



ORIGINAL ARTICLE

Impact of suspending labour companionship during the COVID-19 pandemic on intrapartum care and delivery outcomes

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Background: As part of infection control measures during the COVID-19 pandemic, labour companionship was suspended intermittently at public hospitals across Hong Kong.

Aims: The aim was to assess the impact of restricting labour companionship on intrapartum care and maternal and neonatal outcomes.

Materials and methods: This is a retrospective cohort study comparing patients admitted for vaginal delivery with and without a labour companion. Deliveries during 1 February to 20 May and 17 July to 11 September 2020 ('alone group') were compared to deliveries during the same periods one year earlier when companionship was unrestricted ('accompanied group'). Outcomes were controlled for age, parity, body mass index, birth weight, education level and induction of labour.

Results: There were 651 and 491 deliveries in the accompanied and alone groups, respectively. Overall, physiological maternal and neonatal outcomes were not significantly different. Neonates in the alone group were more likely to have skin-to-skin contact delayed beyond 60 min after delivery (odds ratio 1.48, 95% confidence interval 1.45–1.51). None of these infants were exclusively breastfed at the time of discharge.

Conclusions: The presence of a labour companion may encourage earlier initiation of skin-to-skin contact, which has been shown to improve bonding experience. However, families that have already been affected by previous restrictions can be provided some reassurance that physiological outcomes do not appear to be significantly different. In addition, interventions that encourage companion involvement, such as breathing exercises and massages, were not hindered, as midwives took on a greater role in supporting the parturient.

KEYWORDS

breastfeeding, COVID-19, delivery, labour, newborn

INTRODUCTION

As part of citywide infection control measures during the COVID-19 pandemic, patient visitation was suspended across all Hong Kong public hospitals for all specialties, including obstetrics

and gynaecology. This policy was also extended to include a ban on labour companionship by a person of the parturient's choice. Mothers continued to receive continuous one-to-one support from midwives during their labour, as per usual practice. Special visitation rights were granted to patients only on a case-by-case basis.

The World Health Organization¹ recommends parturients to be accompanied by a person of her choice, be it her partner, friend, doula or midwife. Continuous support during labour has been found to provide psychological benefits for mothers. For example, an Iranian study found that maternal anxiety levels were reduced when husbands were present during labour.² Another study found that Nepalese women felt a greater sense of self-confidence and relief from emotional distress in their husbands' presence.³

Although several studies have shown the psychological benefits of companionship, evidence regarding the effect on the physiological aspects of labour is limited and sometimes conflicting.

The Cochrane Review on Continuous Support for Women During Childbirth⁴ found that receiving continuous support during labour was associated with more successful spontaneous vaginal deliveries, shorter duration of labour and lower chance of requiring intrapartum analgesia. Newborns whose mothers received continuous support also appeared to benefit, with higher 5-min Apgar scores. However, most of the studies included in this review had limited statistical power or were classified as 'low quality' by the authors. In addition, a large number of studies included in the review examined the effects of support from doulas, which is not entirely applicable to our setting, as doulas are not commonly employed by mothers in Hong Kong.

One of the few randomised controlled trials with adequate statistical power which investigated the effects of labour companionship was conducted in Brazil.⁵ The study found that parturients reported increased satisfaction when provided with support from a lay companion. However, the study did not find any statistically significant difference regarding physiological outcomes.

On the contrary, a similar study conducted in a Nigerian unit found that labour companionship was associated with lower caesarean section rates and shorter duration of the active phase of labour, as well as a subjectively more satisfying labour experience.⁶

A point to note with the aforementioned studies is that they were conducted in a setting where the intervention group received support in addition to the usual level of support at the hospital. To our knowledge, no studies could be identified where the main intervention was restricting the choice of companion – perhaps due to the ethical issues of imposing such restrictions in a randomised controlled setting. The brief periods where labour companionship was suspended across all public hospitals in Hong Kong presented the unique opportunity to perform a natural experiment⁷ to assess the physiological impacts of such an intervention on mother and infant.

Objectives

The aim of this study was to assess the impact of suspending labour companionship on mothers and their newborns during the COVID-19 pandemic. This includes investigating the effects on intrapartum care, delivery outcomes and neonatal outcomes.

