

Transfers in Planned Home Births Related to Midwife Availability and Continuity: A Nationwide Population-Based Study

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ABSTRACT: Background: Planning a home birth does not necessarily mean that the birth will take place successfully at home. The object of this study was to describe reasons and risk factors for transfer to hospital during or shortly after a planned home birth. **Methods:** A nationwide study including all women who had given birth at home in Sweden between January 1, 1992, and July 31, 2005. A total of 735 women had given birth to 1,038 children. One questionnaire for each planned home birth was sent to the women. Of the 1,038 questionnaires, 1,025 were returned. Reasons for transfer and obstetric, socioeconomic, and care-related risk factors for being transferred were measured using logistic regression. **Results:** Women were transferred in 12.5 percent of the planned home births. Transfers were more common among primiparas compared with multiparas (relative risk [RR] 2.5; 95% CI 1.8–3.5). Failure to progress and unavailability of the chosen midwife at the onset of labor were the reasons for 46 and 14 percent of transfers, respectively. For primiparas, the risk was four times greater if a midwife other than the one who carried out the prenatal checkups assisted at the birth (RR 4.4; 95% CI 2.1–9.5). A pregnancy exceeding 42 weeks increased the risk of transfer for both primiparas (RR 3.0; 95% CI 1.1–9.4) and multiparas (RR 3.4; 95% CI 1.3–9.0). **Conclusions:** The most common reasons for transfer to hospital during or shortly after delivery were failure to progress followed by the midwife's unavailability at the onset of labor. Primiparas whose midwife for checkups during pregnancy was different from the one who assisted at the home birth were at increased risk of being transferred. (BIRTH 35:1 March 2008)

Key words: planned home birth, transfer, referral, midwifery

Planning a home birth does not necessarily mean that the birth will take place successfully at home. The risk of transfer during labor or immediately after delivery constitutes one of the arguments against home birth in high-resource countries. Reported transfer rates for planned home births during labor vary from 8 to 40

percent (1–6). The primary reported reason for transfer is failure to progress in the first or second stage of labor, and the second most frequent reason is prolonged rupture of membranes. Primiparas are at higher risk of transfer after the onset of labor; available evidence shows that more than one-third had to

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be transferred to hospital, usually due to slow labor progress (1,6,7). Johnson and Daviss found that about 4 percent of all women intending to give birth at home had to be urgently transported to hospital during labor or shortly after birth (4). After delivery, hemorrhage constitutes the most common reason for transfer.

In Sweden, the health authorities do not recommend, and seldom finance, home births. A woman who wishes to give birth at home not only has to find a midwife willing to assist her but must also pay for the service herself. Since home births are a sideline activity, the midwives who provide this service are usually employed in prenatal or delivery wards and mostly have a full-time work schedule at a clinic. Thus, the low prevalence of home births in Sweden (<1 in 1,000) is probably due to practical and financial circumstances rather than women's preferences (8).

We do not know, however, why a planned home birth ends with a hospital birth in a country in which the authorities do not support home births. Thus, the aim of this study was to investigate the prevalence of, and risk factors associated with, transfer during or shortly after a planned home birth in Sweden, for both primiparas and multiparas.

Methods

Midwives who assist at home births in Sweden were identified through the Swedish Home Birth Association and an announcement in the national midwifery journal, which is read by 95 percent of registered midwives. We informed the midwives about the study and asked them to forward information to all women they had assisted during a planned home birth (including births transferred during labor) from January 1, 1992, until July 31, 2005.

To reach women who had given birth without professional assistance, announcements were also published in magazines directed toward parents, and information about the study was placed on the Internet. The Swedish Home Birth Association sent a letter to their members informing them about the study.

We developed a study-specific questionnaire on the basis of clinical experience, a literature search, our own and others' experience of clinical work, and interviews with parents who had experienced a planned home birth. The questionnaire was tested for face validity; eight women completed the questionnaire in the presence of an investigator to ensure that they understood the questions correctly. All women ($n = 735$) who agreed to participate in the study received one questionnaire for each planned home birth they had

experienced (including births in which the women were transferred during labor or after delivery) during the study period. The questionnaire contained items about the women's sociodemographic background, health, obstetric history, and the care received during each of their planned home births. In addition, one section was on the subject of transfer under the heading, "Please answer the following questions if you were transferred to hospital during labor or shortly after your planned home birth." Six reasons for transfer were listed as follows: "slow progress," "prolonged rupture of membranes," "meconium in the amniotic fluid," "malposition," "fetal distress," and "need for pain relief." If none of these reasons was relevant, the woman could describe the reason in her own words under the heading of "Other reasons."

