

Correlation of Residual Amniotic Fluid and Perinatal Outcomes in Periviable Preterm Premature Rupture of Membranes

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Abstract

Objective: To correlate maternal and fetal outcomes of pregnancies affected by preterm premature rupture of membranes (PPROM) at < 24 weeks' gestational age with the amount of residual amniotic fluid as determined by sonographic evaluation.

Methods: We searched the local maternal-fetal medicine database for the records of all women with PPRM prior to 24 completed weeks of pregnancy. The quantity of residual amniotic fluid determined by ultrasound was recorded and women were separated into two groups: (A) deepest vertical pocket (DVP) ≥ 1 cm, or (B) DVP < 1 cm (severe oligohydramnios). Hospital chart review was undertaken to determine latency to delivery, perinatal death, and maternal complications. Data were analyzed using Fisher exact and Wilcoxon-Mann-Whitney U tests.

Results: We identified 31 subjects, of whom nine elected termination of pregnancy (6 in group A, 3 in group B). Six of 10 subjects in group A had a live delivery without neonatal death, whereas only one of 12 subjects in group B had a live delivery ($P = 0.020$). Additional complications included placental abruption in 63% in group A and 45% in group B, chorioamnionitis in 50% and 70%, respectively, and postpartum endometritis in 0% and 9%, respectively. None of these differences were statistically significant. There were no cases of maternal sepsis or maternal death in either group. Group A was associated with a later GA at delivery (27.5 weeks vs. 23 weeks, $P = 0.07$), with the GA at rupture of the membranes similar for both groups.

Conclusion: These results indicate that a higher level of residual amniotic fluid after periviable PPRM is associated with fetal survival and increased latency to delivery without an increase in maternal complications. This information will be valuable in counselling pregnant women with PPRM < 24 weeks.

Key Words: Periviable preterm premature rupture of membranes, amniotic fluid, perinatal survival

Competing Interests: None declared.

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Résumé

Objectif : Chercher à établir une corrélation entre les issues maternelles et fœtales de grossesses affectées par la rupture prématurée des membranes préterme (RPMP) à un âge gestationnel < 24 semaines et la quantité de liquide amniotique résiduel déterminée par évaluation échographique.

Méthodes : Nous avons mené des recherches dans la base de données locale de médecine fœto-maternelle afin d'en tirer les dossiers de toutes les femmes ayant présenté une RPMP avant 24 semaines complètes de grossesse. La quantité de liquide amniotique résiduel déterminée par échographie a été consignée et les femmes ont été réparties en deux groupes : (A) poche verticale la plus profonde (PVP) ≥ 1 cm ou (B) PVP < 1 cm (oligohydramnios grave). Une analyse des dossiers hospitaliers a été menée afin de déterminer le délai avant l'accouchement, la présence d'un décès périnatal et la survenue de complications maternelles. Les données ont été analysées au moyen du test exact de Fisher et du test de Wilcoxon-Mann-Whitney U.

Résultats : Nous avons identifié 31 sujets, neuf desquels ont choisi l'interruption de grossesse (6 du groupe A, 3 du groupe B). Six sujets du groupe A sur 10 ont donné lieu à une naissance vivante sans décès néonatal, tandis que cela n'a été le cas que chez un sujet du groupe B sur 12 ($P = 0,020$). Parmi les complications additionnelles, on trouvait le décollement placentaire chez 63 % des sujets du groupe A et 45 % des sujets du groupe B, la chorioamnionite (50 % et 70 %, respectivement) et l'endométrite postpartum (0 % et 9 %, respectivement). Aucune de ces différences ne s'est avérée significative sur le plan clinique. Aucun cas de septicémie maternelle ou de décès maternel n'a été constaté au sein des groupes. Le groupe A a été associé à un AG plus avancé au moment de l'accouchement (27,5 semaines, par comp. avec 23 semaines, $P = 0,07$), l'AG au moment de la rupture des membranes étant similaire dans les deux groupes.

Conclusion : Ces résultats indiquent qu'un niveau accru de liquide amniotique résiduel à la suite d'une RPMP périvable est associé à la survie fœtale et à un délai accru avant l'accouchement, sans augmentation de la fréquence des complications maternelles. Cette information s'avérera utile dans le cadre du counseling des femmes enceintes présentant une RPMP < 24 semaines.

