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Outpatient management of prelabour rupture of membranes (PROM) at term – a re-evaluation and contribution to the current debate

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Abstract

Objectives: Our study aims to underpin the safety of ambulatory management for 24 h after PROM at term. Patient data from 2021 were compared with data from 2010 to 2013, when ambulatory management was first introduced at the Women's Clinic of the University Hospital of Basel.
Methods: In this retrospective study with historical control groups, we compared a cohort of women who underwent outpatient management of PROM at term in 2021, n=78 with two previous cohorts with inpatient management in 2010–2012, n=202 and outpatient management in 2013, n=37, respectively.
Results: The maternal and foetal outcomes of our cohort were comparable to those of the previous cohorts. The expected difference in shorter hospital stay was confirmed.
Conclusions: The study confirms the safety of an outpatient approach in the management of PROM at term. Further studies, especially RCTs, are needed for a definitive evaluation.

Keywords: prelabour rupture of membranes; premature rupture of membranes; outpatient management; induction of labour; chorioamnionitis

Introduction

Prelabour rupture of the membranes (PROM) is defined as spontaneous rupture of the amniotic membranes before the onset of labour. PROM is divided into PPROM (preterm PROM, <37th week of pregnancy) and PROM at term (≥37th week of pregnancy) [1]. PROM at term occurs in about 8 % of all pregnancies worldwide [2, 3] and accounts for around 90 % of PROM cases [4]. In over 60 % of cases of PROM, spontaneous labour begins within 24 hours (h), in 95 % within 72 h [5]. Different causes are suspected. PROM at term may reflect a physiological process of ripening of the membranes that sensitises them to uterine contractions [6]. Polyhydramnion, smoking, sexual intercourse or infectious processes may also be associated with PROM [2]. Furthermore, common aetiological factors between PROM and PPROM are discussed as for example the occurrence of PROM or abortion in the premedical history of the patient [1]. Rare risks following a PROM include umbilical cord prolapse with compression of the umbilical cord and premature placental abruption [7]. In addition, as the time between PROM and delivery increases, so does the risk of infection [8].

Until September 2012, all patients with PROM at term were admitted as inpatients at our institution without exception. From October 2012, patients were increasingly managed on an outpatient basis for 24 h or until the onset of labour – an approach that has become increasingly established internationally in recent years. A survey in 2016 showed that at least one quarter of maternity facilities in Switzerland probably offer outpatient management after PROM at term [9]. This approach is particularly appropriate in the context of the increasing economisation of the healthcare system, especially as it often corresponds to the pregnant woman's wish to wait for the labour in familiar surroundings [10]. A recent study provides evidence that this approach is probably even conducive to physiological labour progress [11]. Outpatient management of patients is subject to strict inclusion criteria, which are intended to ensure the greatest possible safety for mother and child. In addition, outpatients are admitted for induction of labour (IOL) after 24 h at the latest to minimise the risk of peripartum infections.

In-house data from our institution were already published in 2016 [12]. Patients who were managed as inpatients from 2010 to 2012 were compared with patients who were

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discharged to outpatient management from 2012 to 2013. There were no significant differences in maternal and foetal outcomes, only the expected difference in hospitalisation duration was confirmed. And although outpatient management has now become an increasingly common clinical practice, relatively little current clinical data is available to support the medical safety of this approach.

The aim of this study is to reevaluate the procedure for outpatient management at PROM using current clinical data from our institution in 2021.

Subjects and methods

Study design and study population

Vetter 2016 compared inpatient admission of patients with PROM at term (group A, n=202) vs. outpatient management (group B, n=37), based on data from 2010 to 2013.

In this retrospective study we analysed and compared data of a cohort of women with PROM at term who were discharged to outpatient management in 2021 (group C, n=78) with the two historical control groups.

- Group A: inpatient, n=202 (03/2010–10/2012)
- Group B: outpatient, n=37 (10/2012–01/2013)
- Group C: outpatient, n=78 (01/2021–12/2021)

All maternal and infant data were derived from the routine clinical data collected during the birth and postpartum period in our hospital and stored in the patient's medical records.

The modalities of outpatient management in 2021 did not differ from those in 2012. In particular, the same strict selection criteria for outpatient management were applied (Table 1) [12].

