Management of Preterm Premature Rupture of Membranes: A Comparison of Inpatient and Outpatient Care

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Abstract

Objectives: We sought to evaluate the safety of outpatient management of pregnancy complicated by preterm premature rupture of membranes (PPROM).

Study Design: We performed a retrospective cohort study of women with PPROM and a latency period of at least one week in one provincial health region between January 2007 and December 2012. We evaluated pregnancy outcomes for 133 women whose cases were managed using specialized community care and compared these with outcomes of a similar group of 122 women whose cases were managed entirely in the hospital. The primary outcome measured was the difference in the latency period between the two groups. For categorical variable outcomes, data were analyzed using chi-square tests, and continuous variable outcomes were compared using *t* tests.

Results: The median latency period for inpatients was 11 days compared with 18 days for patients in the community ($P < 0.001$). The most common reason for delivery was spontaneous labour (57% of inpatients and 50% of outpatients). Rates of stillbirth and neonatal mortality were similar between the two groups (3% in the inpatient group and 4% in the outpatient group). Precipitous vaginal delivery of a preterm breech infant was associated with mortality. Umbilical cord pH was < 7.10 in 5% of the inpatient group and 3% of the outpatient group. Median Apgar scores were slightly higher among the outpatient group.

Conclusion: The safety of outpatient management of appropriately selected patients with PPROM is comparable with the safety of in-hospital management. Patients with PPROM and a fetus in breech presentation may not be appropriate for outpatient management, especially prior to 28 weeks' gestation. The decision to manage a patient with PPROM on an outpatient basis must be made after careful evaluation, with a thorough discussion of the risks and benefits and with serial reassessment of patient suitability.

Key Words: PPROM (preterm premature rupture of membranes), outpatient management, inpatient management

Competing interests: None declared.

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Résumé

Objectifs : Nous avons cherché à évaluer la sûreté de la prise en charge ambulatoire de la grossesse compliquée par une rupture prématurée des membranes préterme (RPMP).

Devis d'étude : Nous avons mené une étude de cohorte rétrospective auprès de femmes ayant connu une RPMP et une période de latence d'au moins une semaine au sein d'une région sanitaire provinciale entre janvier 2007 et décembre 2012. Nous avons évalué les issues de grossesse qu'ont connues 133 femmes ayant fait l'objet d'une prise en charge au moyen de soins communautaires spécialisés et les avons comparées aux issues qu'ont connues un groupe similaire de 122 femmes ayant fait l'objet d'une prise en charge entièrement mise en œuvre à l'hôpital. Le critère d'évaluation principal a été la différence en matière de période de latence entre les deux groupes. Les données relevant des variables nominales ont été analysées au moyen de tests de chi carré, tandis que les données relevant des variables continues ont été comparées au moyen de tests *t*.

Résultats : La période de latence médiane a été de 11 jours dans le cas des patientes hospitalisées, par comparaison avec 18 jours dans celui des patientes traitées dans la communauté ($P < 0,001$). Le travail spontané a été la raison ayant le plus couramment mené à l'accouchement (57 % des patientes hospitalisées et 50 % des patientes ambulatoires). Les taux de mortinaissance et de mortalité néonatale ont été semblables dans les deux groupes (3 % dans le groupe des patientes hospitalisées et 4 % dans le groupe des patientes ambulatoires). L'accouchement vaginal précipité d'un fœtus préterme en présentation du siège a été associé à la mortalité. Le pH du cordon ombilical était $< 7,10$ chez 5 % des femmes du groupe des patientes hospitalisées et chez 3 % des femmes du groupe des patientes ambulatoires. Les indices d'Apgar médians ont été légèrement accrus chez les femmes du groupe des patientes ambulatoires.

Conclusion : La sûreté de la prise en charge ambulatoire de patientes présentant une RPMP adéquatement sélectionnées est comparable à la sûreté de la prise en charge en milieu hospitalier. La prise en charge ambulatoire pourrait ne pas convenir aux patientes présentant une RPMP dont le fœtus est en présentation du siège, particulièrement avant 28 semaines de gestation. La décision de procéder à la prise en charge ambulatoire d'une patiente présentant une RPMP doit être prise à la suite d'une évaluation rigoureuse, laquelle doit s'accompagner de la tenue d'une discussion avec cette patiente traitant exhaustivement des risques et des avantages de cette façon de faire; la compatibilité de ce type de prise en charge

pour la patiente en question doit également faire l'objet d'une réévaluation périodique.