INTRODUCTION

Preterm premature rupture of membranes occurs in approximately 1% of continuing pregnancies, and, although associated with perinatal morbidity and mortality, generally results in good maternal and fetal outcomes.¹ Periviable PPRM occurs in 0.4% of continuing pregnancies, and is defined as rupture of membranes prior to the age of fetal viability, but after most spontaneous abortions have occurred (14 to 24 gestational weeks).² Perinatal outcomes in these cases have been reported as poor, mainly due to secondary deformational pulmonary hypoplasia, although neurological complications, infection, and congenital malformations have also been described.^{2,3} Furthermore, maternal health following periviable PPRM may be compromised due to the risks of chorioamnionitis, sepsis, placental abruption, and complications of immobility.⁴

Many factors are important when counselling the pregnant patient with periviable PPRM, including gestational age, latency to delivery, and risks of expectant management, given the high rate of associated complications. Data on maternal/neonatal morbidity, fetal/neonatal mortality, and fetal treatment are limited, because studies are generally small and differ in their inclusion and exclusion criteria. Dewan and Morris, in a systematic review of PPRM < 23 weeks between the years 1980 to 1994, reported a 20% perinatal survival rate.⁵ Although neonatal care has advanced, periviable PPRM has typically been associated with a very poor prognosis, and many patients are counselled to consider termination of pregnancy.

More recently, advances in both antenatal and neonatal care (including antenatal corticosteroid use, antibiotic use, use of postnatal surfactant, and neonatal gentle ventilation strategies) have allowed the definition of fetal viability to be revisited and the outcome for periviable PPRM to be questioned.²⁻⁸ Everest et al. reported a 55.7% survival rate after conservative management of periviable PPRM.⁶

To counsel patients in the setting of periviable PPRM appropriately, it is essential to present the best available options, including the risks and potential complications, using pertinent and centre-based outcome data. Fifty percent of pregnancies complicated by periviable PPRM deliver within seven days, with the majority delivering

within 48 hours.⁴ Therefore, cases that do not present with imminent labour or signs of chorioamnionitis require those involved to make the difficult decision either to pursue expectant management or to terminate the pregnancy.

One clinical variable which may assist in the counselling of these patients is the residual amniotic fluid volume as determined by ultrasound. Hadi et al., in a prospective cohort of 178 singleton pregnancies complicated by PPRM at 20 to 25 weeks' gestational age, found that the presence or absence of amniotic fluid was associated with latency to labour.⁹ However, their study excluded PPRM before 20 weeks' gestation, included amniotic fluid levels measured throughout pregnancy, and excluded all cases with latency to labour of less than seven days. They found that the frequency of chorioamnionitis was higher (33.8% vs. 21.5%, $P = 0.07$) and perinatal survival was lower (9.9% vs. 85%, $P < 0.01$) in patients with oligohydramnios (defined as ultrasonographic measurement of the deepest vertical pocket of amniotic fluid as < 2 cm) than in patients without oligohydramnios. Kilbride et al. compared survivors and non-survivors following periviable PPRM.³ They found that non-survivors, in addition to being less mature than survivors, having a longer duration of PPRM, and lower birth weights, were more likely to have severe oligohydramnios, defined as < 1 cm vertical pocket on ultrasonographic measurement of amniotic fluid. The finding of improved outcomes with higher levels of amniotic fluid has been confirmed in women with PPRM at later gestations as well.¹⁰

The primary objective of this study was to correlate both the average latency to delivery at the time of PPRM and perinatal mortality (fetal death or neonatal death within 30 days of life) with the level of residual amniotic fluid, as measured by 2-D ultrasound. Secondary outcomes included the incidence of chorioamnionitis, placental abruption, postpartum endometritis, retained placenta, maternal sepsis, and death in cases of periviable PPRM.

METHODS

We evaluated the outcomes of singleton pregnancies with rupture of membranes prior to 24 weeks of gestation and with a minimal latency to delivery of 48 hours, occurring between January 1, 2002, and January 15, 2011, in a retrospective cohort study. Gestational age was determined by last menstrual period and confirmed when possible by first trimester ultrasound. Rupture of membranes was diagnosed by clinical history in combination with a sterile speculum examination demonstrating vaginal pooling of amniotic

ABBREVIATIONS

DVP deepest vertical pocket

PPROM preterm premature rupture of membranes

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