Rupture of membranes was based on accurate history and a clinical diagnosis with demonstration of visible amniotic fluid in the vagina with a speculum examination. In cases of unclear, suspected rupture of membranes the placental alpha-microglobulin-1 immunoassay (AmniSure®) was performed in cervicovaginal secretions [13]. Additionally, a routine pregnancy check-up was carried out, which included vital parameters, infection parameters (leukocytes and CRP), urine analysis and foetal monitoring (30-min CTG, foetal biometry). Women who met the inclusion criteria and agreed to outpatient management could be discharged after receiving detailed oral and written information about behavioural measures and warning signs of chorioamnionitis. Twelve hours after PROM, they returned to the clinic for a check-up (30-min CTG and laboratory control of infection parameters). Women were admitted for IOL if onset of labour did not occur within 24 h of the PROM [12]. Depending on cervical ripening, labour was induced with oral or vaginal prostaglandins or oxytocin.

Table 1: Inclusion and exclusion criteria for outpatient management.

Inclusion criteria	Exclusion criteria
– Singleton pregnancy	– Temperature increase (≥38 °C)
– Consent of the woman	– Maternal tachycardia (≥100 bpm)
– No relevant labour activity	– Foetal tachycardia (≥150 bpm)
– Clear amniotic fluid	– Tender uterus
– Due date (>37+0 weeks' gestation)	– Increasing labour activity
– Group B strep screening negative	– Foul-smelling amniotic fluid
– Foetus in cephalic position	– Leucocytosis (≥15,000/µL)
– No obstetric risk factors (breech presentation, gestational diabetes, pre-eclampsia, pregnancy induced hypertension, post caesarean section)	– Elevated CRP
	– Unclear or positive detection of group B streptococci (GBS)
	– Patient age<18 years
– No relevant internal maternal disease	
– Afebrility (<37.6 °C or <38.0° ear thermometer)	
– Normal infection laboratory (CRP<10 mg/L, Lc<15,000/µL)	
– Physiological CTG on admission	
– Hospital accessibility guaranteed within 30 min	
– Compliance of the patient	
– Good communication skills with the pregnant woman or accompanying persons	

In our study maternal and foetal outcomes were considered as primary endpoints. The analysed maternal outcomes were clinical signs of chorioamnionitis (fever, foetal tachycardia, infection parameters among others) [14], besides the need for IOL at 24 h and the mode of delivery. Foetal outcomes included birth weight, 5-min-APGAR and arterial umbilical cord pH as well as developing signs of infection. The secondary endpoint was the length of hospital stay, which provides indirect information on hospital costs. We compared the length of stay in the delivery room until transfer to the maternity ward as well as the duration of labour. We also measured the number of hours patients remained at home after PROM before being admitted to hospital.

Statistical analyses

For the descriptive statistics of the clinical characteristics of the study population, frequencies for categorical data and

median [min, max] for metric variables were calculated. For medians, p-values of overall tests and p-values of pairwise comparisons correspond to Kruskall-Wallis tests. For categorical data, we performed chi-squared tests (with continuity correction) or exact Fisher's tests when the expected frequencies in a cell were less than five. A p-value <0.05 is considered significant. All analyses were performed using the statistical software R version 4.4.0 [15].

The ethical approval was confirmed by the Ethics Committee of Northwestern and Central Switzerland (EKNZ) on 05.05.2022.

Results

A total of 317 patients were evaluated across the three investigated groups. Group A is the inpatient group, that serves as comparison (n=202; 03/2010–10/2012), group B (n=37; 10/2012–01/2013) and C (n=78; 01/2021–12/2021) are the groups managed as outpatients after PROM at term.

The composition of the patient groups proved to be similar (Table 2); well comparable were especially the two outpatient groups, with similar BMI, maternal age and week of pregnancy at the time of delivery.

Maternal outcomes were similar overall, with most outcomes not significantly different between the two groups. As illustrated in Table 2, in all groups, a comparable number of patients required priming at 24 h: 77 patients (38.3 %) in group A, 16 patients (34.6 %) in group B and 27 patients (34.6 %) in group C. In group A 45/202 (22.0 %) patients developed signs of chorioamnionitis, in group B 6/37 (16.2 %) and in group C 25/78 (32.5 %), however most antibiotics were used in group C.