MATERIALS AND METHODS

This was a retrospective cohort study comparing maternal and neonatal outcomes of deliveries which occurred with and without a birth companion at our unit. Hospital policy regarding labour companionship was continually being adapted according to the local COVID-19 disease burden at the time. Due to the unpredictable nature of the pandemic, patients and hospital staff alike could not be certain if labour companionship would be allowed until the day of delivery itself.

Parturients were entered into either cohort based on whether labour companionship was suspended on their delivery date as part of citywide COVID-19 infection control restrictions, thereby representing a natural experiment.⁷

All patients who delivered during the periods of 1 February to 20 May 2020 and 17 July to 11 September 2020 were recruited into the cohort who delivered without labour companions ('alone group'). Visitors were not allowed to enter any hospital wards during this period and could come in contact with the mother and her newborn child only when they were discharged from in-patient care. The control group consisted of patients who delivered during the same periods one year earlier when COVID-19 restrictions were not present and labour companionship was allowed ('accompanied group'). Labouring mothers in both cohorts were provided with continuous one-to-one support from a designated midwife; the level of care was not affected by infection control measures.

Exclusion criteria for both cohorts included patients who voluntarily declined to have a labour companion present, deliveries before 37 weeks gestation, multiple pregnancies, non-vertex presentations, patients undergoing vaginal birth after previous caesarean delivery, caesarean deliveries without trial of labour and deliveries occurring before arrival to the labour ward.

Patients were identified by examining physical data records during the corresponding time periods. Data were obtained manually via the hospital Obstetric Specialty Clinical Information System (OBSCIS), Clinical Management System and physical patient records.

Maternal outcomes included duration of first and second stages of labour, mode of delivery, methods of intrapartum analgesia used, perineal tears, episiotomy and length of post-delivery hospital stay. The provision of intrapartum analgesia was not affected by the pandemic. Non-pharmacological methods of analgesia included breathing exercises, warm pads, massage, birth balls, aromatherapy and transcutaneous electrical nerve stimulation. Pharmacological methods included inhaled nitrous oxide, pethidine injection and epidural anaesthesia.

Fetal outcomes included the presence of meconium-stained liquor, Apgar score at 1 and 5 min of life, admission to neonatal intensive care unit for more than 24 h, exclusive breastfeeding at discharge, initiation of breastfeeding within 1 h of delivery and time to initiation of skin-to-skin contact with the newborn.

During data entry, time to initiation of skin-to-skin contact was categorised into one of three groups: within 5, 5–60 and longer than 60 min.

All of the maternal and fetal outcome data in our unit are documented in the patient's physical records and later entered into the electronic OBSCIS system manually.

Descriptive comparison between the two groups was assessed by Student's *t*-test and Fisher's test for continuous and categorical variables, respectively. Furthermore, linear regression was used to analyse continuous outcomes and logistic regression for categorical outcomes while controlling for age, parity, maternal body mass index (BMI), birth weight, education level and induction of labour to account for potential differences in patient profiles between the two groups. To reduce the chance of findings being spuriously significant, *P*-values were additionally adjusted by the false discovery rate (FDR). A *P*-value <0.05 was considered significant.

This study has been approved by the Institutional Review Board of the Hong Kong East Cluster Ethics Committee (reference number: HKECREC-2020-087).

RESULTS

There were 1756 deliveries during the study period. After the exclusion criteria were applied, 1182 were included in the study population; 1142 subjects were included in the final analysis after those with incomplete data entry (*n* = 40) were excluded; 651 patients delivered with a labour companion present before the COVID-19 pandemic ('accompanied group'), while 491 delivered with a companion absent during the pandemic ('alone group'). In sum, 94% (*n* = 1069) of the study population was of Chinese ethnicity. Overall, 56% (*n* = 363) of the accompanied group and 54% (*n* = 264) of the alone group were nulliparous. Other patient demographics are presented in Table 1. Maternal BMI was significantly

higher in the alone group (*P* = 0.02), although the actual difference of the mean between the two groups is 0.48 kg/m² and is not clinically significant. Statistical modelling for maternal and neonatal outcomes is detailed in Table 2.