Two questions pertained to the presence of a midwife: "Did you arrange to have a midwife present during your planned home birth?" and "Did you have a midwife present during your planned home birth?" The second question could be answered by "Yes, I had one midwife present," "Yes, I had two midwives present," "Yes, I had more than two midwives present," and "No, I did not have a midwife present." We also asked the women at what point in time they decided to give birth at home and about caregiver continuity. The latter question was formulated as follows: "Did you have the same midwife present at your planned home birth as the one you had seen for prenatal checkups?" The answer could be "Yes" or "No," and the result was used in the regression analysis for identifying risk factors for transfer.

Anonymity was ensured by the fact that the women returned the questionnaire without codes or other forms of identification and in a separate envelope from that which contained the form, serving as confirmation that they had returned the questionnaire. Data collection took place from March 1, 2004, to December 31, 2005.

Data Analysis

Statistical analyses were conducted using the SPSS 12.0 software program for Windows (9).

Descriptive statistics were employed to describe the frequencies of reasons for transfer. Women who were transferred were compared with those who successfully gave birth at home in terms of sociodemographic situation, health, obstetric history, and care received. Differences between the two groups were calculated using relative risk (RR) with 95 percent confidence intervals. Variables that differed significantly in the bivariable analysis were tested and adjusted by means of logistic regression for each category. The study

was approved by the Regional Research and Ethics Committee of the Karolinska Institutet, Stockholm, Sweden.

Results

Forty-three midwives who had assisted at between 1 and 115 planned home births during the study period were identified. In all, 735 women were eligible for the study after the exclusion of 21 women (14 of whom had moved abroad, 3 who had died, 3 who had a protected identity, and 1 who had an incorrect social security number). Of the eligible women, 727 (99%) agreed to participate in the study, of whom, 419 were informed by their midwife and the other 316 volunteered in response to the announcements. Each woman had experienced between 1 and 6 planned home births, yielding a total of 1,038 births. After two reminders, 1,025 (99%) questionnaires were returned. One of every four women (23%) was a primipara and the most common was giving birth to the second child (33%). Less than 10 percent had more than four children previously. The age of the women ranged from 16 to 43 years with a mean of 27.1 years.

In 128 (12.5%) of the 1,025 planned home births, the woman was transferred to hospital and 109 (85%) of the transfers took place before delivery (Table 1). The most common reason for transfer before delivery was failure to progress (59 planned home births) and the second most common reason was that the midwife booked for the home birth was not available at the onset of labor (18 births). Seven transfers occurred due to prolonged rupture of membranes, 6 to malpresentation, 6 to fetal distress, and a further 6 as a result of feelings of anxiety on the part of the mother. Meconium in the amniotic fluid led to 5 transfers and the woman's need for pain relief to 2 transfers. Of all transfers, 19 occurred after delivery, 9 due to hemorrhage, 4 to placenta retention, 4 because of concern for the baby's health, 1 due to eclampsia, and 1 for a woman who required suturing after delivery.

Risk of Transfer among Primiparas

Almost 1 of 4 of all primiparas who had planned a home birth gave birth in hospital (RR2.5; 95% CI 1.8–3.5) (not included in the table). Being a young mother significantly reduced the risk of transfer. After adjustment for age, the risk of transfer was greater if the mother was single or lived in a rural area (Table 2). The risk of being transferred was four times greater if the woman had a different midwife assisting her during the delivery than the one she had consulted

for prenatal checkups. Furthermore, transfers were three times more common among women with a pregnancy exceeding 42 weeks (Table 3).

Risk of Transfer among Multiparas

In the case of multiparas, after adjustment for age, residential area, and educational level, no statistically significant sociodemographic risk factor was found for a planned home birth to take place in hospital (Table 2). Multiparas with more than 3 years of university studies had half the risk of transfer compared with those who had a lower level of education.

The risk of transfer was higher for multiparas who made the decision to give birth at home during the last week of pregnancy. This latter group and those who did not have professional assistance during the birth had the greatest risk of transfer. For women with a body mass index higher than 30, 4 of 6 births took place in a hospital delivery ward (Table 3).