As expected, there was a difference in the time of hospitalisation, defined as the number of hours from admission to the hospital until transfer to the maternity ward: group A had the longest length of stay with 24.2 h; in group B and group C length of stay was almost equal (13.5 vs. 13.0 h). The shortened hospitalisation time is also reflected in the hours spent at home before admission to the hospital: Median duration between PROM and admission was 2 h in group A, 20 h in group B and 16.1 h in group C. The duration of labour, defined as the number of hours between 4 cm of cervical dilation and delivery, did not differ among the three groups, being 4 h in group A, 5 h in group B and 5.7 h in group C.

As for the mode of delivery, the number of caesarean sections was not significantly different: 27/202 (13.4 %) in group A, 4/37 (10.8 %) in group B and 14/78 (17.9 %) in group C (Tables 3 and 4). Also, the detected increased number of operative vaginal deliveries in group C was not statistically significant. While 50 vacuum extractions were performed in group A (24.8 %), six vaginal operative deliveries were conducted in group B (16.2 %) as well as 25 in group C (32.1 %).

As shown in Table 5, there were only minor differences in foetal outcome. In group A 12 newborns exhibited a 5-min APGAR<7 (5.9 %), whereas in group B there was only one newborn (2.7 %) and in group C no newborn (0.0 %) with such an APGAR. When analysing the arterial umbilical cord

Table 2: Maternal and obstetric characteristics of the study population.

Characteristics	Group A n=202	Group B n=37	p-Value A and B	Group C n=78	p-Value A and C	p-Value B and C
Parity			0.16		0.02	0.85
I	138 (68.3 %)	31 (83.8 %)		66 (84.6 %)		
II	47 (23.3 %)	6 (16.2 %)		11 (14.1 %)		
≥III	17 (8.4 %)	0		1 (1.3 %)		
BMI, kg/m^2	28 (21;43)	27 (22;39)	0.10	27 (21;43)	0.02	0.90
Maternal age	30 (16;40)	31 (19;45)	0.20	33 (22;43)	0.001	0.26
Pregnancy week	40+0	40+0	0.74	39+6	0.22	0.41
Birth duration, h	4.0 (0;15)	5.0 (1; 11.5)	0.77	5.7 (0; 16.5)	0.25	0.46
Primiparous	6	5		8.5		
Multiparous	2	1.75		3.1		
Number of vaginal examinations	6 (2;15)	6 (2;13)	0.50	7 (2;15)	0.37	0.20
Primiparous	7	7		7.5		
Multiparous	5	4.50		6		
Hospitalisation, h	24.2 (2;108)	13.5 (2;48.5)	0.002	13.0 (0.4; 55.7)	<0.001	0.72
Hours until admission	2.0 (0.45; 29)	20.0 (5; 28.5)	<0.001	16.1 (2; 32.5)	<0.001	0.38

n, number; h, hours; BMI, body mass index. For categorical data counts and frequencies are presented and for metric variables median (min, max). For medians, p-values of overall tests and p-values of pairwise comparisons correspond to Kruskall-Wallis tests. For categorical data, p-values of overall tests and pairwise comparisons correspond to chi-squared tests (with continuity correction) or exact Fishers tests when the expected frequencies are less than five in some cell.

Table 3: Birth characteristics of the study population.

Characteristics	Group A n=202	Group B n=37	p-Value A and B	Group C n=78	p-Value A and C	p-Value B and C
Birth mode			0.50		0.11	0.07
Primiparous	n=138	n=31		n=66		
Multiparous	n=64	n=6		n=12		
Spontaneus	125 (61.9 %)	27 (73.0 %)	0.27	39 (50.0 %)	0.09	0.03
Primiparous	69 (50.0 %)	21 (67.7 %)		30 (45.5 %)		
Multiparous	56 (87.5 %)	6 (100 %)		9 (75.0 %)		
Vacuum extraction	50 (24.8 %)	6 (16.2 %)	0.36	25 (32.1 %)	0.28	0.12
Primiparous	46 (33.3 %)	6 (19.4 %)		23 (34.9 %)		
Multiparous	4 (6.3 %)	0		2 (16.7 %)		
Caesarian section	27 (13.4 %)	4 (10.8 %)	0.80	14 (17.9 %)	0.43	0.48
Primiparous	23 (16.6 %)	4 (12.9 %)		13 (19.7 %)		
Multiparous	4 (6.3 %)	0		1 (8.3 %)		
Priming after 24 h	77 (38.3 %)	16 (43.2 %)	0.70	27 (34.6 %)	0.66	0.49
Primiparous	59 (42.7 %)	14 (45.2 %)		22 (33.3 %)		
Multiparous	18 (28.1 %)	2 (33.0 %)		5 (41.7 %)		
Signs of chorioamniotis	45 (22.0 %)	6 (16.2 %)	0.54	25 (32.5 %)	0.19	0.19
Chorioamnionitis	0 (0.0 %)	0 (0 %)		3 (3.9 %)	0.03	0.55
Use of antibiotics	27 (13.4 %)	3 (8.1 %)	0.59	24 (30.8 %)	0.001	0.015

