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Histologic chorioamnionitis prevalence in patients with premature rupture membranes

T. Fukami, M. Goto, S. Matsuoka, S. Nishijima-Sorano, A. Tohyama, H. Yamamoto, S. Nakamura, R. Matsuoka, H. Tsujioka, F. Eguchi

Department of Obstetrics and Gynecology, ASO Iizuka Hospital, Iizuka, Fukuoka (Japan)

Summary

This was a retrospective cohort study between 2002 and 2011. A total number of 150 singleton pregnancies with preterm premature rupture of membranes (PROM) (before 34 weeks) were analyzed. Histological chorioamnionitis (Blanc grade III) was significantly increased over three days from onset of premature rupture of membranes. The positive relationship was strengthened (odds ratios, 3.5; 95% confidence intervals, 1.5–5.2) over three days from onset of preterm PROM. PROM is a risk factor important for histological chorioamnionitis. To avoid neonatal infection, early termination is recommended in preterm PROM patients.

Key words: Premature rupture of membranes; Chorioamnionitis; Placenta.

Introduction

Preterm premature rupture of membranes (preterm PROM) causes one-third of preterm births and contributes to significant perinatal morbidity and mortality [1-4]. Microbial invasion of the amniotic cavity is found in about 30% of preterm PROM cases, and is associated with earlier gestational age at delivery [5-12]. When characteristic clinical signs are present, the condition is referred to as clinical chorioamnionitis or clinical intraamniotic infection. Although there is significant overlap between clinical and histologic chorioamnionitis, the latter is a more common diagnosis based on pathologic findings on microscopic examination of the placenta that encompasses sub-clinical chorioamnionitis as well as clinical chorioamnionitis. Overall the definition of chorioamnionitis varies according to key diagnostic criteria, which can be clinical, microbiologic or histopathologic. Overall, 1–4% of all births in the United States are complicated by chorioamnionitis [13]; however, the frequency of chorioamnionitis varies markedly by diagnostic criteria, specific risk factors, and gestational age [14-18]. The main preventative strategy is administration of antibiotics to women with preterm PROM which reduces the incidence of clinical chorioamnionitis, prolongs the time to delivery and improves neonatal outcomes. Optimal management of clinical chorioamnionitis includes antibiotic therapy and delivery. Here, the authors will investigate the relationship between the duration of PROM and chorioamnionitis (Blanc grade III).

Materials and Methods

Subjects

Four-thousand sixty-seven infants were born at the present hospital from January 2002 to December 2011. This study included preterm PROM from 22 weeks zero days to 33 weeks and six days, singleton pregnancy. After excluding with multiple pregnancy, preterm PROM occurred before 21 weeks and six days and stillbirth; the remaining 150 singletons were analyzed.

An experienced pathologist, blinded to infant and clinical outcomes, reviewed hematoxylin-and-eosin-stained slides for histological chorioamnionitis [22]. Histological chorioamnionitis included inflammation of the chorionic membrane, free membrane chorioamnionitis, subchorionitis, and chorionitis.

In the present facility, antenatal corticosteroids for the purpose of acceleration of lung maturation were routinely given by 33 weeks of gestation if there were not any signs of clinical CAM. Antibiotics were given at premature rupture of membranes.

Statistical analyses

Logistic regression analysis was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs). Multiple logistic regression analysis was used to control the potential confounding effects of selected factors. Two-sided p values less than 0.05 were regarded as statistically significant. All analyses were performed by the PC-SAS software package version 9.1.

