

In many studies, the usage of antibiotics with limited effect spectrum such as amoxicillin and ampicillin are suggested [5]. There are many conflictions between doctors in expecting treatment versus interventional treatment, tocolytics usage, periods of antibiotic therapy, and time of using glucocorticoids before labor, methods of defying the amount of mother and fetus infection and labor itself in managing PPROM [6]. According to the controversies in approach to the patients with PPROM before week 34 and the probability of maternal and fetal complications, we decided to study this topic in visitors at Sayyad Shirazi hospital in Gorgan.

## Methods:

This interventional semi experiencing study was done on patients visiting the Sayyad Shirazi hospital in Gorgan with a chief complaint of leaking fluid in week 24 up to 34 of pregnancy. In order to be sure about the rupture of membranes, physical examination, and nitrazine test were performed. At the beginning of the study, after ensuring the rupture of fetal membranes, patients were admitted and then Rectovaginal GBS culture was done for all of the patients and after that 2-mg of intravenous ampicillin, every 6-hour and 1 gram of azithromycin (single dose) prescribed. After 48 hours, with determining the results of culture, GBS infected mothers undergone treatment and exited the study. If the test result was negative, then they entered the study. All of the patients after entering the study were matched for gestation ages. Also, the gynecologist gave information to the patients about the study, prescribed drugs, probable complications, and labor progress and a written testimony was taken. Any time they did not willing to continue the study they could exit. With considering the level of assurance of 95% and power of 80%, final sample size defined as 70 people. Patients divided into two groups. One group underwent treatment with amoxicillin one capsule 500mg every 8-hour until labor time and the other group left without antibiotic therapy and was observed.

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Noticeable neonatal complications in this study were birth time Apgar, admission in NICU, birth weight and IUGR. All of the neonates entered the study with a gestational age of fewer than 34 weeks and admitted with a diagnosis of probable sepsis. Neonates with congenital abnormalities, asphyxia, respirational distress syndrome, meconium aspiration syndrome and birth weight less than 1000 gram exited the study. Data was analyzed with SPSS16 statistical software and Chi2 test, independent T-test and ANOVA.

## Findings:

The average age was 27.76 with a maximum of 41 years, and a minimum of 18. For both groups, the vaginal examination was performed and the results are reported in Table 1. After that, both groups were compared according to the variables such as admission length time until labor, type of labor performed and fever or chorioamnionitis (Table 2). Admission length time until labor in the group that did not receive antibiotics was less than the other group and average admission length time between the two groups was statistically meaningful (P=0.00). In the Group that received antibiotics, on order 25, 50 and 75 percent of patients had admission length time of 7, 4 and 12 days and these percentages for the other group are 5, 3 and 7 days. Also, there was not any significance difference between the other two variables, which are the type of labor and fever frequency, and chorioamnionitis.

On the other hand number of admitted neonates in NICU in the received group (69%) was less than the group that did not receive antibiotics (87%) which have a statistically meaningful difference (P=0.020). Also, birth weight in the group that received antibiotics was more than the other group (P=0.014) (Table 3).

## Discussion:

PPROM is one of the most common obstetric complications and the most important difficulties in pediatrics, which puts the mother, and the fetus in danger and it counts as important causes of mortality in neonates. Despite its high incidence, there are not enough studies available to it[7]. PPROM is accompanying the shortening stage of late labor and becoming infected. Although there are multiple causes for PPROM it seems that infections play a significant role in here [8-11].

In this study after equalizing both groups, a number of pregnancies and average gestational age both were according to the normal distribution (P<0.0001) and the differences between them was not statistically meaningful. There was no statistical difference between variables of the type of labor and fever and chorioamnionitis frequency, which confirmed by Segel, and his co-workers [12] and in their study, there was no meaningful difference between the two groups in getting chorioamnionitis.

In a study, it was indicated that usage of antibiotics causes a decrease in chorioamnionitis and complications with fever after labor which is paradoxical to our study [13]. Also, Maymon and his colleagues figured out that in the receiving group, there was less amount of clinical chorioamnionitis and endometritis which our study doesn't confirm these results although this can be caused by the difference in sample size and also the type of the used antibiotics.[11] Kenyon and his colleagues indicated that

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prescribing antibiotics causes an increase in pregnancy length and on the other hand it increases mortality and morbidity in mothers and neonates, which was supported by our study [14].

It should be said that birth weight in our study in the receiving group was more than the other group and this is in contrast to Sadri study, which indicated no difference between birth weight and Apgar number of neonates in both groups [15]. These differences in our results and other studies can be caused by the different age of pregnancies, prescribing different antibiotics and different treatment periods in other studies.

## Conclusion:

According to the results, usage of antibiotics lengthens the late stage of labor and it is probably effective in decreasing the premature neonate complications. Therefore using of antibiotics in premature rupture of amniotic fluid is suggested.

## Conflicts of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

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## Tables and Charts:

**Table 1: a** Cervical condition in both groups according to a vaginal exam.

| | **1 Finger** | **2 Finger** | **Tip finger** | **Ext 1 finger** | **1 Finger loose** | **Closed cole** |
|---|---|---|---|---|---|---|
| **Receiving Group** | 20(28.6%) | 3(4.3%) | 12(17.1%) | 8(11.4%) | 10(14.3%) | 17(24.3%) |
| **Not Receiving Group** | 28(34.3%) | 9(12.9%) | 17(24.3%) | 8(11.4%) | 4(5.7%) | 4(5.7%) |
| **Overall** | 48(34.3%) | 12(8.6%) | 29(20.7%) | 16(11.4%) | 16(10%) | 21(15%) |

**Table 2:** Comparing of admission length time until labor, type of labor, fever, and chorioamnionitis in two groups.

| **P Value** | **Not Receiving Group** | **Receiving Group** | **Variable** |
|---|---|---|---|
| 0.000 | 5.12 ± 2.2 | 8.04 ±4.2 | **Admission length time until labor** |
| | 36(51.4%) | 44(63.8%) | **Type of labor** |
| 0.336 | 21(30%) | 15(21.7%) | **Normal** |
| | 13(18.6%) | 10(14.5%) | **Cesarean** |
| | | | **Fever and Chorioamnionitis** |
| 0.730 | 4(7.5%) | 5(7.1%) | **Positive** |
| | 66(94.3%) | 65(92.9%) | **Negative** |

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**Table 3:** Comparing of NICU admission, birth weight, Apgar number, IUGR in neonates in the two groups.

| P Value | Not Receiving Group | Receiving Group | Variable |
|---|---|---|---|
| 0.014 | 1729.14g ± 359.40 | 1879.57g ± 354.45 | **Birth Weight** |
| 0.301 | | | **IUGR Neonate** |
| | 6(8.6%) | 3(4.3%) | **Yes** |
| | 64(91.4%) | 67(91.4%) | **No** |
| 0.020 | | | **NICU Admission** |
| | 60(85.7%) | 49(69.1%) | **Yes** |
| | 10(14.3%) | 21(30.9%) | **No** |
| 0.555 | 7.31 ± 0.8 | 7.41 ± 1.16 | **Min 1 Apgar** |
| 0.354 | 8.67 ± 0.5 | 8.77 ± 0.74 | **Min 5 Apgar** |

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