n, number; h, hours. For all the listed variables data counts and frequencies (%) are presented. The p-values were calculated with chi-squared tests (with continuity correction) or exact Fishers tests when the expected frequencies were less than five in some cell.

Table 4: Indications for caesarean sections and vacuum extractions in our study population.

	Group A n=202	Group B n=37	p-Value A and B	Group C n=78	p-Value A and C	p-Value B and C
Caesarean section	27 (13.4 %)	4 (10.8 %)	0.80	14 (17.9 %)	0.43	0.48
Obstructed labour	15 (7.4 %)	4 (10.8 %)	0.51	7 (50.0 %)	<0.001	0.005
Pathological CTG	11 (5.4 %)	1 (2.7 %)	0.70	5 (35.7 %)	0.002	0.004
Suspected chorioamnionitis	2 (0.99 %)	0 (0 %)	1.0	2 (15.4 %)	0.02	0.064
Premature placental abruption	1 (0.5 %)	0 (0 %)	1.0	0 (0 %)	1.0	–
On request	3 (1.5 %)	0 (0 %)	1.0	2 (15.4 %)	0.03	0.064
Vacuum extraction	50 (24.8 %)	6 (16.2 %)	0.26	25 (32.1 %)	0.28	0.12
Protracted birth	21 (10.4 %)	3 (8.1 %)	1.0	12 (48.0 %)	<0.001	0.001
Pathological CTG	27 (13.4 %)	3 (8.1 %)	0.59	16 (64.0 %)	<0.001	<0.001
Lack of maternal capacity to push	16 (7.9 %)	4 (10.8 %)	1.0	0 (0 %)	0.30	0.40
Suspected chorioamnionitis	2 (0.99 %)	0 (0.0 %)	1.0	1 (4 %)	0.30	0.40

n, number. The p-values were calculated with chi-squared tests (with continuity correction) or exact Fishers tests when the expected frequencies is less than five in some cell.

pH values, stratified according to primi- and multiparae, there were differences in the frequency of pH values >7.1. However, no significant difference was found.

Discussion

The main objective of this study was to confirm the safety of outpatient management after PROM at term by re-evaluating the hospital's internal data and procedures. Therefore, the primary endpoints were both maternal and foetal outcomes, while the secondary outcome took economic considerations into account. Overall, we were able to confirm very similar results between the inpatient and outpatient groups. There were no other adverse outcomes such as cord prolapse or abruptio placentae in our study cohorts.

Study limitation is the observational design with retrospective comparisons which renders the study potentially prone to bias and uncontrolled confounding, but the risk profiles in the three cohorts were similar, thus not suggesting the presence of such bias.

Analysing the existing literature and clinical guidelines, two debates can be distinguished. First, the question of

Table 5: Neonatal outcomes at birth in our study population.

