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Editorial

Early and late preterm premature rupture of membranes

The premature rupture of membranes (PROM), defined as rupture of the amniotic membranes before the onset of labor, remains a serious challenge for obstetricians, because of its high rate of comorbidity, including infection, cesarean section, and other associated problems.[1] Preterm PROM (PPROM) (occurring before the 37 full gestational weeks), accompanied by preterm birth, is the leading cause of morbidity and mortality in the neonatal period.[2,3] The etiology of PROM and PPROM is multifactorial, but there now exists abundant evidence that localized or systemic infection and/or inflammation is one of the most important causative factors.[4] The presence of vaginal infection is reported to be associated with an increased risk for PROM and PPROM.[5] Management of pregnant women with or at risk for PROM and PPROM is still one of the most important issues in obstetrics practice, which is codified by international guidelines and influenced by gestational age and the presence of complicating factors including clinical infection, placenta abruption, labor, or nonreassuring fetal status.[1] Unfortunately, strategies for prevention of PROM appear to be controversial based on inconsistent supporting evidence.[5] Therefore, it is encouraging to learn that Chandra and Sun's study published in this issue of the *Journal of the Chinese Medical Association* investigated this topic.[6]

The authors enrolled 714 pregnant women with third trimester PROM and PPROM (577 women with PROM, 116 with late PPROM at $32-36^{+6}$ weeks, and 21 women with early PPROM, < 32 weeks' gestation) in the Jiangsu Province Hospital between January and December 2015, to study maternal characteristics and pregnancy outcomes.[6] The authors found that breech presentation and history of previous cesarean section was associated with occurrence of PPROM compared to that of PROM (9.5% vs. 1.9% and 14.6% vs. 4.7%, respectively; both $p < 0.01$).[6] In addition, high C-reactive protein levels and high maternal temperature were also found in the pregnant women with PPROM, suggesting that these indicate asymptomatic infection.[6] Therefore, they suggested that this condition requires close monitoring to prevent adverse effects on pregnancy. Finally, they found that longer latency period in the PPROM group is predictable, and it is important to prolong the gestational age in PPROM patients.[6] This study confirmed that accurate assessment of gestational age and understanding of the maternal, fetal, and neonatal risks are essential to appropriate evaluation, counseling, and care of patients with PROM and PPROM.[1] This article is interesting and worthy of discussion.

First, it was unfair to enroll the pregnant women with PROM in Chandra and Sun's study. One trial revealed that for 50% of women with PROM who were managed with an expectation of delivery within 5 hours, 95% of those patients delivered within 28 hours.[7] The meta-analysis data (6814 pregnant women with PROM at 37 weeks of gestation or more) indicated that these pregnant women benefitted from induction of labor compared with expectant management, based on the findings that induction of labor reduced the time to delivery and the rates of chorioamnionitis, endometritis, and admission to the neonatal intensive care unit, without increasing the rates of cesarean section or operative vaginal delivery.[8]

Second, the optimal gestational age for delivery is unclear and controversial in pregnant women with PPROM,[1] especially for those patients with late PPROM.[1] The definition of late preterm birth often ranges from 34 weeks' to 37 weeks' gestation.[9] It is unusual to use 32 weeks' gestation as a cutoff value, as shown by Chandra and Sun.[6] For example, recent new information from a meta-analysis and randomized controlled trials evaluated delivery versus expectant management between 34 weeks' and 37 weeks' gestation (late preterm birth) also failed to show a significant difference between the two groups.[10,11] Analysis of the cost-effectiveness of the randomized controlled trial of preterm prelabor rupture of the membranes near term found that there was no significant difference between immediate birth and expectant management.[12] Based on the above-mentioned findings, we might conclude that expectant medical management might be the better choice for women with late PPROM, and that induction of labor might be a superior choice for women with PROM. Unfortunately, Chandra and Sun did not provide any new information for us in this regard.

Third, Chandra and Sun suggested monitoring for asymptomatic infection and longer latency period for PPROM to minimize perinatal morbidity and mortality. Of course, it is gratifying to learn that research studies have focused on more accurate clinical and/or microbiological surveillance systems, validated risk stratification strategies, and better point-of-care

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testing for women with early PPROM (< 34 weeks' gestation), to offer improved intervention to minimize the risk of maternal and fetal morbidity and mortality. Unfortunately, Chandra and Sun provided little information in this regard.[6] In addition, the following concepts are clear indications for delivery, such as nonreassuring fetal status, clinical chorioamnionitis, and significant placental abruption.[1] Chandra and Sun also missed this important point.