Maternal outcomes

Overall usage of intrapartum analgesia was similar for both groups (adjusted *P* = 0.99). The rate of non-pharmacological analgesia usage initially appeared to be significantly higher for the alone group (*P* = 0.009), but this was no longer applicable after adjusting for FDR (adjusted *P* = 0.052). The rate of pharmacological analgesia usage was similar for both groups (adjusted *P* = 1.0). Out of all the different methods of analgesia, only breathing exercises were used significantly more by the alone group (adjusted *P* = 0.012). The durations of the first and second stages of labour were not significantly different (adjusted *P* = 1.0 and 0.37, respectively).

In comparison to normal vaginal delivery, there were lower rates of forceps deliveries (odds ratio (OR) 0.60, 95% confidence interval (CI) 0.59–0.61, adjusted *P* < 0.001) and caesarean sections (OR 0.61, 95% CI 0.61–0.62, adjusted *P* < 0.001) for the alone group. The rate of vacuum extraction was similar (adjusted *P* = 0.75). However, when separate regression analysis comparing spontaneous vaginal delivery to all other modes of delivery combined was performed, there was no significant difference between the two groups (*b* = 0.20, *z*(1133) = 0.18, adjusted *P* = 0.45).

Blood loss was not significantly different (adjusted *P* = 0.29). Initial regression analysis showed rates of first-degree tear (*P* = 0.013) and episiotomy (*P* = 0.014) to be significantly different, but this was no longer applicable after adjusting for FDR (adjusted *P* = 0.058 for both parameters). The rates of second-, third- and fourth-degree tears were similar. The length of stay after delivery was significantly shorter for the alone group by 0.23 days (95% CI 0.11–0.35, adjusted *P* = 0.002).

TABLE 1 Population demographics

Demographics	Accompanied group (<i>n</i> = 651)	Alone group (<i>n</i> = 491)	<i>P</i> -value
Age in years, <i>M</i> (SD)	32 (4.4)	32 (4.6)	0.72
Education level, <i>n</i> (%)			0.52
Primary	9 (1.4)	9 (1.8)	
Secondary	260 (40)	209 (43)	
Tertiary	382 (59)	273 (56)	
Gestational age in weeks, <i>M</i> (SD)	39 (1.0)	39 (1.1)	0.057
Nulliparous, <i>n</i> (%)			0.054
Yes	363 (56)	264 (54)	
No	288 (44)	227 (46)	
Maternal body mass index (kg/m ²), <i>M</i> (SD)	22 (3.5)	23 (3.6)	0.022
Neonatal birth weight (kg), <i>M</i> (SD)	3.1 (0.35)	3.2 (0.38)	0.73
Induction of labour, <i>n</i> (%)	283 (44)	236 (48)	0.13

M, mean; SD, standard deviation.