	Group A n=202	Group B n=37	p-Value A and B	Group C n=78	p-Value A and C	p-Value B and C
Birth weight, g[a]	3,340	3,450	0.36	3,302	0.17	0.05
Primiparous	3,325	3,540		3,400		
Multiparous	3,350	3,300		3,480		
5-min APGAR<7	12 (5.9 %)	1 (2.7 %)	0.74	0 (0 %)	0.05	0.32
Primiparous	11 (5.4 %)	1 (2.7 %)		0 (0 %)		
Multiparous	1 (0.5 %)	0 (0 %)		0 (0 %)		
Arterial umbilical cord pH[b]						
Primiparous						
>7.20	106 (76.8 %)	25 (80.6 %)	0.82	27 (40.9 %)	<0.001	0.001
7.10–7.20	22 (15.9 %)	3 (9.7 %)	0.57	24 (36.4 %)	0.002	0.01
<7.10	2 (1.4 %)	1 (3.2 %)	0.46	1 (1.5 %)	1.00	0.54
Multiparous						
>7.20	54 (84.4 %)	5 (83.30)	1.0	6 (50.0 %)	0.01	0.32
7.10–7.20	3 (4.7 %)	1 (16.7 %)	0.31	2 (16.7 %)	0.17	1.0
<7.10	0 (0.0 %)	0 (0.0 %)		1 (8.3 %)	0.16	1.0
Overall						
>7.20	160 (79.2 %)	30 (81.1 %)	0.97	33 (42.3 %)	<0.001	<0.001
7.10–7.20	25 (12.4 %)	4 (10.8 %)	1.0	26 (33.3 %)	<0.001	0.02
<7.10	2 (1.0 %)	1 (2.7 %)	0.40	2 (2.6 %)	0.31	1.0

[a]Median. n, number. The p-values were calculated with chi-squared tests (with continuity correction) or exact Fishers tests when the expected frequencies were less than five in some cell. [b]The percentages of the frequencies per arterial umbilical cord pH value category relate to the subtotal of primiparae and multiparae in each respective group. The numbers do not add up to 100 because some patients' pH values could not be evaluated.

whether expectant management for 24 h after PROM is appropriate or whether active IOL is recommended after a short time (e.g. 6–8 h). Secondly, if expectant management is chosen, can this latency period of labour be safely spent at home?

Usually, clinical guidelines recommend an active approach for PROM management at term with IOL after a short period of time (mostly within 24 h) [7, 16]. A systematic review and meta-analysis from 2021 even recommend IOL within 6–12 h after PROM [4]. The reasoning is the underlying assumption that the most important consequence of PROM is the risk of infection, which increases over time [16]. These recommendations can be questioned, as there are not enough data available to draw final conclusions. Most guidelines refer to a Cochrane systematic review on this topic [2]. In this review 23 randomised controlled trials were included, with overall 8,615 patients (ibid.). The meta-analysis showed that a risk reduction for infection could be achieved if labour was induced at an early stage. However, about half of the patients included in this review originated from the large scale TermPROM study [5], that combined active vs. expectant management with hospital vs. outpatient approach. In this trial, patients with unknown Group B streptococcal status waited up to four days before starting induction treatment, which differs from contemporary practice [3, 5].

However, guidelines usually do allow waiting for a short period of time (usually up to 24 h) before starting to induce labour e.g. [16, 17], sometimes mentioning outpatient management (e.g. RANZCOG (7), [18]). Recent retrospective studies [3, 11] investigated this way of IOL after 24 h combined with outpatient management. No negative impacts on mothers and babies were found, just the hospitalisation time was shortened. Our study revealed similar results. At 24 h after PROM, similar numbers required IOLs, but patients who preferred outpatient management spent the latency period at home instead of at the hospital.

The main risk after PROM is the increased number of infections. The occurrence of chorioamnionitis, which may lead to early-onset neonatal sepsis [19] can be used as a marker. Chorioamnionitis has a high prevalence, occurring in 7 % of women after PROM at term and 40 % >24 h after term PROM [20]. Jung et al. supported the suspected correlation between conducted vaginal examinations and chorioamnionitis [14, 21, 22]. In our study no difference in the number of conducted vaginal examinations was found, so potential differences in vaginal germ contamination can be excluded.

Recently, the definition of chorioamnionitis has changed to Triple I, which means "intrauterine inflammation or infection or both" [23]. The procedure for diagnosing an infection has also changed; according to the current

AWMF guideline, CRP monitoring is unnecessary even with expectant management >24 h before IOL [18].

For better comparability and internal validity of this study, we used a definition of chorioamnionitis very close to the definition applied in Vetter 2016 for this investigation: fever>38.5 °C plus two further criteria: leukocytes>15,000/µl, CRP>20 mg/L, foetal tachycardia>160 bpm (instead of foetal tachycardia >180 bpm as in Vetter 2016). To get a more accurate picture of this phenomenon, we also examined the number of patients who developed single signs of chorioamnionitis. In group C overall, three patients (3.9 %) fulfilled the formal criteria of a chorioamnionitis, also more patients developed warning symptoms than the comparison groups, however the numbers differed not significantly.