Finally, Chandra and Sun did not perform routine culturing for patients with PPROM, and they also failed to mention any Group B *Streptococcus* (GBS) screening. GBS screening is a highly recommended procedure for pregnant women, and vaginal macrobiotics is an important issue for preterm births.[13−15] The recent clinical management guidelines from the American College of Obstetricians and Gynecologist for obstetricians and gynecologists recommend the following to reduce maternal and neonatal infection and gestational-age-dependent morbidity: (1) a 7-day course of combination therapy of intravenous ampicillin and erythromycin followed by oral amoxicillin and erythromycin in women with early PPROM; (2) a single course of corticosteroids; (3) the needs of intrapartum GBS prophylaxis; and (4) at risk of imminent delivery, magnesium sulfate might be used for fetal neuroprotection.[1]

Conflicts of interest

The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

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References

1. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Obstetrics, et al. Practice Bulletin No. 172: Premature rupture of membranes. *Obstet Gynecol* 2016;**128**:e165−77.
2. Yeh CC, Chen CY, Wang PH. Infection and preterm birth. *J Chin Med Assoc* 2017;**80**:530−1.
3. Wang PH, Yeh CC, Chen YJ, Chen CP. Maternal serum markers and preeclampsia. *Taiwan J Obstet Gynecol* 2015;**54**:339−40.
4. Nadeau HC, Subramaniam A, Andrews WW. Infection and preterm birth. *Semin Fetal Neonatal Med* 2016;**21**:100−5.
5. Lamont RF. Advances in the prevention of infection-related preterm birth. *Front Immunol* 2015;**6**:566.
6. Chandra I, Sun L. Third trimester preterm and term premature rupture of membranes: Is there any difference in maternal characteristics and pregnancy outcomes? *J Chin Med Assoc* 2017;**80**:657−61.
7. Hannah ME, Ohlsson A, Farine D, Hewson SA, Hodnett ED, Myhr TL, et al. Induction of labor compared with expectant management for prelabor rupture of the membranes at term. TERMPROM Study Group. *N Engl J Med* 1996;**334**:1005−10.
8. Dare MR, Middleton P, Crowther CA, Flenady VJ, Varatharaju B. Planned early birth versus expectant management (waiting) for prelabour rupture of membranes at term (37 weeks or more). *Cochrane Database Syst Rev* 2006;(1):CD005302.
9. Teng SW, Lee WL, Li YT. An echo of an important but often neglected issue-late preterm births. *Taiwan J Obstet Gynecol* 2015;**54**:213.
10. Buchanan SL, Crowther CA, Levett KM, Middleton P, Morris J. Planned early birth versus expectant management for women with preterm prelabour rupture of membranes prior to 37 weeks' gestation for improving pregnancy outcome. *Cochrane Database Syst Rev* 2010;(3):CD004735.
11. van der Ham DP, Vijgen SM, Nijhuis JG, van Beek JJ, Opmeer BC, Mulder AL, et al. Induction of labor versus expectant management in women with preterm prelabor rupture of membranes between 34 and 37 weeks: a randomized controlled trial. PPROMEXIL trial group. *PLoS Med* 2012;**9**:e1001208.
12. Lorthe E, Ancel PY, Torchin H, Kaminski M, Langer B, Subtil D, et al. Impact of latency duration on the prognosis of preterm infants after preterm premature rupture of membranes at 24 to 32 weeks' gestation: a national population-based cohort study. *J Pediatr* 2017;**182**:47−52. e2.
13. Wang KC, Wang PH. *Lactobacillus* supplementation and Group B *Streptococcus* infection. *Taiwan J Obstet Gynecol* 2017;**56**:121−2.
14. Lee WL, Yeh CC, Wang PH. Did self-sampling improve the adherence to group B streptococci screening in pregnant women? *J Chin Med Assoc* 2016;**79**:51−3.
15. Lee WL, Wang PH. Lactobacillus and lower genital tract infection. *J Chin Med Assoc* 2017;**80**:5−6.

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