Results

Ninety cases (60.0%) of neonates were born within three days from onset of preterm PROM, 14 cases (9.3%) were born three to seven days. and 46 cases (30.7%) were born over seven days (Figure 1A). Histological chorioamnionitis (Blanc grade III) was significantly increased over three days from onset of PROM (Figure 1B, Table 1), affecting 28 pa-

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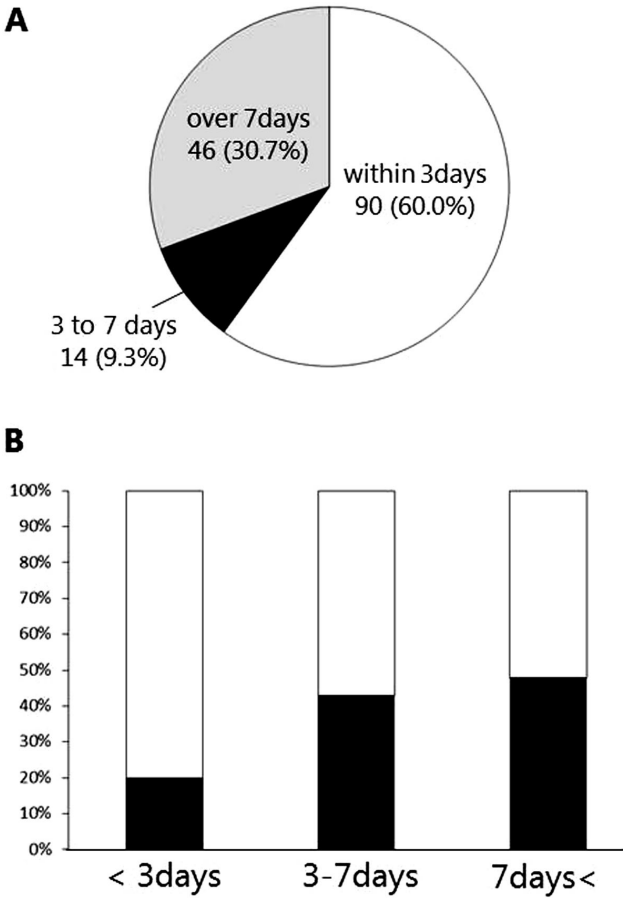

Figure 1. — A: Distribution of duration from onset of PROM to delivery. B: Prevalence of chorioamnionitis.

tients in 60 cases (46.7%). ORs and their 95% CIs for the relationship between the duration of PROM and chorioamnionitis (Blanc grade III). The positive relationship was strengthened (ORs, 3.5; 95% CI, 1.5–5.2) over three days from onset of preterm PROM.

Discussion

Chorioamnionitis (clinical and histologic combined), complicates as many as 40–70% of preterm births with premature membrane rupture or spontaneous labor [19]. Chorioamnionitis is a common infection of pregnancy, typically occurring in the setting of prolonged membrane rupture or labor. It may be diagnosed clinically based on signs such as maternal fever, microbiologically based on amniotic fluid culture obtained by amniocentesis, or by histopathologic examination of the placenta and umbilical cord. Chorioamnionitis is associated with postpartum maternal infections and potentially devastating fetal complications including premature birth, neonatal sepsis, and cerebral palsy [20, 21]. Adverse associations between prenatal and neonatal infection and brain damage in preterm infants have been reported [22]. The association between histological chorioamnionitis and neurodevelopmental outcomes of infants is varied in the literature. The relationship between histological chorioamnionitis and a decreased mental developmental index score at 18 months has also been reported [23]. Another study reported an association between cerebral palsy and histological chorioamnionitis [24].

Table 1. — *Prevalence of chorioamnionitis.*

PROM to delivery	Case number	Blanc grade III
Within three days	90	18 (20.0%)
Three to seven days	14	6 (42.9%)
Over seven days	46	22 (47.85%)

The prevalence of chorioamnionitis increased according to longer periods from onset of premature PROM. In the present hospital, antenatal corticosteroids injection for acceleration of lung maturation were routinely given by 34 weeks of gestation. After antenatal corticosteroids injection, the present authors enforced termination of pregnancy with preterm PROM to prevent chorioamnionitis and continuing neonatal infection.

Conclusion

To avoid neonatal infection, early termination is recommended in preterm PROM patients.

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Corresponding Author:
T. FUKAMI, M.D., Ph.D.
Department of Obstetrics and Gynecology
ASO Iizuka Hospital
3-83 Yoshio-machi, Iizuka
Fukuoka 820-8505 (Japan)
e-mail: fukami1975@msn.com