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INTRODUCTION

Preterm premature rupture of membranes (PPROM), defined as the rupture of membranes more than one hour prior to labour and before 37 weeks' gestational age, may result in devastating maternal, fetal, and neonatal outcomes. In Canada, preterm delivery is responsible for 60% to 80% of neonatal deaths,[1] with PPROM implicated in close to one third of preterm deliveries.[2] Preterm delivery is also associated with significant neonatal morbidity because the preterm infant is at higher risk of respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis, sepsis, and retinopathy of prematurity. Prolongation of the latency period between rupture of the membranes and labour is not always feasible because spontaneous labour frequently ensues within one week of rupture of membranes,[3] and the risks of maternal and fetal infection, placental abruption, umbilical cord compression, and cord prolapse are significantly increased in the presence of PPROM.[4] Expectant management of a pregnancy complicated by PPROM prior to 34 weeks' gestational age demands close monitoring to ensure timely detection of any signs of infection or fetal compromise.[2] The time from rupture of membranes to delivery (the latency period) may extend for days, weeks, or even months. Although care of these patients has traditionally consisted of inpatient surveillance, bed shortages and high inpatient costs have led many centres to develop outpatient management strategies that simulate inpatient care. In a survey of 508 maternal-fetal medicine specialists, Ramsay et al. found that 43% of respondents endorsed outpatient management for expectant management of PPROM despite limited literature on this topic.[5]

In Calgary, Alberta, the Antenatal Community Care Program (ACCP) facilitates outpatient care for women with high-risk pregnancies. Since 2001, this specialized home care nursing program has provided care to over 250 women with pregnancies complicated by PPROM. Similar to inpatient care, management within the community involves reduced maternal activity levels, weekly obstetrical ultrasound assessment, and daily monitoring of maternal vital signs and fetal non-stress testing. Patients are assessed daily for any change in clinical status, such as abdominal pain, uterine contractions, vaginal bleeding, or malodorous discharge, and are immediately taken to the hospital in the presence of any concern.

Further research is required to substantiate the safety of home management. Proven benefits of outpatient management include cost efficacy[6] and patient satisfaction with care.[7] A randomized controlled trial by Carlan et al. of 67 carefully selected women with PPROM did not show a significant difference in safety between inpatient and outpatient management.[8] Conversely, a retrospective chart review of 65 inpatients meeting strict outpatient suitability criteria as defined by the study of Carlan et al. suggested that serious obstetric complications necessitating delivery within two hours of a change in clinical status occurred in 18% of study participants.[9]

METHODS

We performed a retrospective cohort study of women with PPROM with a latency period of at least one week in the Calgary, Alberta, region between January 2007 and December 2012. Information was obtained for patients whose cases were managed on an outpatient basis using the Calgary ACCP patient database. Inpatient data were obtained using medical records coding to locate patients with antepartum hospital admission for PPROM with seven days or more between admission and delivery.

Inclusion in the study required rupture of membranes confirmed on sterile speculum examination in the absence of labour between 20 and 34 weeks' gestational age. Patients were assessed in one of the three obstetrical units in Calgary and were managed in high-risk antepartum care units prior to consideration of outpatient management. Patients completed a recommended PPROM protocol involving intravenous administration of erythromycin and ampicillin, followed by oral erythromycin and amoxicillin (with the exception of patients with known allergies or adverse reactions), and intramuscular betamethasone (two 12 mg doses given 24 hours apart) as an inpatient.[9,10]

The criteria for outpatient management included the absence of maternal fever, labour, or significant vaginal bleeding; a normal fetal heart rate pattern; a cephalic, frank breech or complete breech position; and a fixed address and telephone number in proximity to Calgary. Our criteria were similar to those used in the study of Carlan et al.,[8]

ABBREVIATIONS

ACCP Antenatal Community Care Program

PPROM preterm premature rupture of membranes