TABLE 2 Statistical modelling of intrapartum and delivery outcomes

Outcome	Accompanied group (n = 651) [†]	Alone group (n = 491) [†]	Estimate	95% CI	Odds ratio	Standard error	P-value	P-adjusted [‡]
Intrapartum analgesia	648 (99)	489 (99)	0.27	-1.6, 2.3	1.30	0.93	0.77	0.99
Non-pharmacological	631 (97)	487 (99)	1.4	0.45, 2.7	4.23	0.56	0.009	0.052
Breathing exercise	612 (94)	480 (98)	1.1	0.44, 1.8	2.98	0.35	0.002	0.012
Warm pads	65 (10)	33 (6.7)	-0.41	-0.87, 0.030	0.66	0.23	0.072	0.26
Massage	214 (33)	156 (32)	-0.0026	-0.27, 0.26	1.00	0.14	0.99	1.0
Birth ball	189 (29)	126 (26)	-0.16	-0.44, 0.12	0.85	0.14	0.26	0.46
Aromatherapy	1 (0.15)	0 (0)	-18	N/A	0.00	11 000	1.0	1.0
TENS	21 (3.2)	7 (1.4)	-0.76	-1.7, 0.067	0.47	0.45	0.088	0.26
Pharmacological	422 (65)	317 (65)	0.017	-0.24, 0.28	1.02	0.13	0.90	1.0
Nitrous oxide inhalation	394 (61)	308 (63)	0.13	-0.12, 0.38	1.14	0.13	0.32	0.53
Pethidine injection	0 (0)	3 (0.61)	20	N/A	560 000 000	6400	1.0	1.0
Epidural anaesthesia	72 (11)	48 (9.8)	-0.17	-0.58, 0.24	0.85	0.21	0.42	0.63
Duration of first stage of labour (min)	290 (180)	280 (190)	1.1	-18, 20	N/A	9.7	0.91	1.0
Duration of second stage of labour (min)	28 (35)	24.52 (31.32)	-2.4	-6.0, 1.2	N/A	1.8	0.19	0.37
Mode of delivery								
Normal vaginal delivery [§]	541 (83)	422 (86)	-	-	-	-	-	-
Vacuum extraction	84 (13)	57 (12)	-0.12	-0.50, 0.26	0.89	0.19	0.54	0.75
Forceps	17 (2.6)	8 (1.6)	-0.52	-0.54, -0.50	0.60	0.0093	<0.001	<0.001
Caesarean section	9 (1.4)	4 (0.81)	-0.49	-0.50, -0.48	0.61	0.0046	<0.001	<0.001
Blood loss in millilitres	310 (200)	330 (230)	18.4	-4.9, 42	N/A	12	0.12	0.29
Perineal tear								
First degree	162 (25)	103 (21)	-0.39	-0.69, -0.082	0.68	0.16	0.013	0.058
Second degree	146 (22)	94 (19)	-0.23	-0.52, 0.067	0.80	0.15	0.13	0.29
Third degree	7 (1.1)	1 (0.20)	-1.8	-4.7, -0.017	0.17	1.1	0.10	0.28
Fourth degree	0 (0)	1 (0.20)	19.7	-750, 750	340 000 000	10 000	1.0	1.0
Episiotomy	314 (48)	256 (52)	0.35	0.073, 0.64	1.43	0.14	0.014	0.058
Length of stay after delivery (days)	2.9 (1.2)	2.7 (0.92)	-0.23	-0.35, -0.11	N/A	0.062	<0.001	0.002
Meconium-stained liquor	95 (15)	78 (16)	0.16	-0.18, 0.49	1.17	0.17	0.35	0.55
Apgar score								
At 1 min of life	9.4 (0.83)	9.43 (0.90)	-0.015	-0.12, 0.086	N/A	0.051	0.78	0.99

TABLE 2 (Continued)

Outcome	Accompanied group (n = 651) [†]	Alone group (n = 491) [†]	Estimate	95% CI	Odds ratio	Standard error	P-value	P-adjusted [‡]
At 5 min of life	9.9 (0.19)	9.9 (0.30)	-0.023	-0.51, 0.0055	N/A	0.014	0.11	0.29
Admission to NICU for more than 24 h	43 (6.6)	43 (8.8)	0.30	-0.15, 0.75	1.35	0.23	0.19	0.37
Initiation of breastfeeding within 1 h	507 (78)	383 (78)	-0.0039	-0.29, 0.29	1.00	0.15	0.98	1.0
Exclusively breastfeeding at time of discharge	264 (41)	175 (36)	-0.22	-0.47, 0.026	0.80	0.13	0.081	0.26
Initiation of skin-to-skin contact in the labour ward								
Within 5 min of delivery [§]	550 (85)	415 (85)	-	-	-	-	-	-
5-60 min after delivery	85 (13)	58 (12)	-0.11	-0.47, 0.25	0.89	0.18	0.54	0.75
>60 min after delivery	16 (2.5)	18 (3.7)	0.39	0.37, 0.41	1.5	0.010	<0.001	<0.001

Degrees of freedom = 1133.

CI, confidence interval for the estimate; NICU, neonatal intensive care unit; TENS, transcutaneous electrical nerve stimulation.

[†]Continuous variables are summarised with mean (standard deviation) and categorical variables with n (%).

[‡]P-value adjusted by false discovery rate.

[§]As the outcomes are mutually exclusive for these variables, the most favourable outcome has been used as a reference group for comparison; the estimates represent the odds of an alternative outcome occurring in comparison to the reference group.

Neonatal outcomes

Rates of meconium-stained liquor (adjusted $P = 0.55$), Apgar score at 1 min (adjusted $P = 0.99$) and at 5 min of life (adjusted $P = 0.29$) and rate of admission to neonatal intensive care for more than 24 h (adjusted $P = 0.37$) were all similar among both groups. Initiation of breastfeeding within 1 h was similar for both groups (adjusted $P = 1.0$), as was for the proportion of neonates being exclusively breastfed at time of discharge (adjusted $P = 0.26$).