The data also showed, that the use of antibiotics was higher in 2021. This fact is consistent with the slight increase in chorioamnionitis in group C. However, analysis of birth reports revealed that in 2021 the indication for antibiotic use was often broad and antibiotics were administered before the criteria for chorioamnionitis were met (e.g. Leukocytes<15,000/µL, CRP<20 mg or subfebrile temperature).

No differences in the frequency of delivery modes were reported from the systematic reviews/meta-analyses about active vs. expectant management [2]. In our study, we found a higher number of caesarean sections and operative vaginal deliveries in group C (see Table 3). However, the majority of vacuum deliveries in group C (see Table 4) were due to prolonged labour and abnormal CTGs rather than suspected cases of chorioamnionitis, so we do not see the increased rate of vacuum deliveries as being directly related to outpatient management. The increased number of caesarean sections is consistent with the fact that we also see an increase in the number of caesarean sections in the overall numbers in our maternity clinic from 34.6 % in 2012 to 37 % in 2021.

Even though the maternal characteristics of the outpatient groups are overall comparable (see Table 1) we have found the described outcome discrepancies with less spontaneous deliveries and a higher number of chorioamnionitis. There are probably several reasons for this observation. For example, the maternal age is slightly higher in group C. One is that the outpatient management introduced in 2012 was still new to the team, so the patients sent for outpatient management in 2012 were very carefully selected. As a result, the number of patients studied is rather small and therefore prone to bias. In 2021, despite the same inclusion criteria, more patients were sent for outpatient management, indicating that the team was more familiar with outpatient management and had gained some confidence in the approach. Overall the number of cases in our study is still limited and we should expect the results from larger trials.

A comparison with existing studies on foetal outcomes is once more challenging due to the considerable variation in the criteria and definitions of chorioamnionitis and neonatal infection [21]. In the systematic review by Middleton 2017 (including trials where IOL was not performed after 24 h), differences in neonatal outcomes were shown: when women had a planned early birth with immediate IOL, the neonates received less antibiotics and were less likely to require neonatal intensive care [2]. By contrast, retrospective studies that evaluated expectant outpatient management with IOL at 24 h revealed no discernible differences in neonatal outcome [3]. Also, our study showed comparable results in foetal outcomes among the three patient groups. Discrepancies were identified in the pH values of the umbilical cord blood in values >7.2 and between 7.10 and 7.2. However, no differences were observed in the values below 7.1 (what we consider to be the diagnosis of acidosis), which is the most crucial finding. There was no detectable difference in the number of referrals to the neonatal intensive care unit as a marker for severe clinical outcomes, 19 neonates (9.4 %) in group A, 2 (5.4 %) in group B and two children in group C (2.6 %) were admitted to the neonatal intensive care unit after birth. However, only seven children in group A (2.2 %), six children in group B (3.0 %) and one child in group C (1.3 %) were admitted for an infection-related clinical condition. The present study did not identify any significant differences in the neonatal intensive care admission rates between our groups. However, the study was not designed to detect such differences, and that further studies employing standardised criteria are required.

Cost-effectiveness and economic considerations were included as secondary endpoints of the trial. Is it ethically correct to bring economic interests into the medical discussion, especially when it comes to pregnant women and children [24]? It is an unfortunate reality that the medical field is unable to circumvent this conflict. The scarcity of resources inevitably gives rise to the question of how they should be allocated. It is evident that pregnant women and children should be provided with the highest possible standard of medical care. Nevertheless, when there are procedures that combine safe practices with high patient satisfaction and the additional benefit of resource savings, economic considerations become pertinent [24]. Although cost savings are not the principal objective of outpatient management of PROM, there is nevertheless a favourable economic consequence. In a context of constrained resources, these can then be allocated to situations during pregnancy where they are particularly valuable.