Multiparas with a pregnancy exceeding 42 weeks and a baby weighing more than 4,500 g or less than 2,500 g were at increased risk of being transferred to hospital during labor or shortly after delivery. Six percent of the multiparas had previously undergone a cesarean section and thus were at higher risk of being transferred (Table 3).

Table 1. Women's Explanation About Why They Were Transferred to Hospital During or After a Planned Home Birth

<i>Reason for Transfer</i>	<i>No. (%)</i>	<i>Primiparas Multiparas</i>	
		<i>No. (%)</i>	<i>No. (%)</i>
Transfer during labor			
Failure to progress	59 (46)	33 (58)	26 (37)
Booked midwife not available at time of delivery	18 (14)	6 (10)	12 (17)
Prolonged rupture of membranes	7 (5)	3 (5)	4 (6)
Fetal distress	6 (5)	2 (4)	4 (6)
Woman anxious	6 (5)	1 (2)	5 (7)
Malpresentation	6 (5)	3 (5)	3 (4)
Meconium	5 (4)	5 (9)	0 (0)
Need for pain relief	2 (2)	0 (0)	2 (3)
Transfer after birth			
Hemorrhage	9 (7)	1 (2)	8 (11)
Child's need	4 (3)	1 (2)	3 (4)
Placenta retention	4 (2)	2 (4)	2 (3)
Eclampsia	1 (1)	0 (0)	1 (1)
Tears needing surgical repair in the hospital	1 (1)	0 (0)	1 (1)
All	128 (100)	57 (100)	71 (100)

Table 2. Relative Risk of a Woman Being Transferred During a Planned Home Birth in Relation to Sociodemographic Variables

Maternal Characteristic	Percentage of Primiparas Transferred (n = 244)		Relative Risk of Transferral	95% CI of Relative Risk	Relative Risk Adjusted for Woman's Age	95% CI of Adjusted Relative Risk	Percentage of Multiparas Transferred (n = 781)		Relative Risk of Transferral	95% CI of Relative Risk	Relative Risk Adjusted for Woman's Age, Residential Area, and Educational Level	95% CI of Adjusted Relative Risk
	No./Total	No. (%)					No./Total	No. (%)				
Age (yr)												
< 25	6/56 (11)		0.4	0.2-0.9†			4/32 (12)		1.2	0.7-1.6	1.4	0.7-2.0
25-39	49/179 (27)		1.0	Reference			61/685 (9)		1.0	Reference	1.0	Reference
> 39	2/9 (22)		0.8	0.3-2.8			7/64 (11)		2.1	1.3-3.8*	1.7	0.9-3.4
Education												
Primary and secondary school	4/16 (25)		1.2	0.5-7.3	0.6	0.2-1.7	0/30 (0)		0.0	Not done	0.0	Not done
College/university	37/162 (23)		1.0	Reference	1.0	Reference	58/506 (11)		1.0	Reference	1.0	Reference
1-3 yr												
University > 3 yr	11/66 (16)		0.8	0.4-1.0	0.6	0.4-1.0	14/244 (6)		0.5	0.2-0.8†	0.5	0.3-0.9†
Married	46/207 (22)		1.0	Reference	1.0	Reference	66/742 (9)		1.0	Reference	1.0	Reference
Single	11/37 (30)		1.3	0.6-2.9	2.0	1.1-3.7*	5/37 (14)		1.5	0.5-4.0	1.4	0.5-3.8
Born in Sweden	45/194 (23)		1.0	Reference	1.0	Reference	57/643 (9)		1.0	Reference	1.0	Reference
Born in other country	12/50 (24)		1.2	0.5-2.8	1.2	0.8-1.9	15/137 (14)		1.5	0.8-2.9	1.5	0.8-2.7

Note: A total number of fewer than 244 or 781 indicate missing internal values.

*p<0.05; †p<0.01; ‡p<0.001.