Neonates in the alone group were more likely to have contact delayed to beyond 60 min post-delivery (OR 1.48, 95% CI 1.45–1.51, adjusted $P < 0.001$). For both groups, none of the infants who received delayed skin-to-skin contact beyond 60 min were exclusively breastfed at time of discharge.

DISCUSSION

Overall, the intrapartum care and delivery outcomes for both mothers and newborns did not appear to be significantly affected by COVID-19 restrictions barring labour companionship.

Usage of both pharmacological and non-pharmacological analgesia was not significantly different between the two groups. This suggests that the pandemic did not restrict maternal access to various pain relief methods. The provision of non-pharmacological methods where involvement of the companion is encouraged, such as breathing exercises and massages, was not hindered by the absence of a companion, with the midwives taking up a greater role in supporting the parturient.

The rates of forceps delivery and caesarean section were significantly lower for the alone group, but the overall rate of spontaneous vaginal delivery remained similar when compared with instrumental and caesarean delivery collectively. These findings are in contrast to the aforementioned Cochrane Review.⁴ However, the scope of this review includes studies which specifically examine the effect of continuous support from doulas and midwives. Labouring mothers at our unit are already provided with continuous one-to-one support from a dedicated midwife assigned to them, regardless of whether a companion was present or not. Therefore, it is not entirely surprising that physiological outcomes are not significantly different between both groups as the level of support was similar.

The significant difference in post-delivery length of stay (adjusted $P = 0.002$) suggests that patients in the alone group were more likely to request an earlier discharge. However, it is difficult to attribute this solely to suspension of labour companionship and may instead be more due to other pandemic-related restrictions. Patients were not allowed visitors during their hospital stay – this may have led to more mothers requesting earlier discharge from hospital so that they could receive more hands-on support at home. However, the actual difference in duration between the two groups is less than a full day (0.23 days), which does not seem

clinically significant enough to cause major concern. The typical length of stay in our unit is three days for vaginal and uncomplicated instrumental deliveries and five days for caesarean delivery – there was no change in policy during the pandemic.

Newborn perinatal outcomes were also not affected, as reflected by the similar Apgar scores and rate of meconium-stained liquor. Admission to the neonatal intensive care unit was also similar between the two groups, although the total number of admissions was only 86 across both groups. A larger sample size may be required to properly detect the effect on this, although initial findings can provide some reassurance to parents who have already been affected by the restrictions.

A greater proportion of neonates had delayed initiation of skin-to-skin contact beyond 60 min after delivery in the alone group (adjusted $P < 0.001$); a potential explanation for this could be that mothers are less motivated to initiate contact with their newborn without their companion of choice present. Without emotional support from their companion of choice, mothers may feel more exhausted and need longer time to recuperate before holding their newborn for the first time. Although breastfeeding outcomes were not significantly different between the two groups overall, a closer look at those who had delayed skin-to-skin contact beyond 60 min in both groups showed that none of these infants were exclusively breastfed at the time of discharge. Studies have shown that early skin-to-skin contact is associated with better physiological neonatal outcomes, promotes exclusive breastfeeding and supports bonding.⁸ Thus, as part of the general efforts to promote exclusive breastfeeding, parturients should be allowed to be accompanied by a person of their choice to have earlier initiation of skin-to-skin contact.

Due to the retrospective study design, the psychological impact on mothers unexpectedly labouring alone could not be studied. Parental satisfaction with the labour process and impact on partners absent during the labour could also be further assessed.

The effect size of some outcomes with small magnitudes could not be adequately assessed as they were limited by the sample size. The sample size of the study was in turn limited by the duration of time for which COVID-19 restrictions banning labour companionship were put in place and was beyond the control of the investigators.

A literature review⁹ found that hospital staff sometimes expressed reservations about having a lay companion present in the labour ward, quoting concerns such as possible interference with medical decisions and risk of cross-infections. Contrary to this, our study shows that having a labour companion present does not significantly affect the physiological outcomes. This is the first study of its kind based in Hong Kong that focuses on the effects of suspending labour companionship on physiological outcomes. As there are no current plans for further suspension of labour companionship in the immediate future, this may be the only opportunity to assess how such restrictions can affect the Hong Kong population.

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