Our study demonstrates the potential for resource savings as a marker of indirect cost efficiency. We could demonstrate that outpatient management resulted in significantly shorter

hospital stays (measured from admission to transfer to the postnatal ward) thereby reducing hospital costs. Furthermore, the number of hours spent at home between PROM and hospital admission reflect the time that would be spent in hospital if expectant management was carried out for 24 h in hospital. This significantly more time spent at home with little need for care indirectly corresponds to the hospitalisation costs and resources saved.

An interesting discussion is the level of patient satisfaction, as there are conflicting statements. According to the RANZCOG guideline, "Women in the planned early birth group had more positive experiences compared with women in the expectant management group" [7]. This opinion is reflected in a systematic review which found that women in two trials preferred planned early birth [2]. However, if we look more closely at the origin of this statement, its validity can be questioned. In the TermPROM trial, women "were less likely to say they liked 'nothing' about their treatment than those in the expectant-management groups" [5]. The second trial referred to is a trial of acupuncture for the early birth group. No effect of acupuncture was shown, as the same number of patients still needed IOL [25]. However, acupuncture "was considered positive to receive (…) while waiting for labour to begin" [25]. So in this case, it was not the expectation of an early birth but the provision of alternative medical care for the patients that was important for contentment.

These findings contrast with more recent studies. A survey in Swiss birth institutions conducting outpatient management found a high level of satisfaction among the pregnant women [9]. However, it is questionable whether satisfaction in the low-risk population suitable for outpatient management would be much lower if they were admitted to hospital [26]. At our institution, an internal survey confirmed the high level of satisfaction with outpatient management among both medical staff and patients; pregnant women appreciated staying at home in familiar surroundings combined with a shortened hospital stay [27]. In addition, it can be assumed that the support of physiological birth can lead to a positive birth experience as well as to a strengthening of the bond between mother and child [11].

Overall outpatient management after PROM seems to be a safe option, if labour is induced within 24 h if necessary. This procedure combines high patient and staff satisfaction with less need of resources.

It is interesting that there is a general trend towards considering outpatient management for several conditions in high-risk pregnancies. This is due to increased financial pressures and staff shortages in maternity units, but also to the increasing importance of self-determination, which can lead to higher levels of patient satisfaction [28, 29]. Outpatient management is also being discussed as a safe option for PPROM [28]. And if outpatient management is discussed as an option of "family-orientated obstetrics" [28] for the even more risky condition of PPROM (considering the possibility of preterm birth), it should be discussed even more for PROM at term.

Conclusions

The comparison between the three patient groups in this retrospective study confirmed the safety of the outpatient approach while confirming the expected difference in length of hospital stay. Otherwise, there were no significant differences in key maternal and foetal outcomes in the outpatient management group.

This re-evaluation of PROM procedures at our clinic thus confirmed the current approach to offer outpatient management after PROM at term for low-risk women. We found that the compromise of waiting up to 24 h after PROM at term (but no longer) before recommending IOL, together with the offer to spend this time at home, combines a patient-centred approach with clinical safety and positive economic considerations.

A closer look at the existing literature revealed that the issue is not sufficiently supported by comparable data. The results of the available studies, and therefore the recommendations of the meta-analyses, are uncertain or even contradictory. This is also reflected in international guidelines, which are partly still based on the results of a trial that allowed for considerably longer delays until IOL. There is broad agreement that larger studies (possibly RCTs) are needed to confirm the safety of outpatient management for both mother and child [2, 3, 26]. Furthermore, protective factors and prophylactic measures, e.g. reducing the number of vaginal examinations to avoid chorioamnionitis could also be investigated [21].

Beyond these questions, there are many more that need to be asked and answered. With multidrug resistance on the rise worldwide, the need for antibiotics in expectant management needs to be critically evaluated. Even the question of the exact recommended time for IOL should be constantly reconsidered. For example, there is evidence that waiting for a maximum of 48 h may be an option to avoid caesarean section without worsening neonatal outcome [9, 30]. Other associated factors, such as long-term foetal outcomes and maternal factors like breastfeeding and postnatal depression, also need to be better understood [2].

Note: In 2023, the study results were presented as a poster at the SGGG Annual Congress in Geneva, Switzerland.

Research ethics: Ethical approval was granted on the 05.05.2022, document ID: 2022-00766. The study was conducted in accordance with the Declaration of Helsinki.

Informed consent: Informed consent was obtained from all individuals included in this study, or their legal guardians or wards.

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