Table 3. Relative Risks of a Woman Being Transferred in Relation to Variables Related to Health, Obstetric Condition, and Care Received

Variables	Percentage of Primiparas Transferred (n = 244)		Relative Risk of Transferral	95% CI of Relative Risk	Relative Risk Adjusted ^a	95% CI of Adjusted Relative Risk	Percentage of Multiparas Transferred (n = 781)		Relative Risk of Transfer	95% CI of Relative Risk	Relative Risk Adjusted ^b	95% CI of Adjusted Relative Risk
	No./Total	No. (%)					No./Total	No. (%)				
Health variables												
Smoker	54/236 (23)	3/8 (38)	1.0	Reference	Not applicable	Not applicable	66/750 (9)	6/31 (19)	1.0	Reference	1.0	Reference
Nonsmoker			1.6	0.5–8.0	Not applicable	Not applicable			2.5	0.9–7.2	2.7	0.9–6.8
BMI												
< 20	13/64 (20)		0.8	0.4–1.8	Not applicable	Not applicable	12/160 (8)		0.8	0.4–1.5		
21–25	23/103 (22)		1.0	Reference			31/320 (9)		1.0	Reference		
26–30	2/6 (33)		1.7	0.3–10.0			7/60 (12)		1.2	0.5–3.0		
> 30	No subject		No subject	No subject			4/6 (67)		20.7	3.6–119.1 [‡]		
Obstetric variables												
< 37 gestational wk	2/5 (40)		3.0	0.4–23.0			2/10 (20)		1.9	0.3–12.3		0.3–12.3
37–42 gestational wk	49/218 (22)		1.0	Reference			59/685 (9)		1.0	Reference		Reference
> 42 gestational wk	6/13 (46)		3.0	1.1–9.4 [†]			6/27 (22)		3.4	1.3–9.0 [†]		1.4–8.7 [†]
Previous CS							10/48 (21)		2.7	1.2–6.3 [†]		1.2–6.3 [†]
No previous CS							62/733 (8)		1.0	Reference		Reference
Baby's weight (g)							3/6 (50)		33.3	3.3–338.0 [†]		3.0–336.3 [†]
< 2,499	1/5 (20)		0.5	0.0–6.4								
2,500–4,499	51/220 (23)		1.0	Reference			58/687 (8)		1.0	Reference		Reference
> 4,500	4/11 (36)		2.0	0.6–7.2			10/57 (18)		2.4	1.5–5.1 [*]		1.4–5.2 [*]
Care-related variables												
Decided to give birth at home:												
Before pregnancy	24/84 (28)		1.2	0.6–2.4			33/455 (7)		0.6	0.4–1.1		0.3–0.9 [*]
< 6 mo	29/120 (23)		1.0	Reference			28/228 (12)		1.0	Reference		Reference
> 6 mo	4/37 (11)		0.8	0.2–1.2			3/70 (4)		0.4	0.1–1.2		0.1–1.1
Last week of pregnancy	0/3 (0)		Not done	Not done			8/25 (32)		2.5	0.9–6.7		1.0–5.7 [*]
Ultrasound	20/97 (21)		1.0	Reference			53/499 (12)		1.0	Reference		Reference
No ultrasound	37/147 (25)		0.9	0.8–1.8			19/332 (6)		0.5	0.3–0.9		0.3–0.7 [†]
Midwife continuity	10/96 (10)		1.0	Reference			24/233 (10)		1.0	Reference		Reference
No midwife continuity	45/148 (30)		4.4	2.1–9.5 [‡]			48/381 (11)		1.0	0.6–1.8		0.7–1.9
Midwife present	51/215 (24)		1.0	Reference			50/614 (8)		1.0	Reference		Reference
Midwife not present	6/29 (21)		0.6	0.2–1.6			22/167 (13)		1.8	1.0–3.3 [*]		0.9–2.7

* p < 0.05; † p < 0.01; ‡ p < 0.001.

^aCare-related variables adjusted for continuity of midwife's assistance.

^bHealth variables adjusted for BMI; obstetric variables adjusted for length of pregnancy, CS, and baby's weight; and care-related variables adjusted for midwife's presence.

BMI = body mass index; CS = cesarean section.

Discussion

In this nationwide sample of 1,025 planned home births, 14 percent of all transfers took place because the midwife who was booked for the birth was not available at the onset of labor. For both primiparas and multiparas, the transfer rate was three times higher if the labor started after 42 gestational weeks when compared with term pregnancies.

From a global perspective, the presence of a skilled attendant is one of the most important factors for reducing maternal and perinatal mortality. Ngenda and Khoo reported complications in 2 of 27 transferred planned home births due to lack of professional care (10). In studies from countries where the health care system provides birth assistance (4,6), no reports are noted of transfers being influenced by the absence of a midwife. Among the 25 women who had made the decision to give birth at home during the last week of pregnancy, 11 did not have a midwife available at the onset of labor.

One of four primiparas was transferred to hospital after the onset of labor. The latent phase among primiparas is longer and may require a greater number of interventions (11). The progression of labor for primiparas in the active phase is also slower compared with multiparas and assisted deliveries are more common (12,13). One important risk factor for transfer of both primiparas and multiparas was giving birth to a baby with a gestational age of more than 42 weeks. Complications associated with postterm delivery at home have been reported in Australia, the United States, and Canada (1,4,10). In the Netherlands, post-term deliveries have not been reported as a reason for transfers, possibly because one of the criteria for home birth within the Dutch health care system is a term pregnancy (14). In our cohort, 40 deliveries were post-term; 10 of these women were transferred during labor due to failure to progress, with the exception of 1 woman, where the midwife was not available. In several countries, births after the 42nd week of gestation are not handled in alternative birth settings since they are not considered "normal" (15,16).

Nearly half of the transfers occurred due to failure to progress, which is in line with findings from previous research. Anderson and Murphy showed that failure to progress was the reason for 496 of 905 transfers (1). Johnson and Daviss (4) reported this reason for transfer in 307 of 655 women, whereas in Davies et al's study (17) on planned home births, 13 of 35 transfers occurred for the same reason. No consensus exists with respect to the normal duration of labor for a primipara (18). Waldenström and Nilsson reported that the duration of labor was longer in an alternative birth setting than in a delivery ward

(19). Failure to progress is also seen as the most common reason for transfer in this context (16). Our study, based on self-reported reasons for transfer, confirmed previous results pertaining to reasons for transfer based on birth records provided by midwives or physicians.

The transfer prevalence was 12.5 percent in our cohort, which is a rate on the same level as that reported by Johnson and Daviss (4) in the northern U.S. and Canada, where 12.1 percent of planned home births took place in hospital. The lowest transfer rates are reported in three studies from the U.S.: the Farm Study (2) and Anderson and Murphy (1), in both of which 8 percent of all planned home births were transferred, and Murphy and Fullerton (5), with 8.3 percent. The highest transfer rate, 40 percent, was seen among primiparas in a study from the Netherlands (6). In the Dutch context, women with high-risk pregnancies are not permitted to give birth at home and thus do not influence the prevalence of transfer. Our cohort, however, included women with a previous cesarean section, diabetes, twins, and pregnancies more than 42 weeks. It can be assumed that the transfer rate would have been lower had these women been excluded.

According to statistics from the home birth association and the Medical Birth Register, almost all planned home births during the study period were included. The fact that no research had been carried out on this subject in Sweden could be one explanation for the high response rate. Another explanation may be that the negative attitude toward home birth among health authorities makes women eager to share their experience of a planned home birth.

Our population-based setting and high participation rate diminish the risk of problems due to selection. We cannot, however, exclude the possibility that women who did not participate would have answered differently to questions about the reasons for transfer. Our use of self-administered questionnaires prevents interview-related bias. Generalizability to other populations and periods may be compromised by time and culture-specific attitudes among women. The reasons for transfer are based on the women's own statements. It is possible that the women did not have the correct information about the indication for transfer, and it is also likely that they did not remember exactly what happened. However, Simkin stated that women's birth memories are generally accurate and detailed 20 years after the birth of their first baby (20). Self-reported complications and interventions in hospital births have been validated by Wiklund et al (21), showing a total correspondence between the labor records and the women's reports. Being transferred during labor is a dramatic event; thus, it is likely

that a woman would remember and discuss the transfer with her home birth midwife after the birth. The routine in Swedish delivery wards is that the woman is given a copy of her labor record and offered the opportunity to read it in the presence of a midwife before discharge.

Conclusions

The most common reasons for transfer to hospital during or shortly after delivery were failure to progress followed by the midwife's unavailability at the onset of labor. Primiparas whose midwife for check-ups during pregnancy was different from the one who assisted at the home birth were at increased risk of being transferred. Transfer plans should be outlined in advance of all planned home births, and primiparas, women with a pregnancy exceeding 42 weeks, and women with a previous cesarean section should be informed about the increased risk of transfer. The presence of a midwife at all home births and caregiver continuity for primiparas are of particular importance to reduce the risk of transfer.

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