

# Planned home births assisted by nurse midwives: maternal and neonatal transfers\*

PARTOS DOMICILIARES PLANEJADOS ASSISTIDOS POR ENFERMEIRAS OBSTÉTRICAS: TRANSFERÊNCIAS MATERNAIS E NEONATAIS\*

PARTOS DOMICILIARIOS PLANIFICADOS ATENDIDOS POR ENFERMERAS OBSTÉTRICAS: TRASLADOS MATERNALES Y NEONATALES

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## ABSTRACT

The objective of this explorative and descriptive study was to describe the rates and reasons for intrapartum transfers from home to hospital among women assisted by nurse midwives, and the outcomes of those deliveries. The sample consisted of eleven women giving birth and their newborns, from January 2005 to December 2009. Data was collected from the maternal and neonatal records and was analyzed using descriptive statistics. The transfer rate was 11%, most of the women were nulliparous (63.6%), and all of them were transferred during the first stage of labor. The most common reasons for transfer were arrested cervical dilation, arrested progress of the fetal head and cephalopelvic disproportion. Apgar scores were  $\geq 7$  for 81.8% of the newborns; and there were no admissions to the neonatal intensive care unit. The results show that planned home births assisted by nurse midwives following a clinical protocol, had good outcomes even when a transfer to the hospital was needed.

## DESCRIPTORS

Home childbirth  
Obstetrical nursing  
Patient transfer  
Hospitalization

## RESUMO

O presente trabalho trata-se de estudo exploratório-descritivo que teve como objetivo descrever a taxa e as causas de transferência intraparto para o hospital de mulheres assistidas no domicílio por enfermeiras obstétricas e os desfechos desses nascimentos. A amostra foi composta por onze mulheres e seus recém-nascidos, de janeiro de 2005 a dezembro de 2009. Os dados foram coletados em prontuários e cadernetas de saúde e analisados por estatística descritiva. A taxa de transferência foi de 11%, a maioria de nulíparas (63,6%), e todas foram transferidas durante o primeiro período clínico do parto. Os motivos mais frequentes de transferência foram parada de dilatação cervical e progressão da apresentação fetal, e desproporção céfalo-pélvica. Os escores de Apgar no 1º e 5º minutos foram  $\geq 7$  em 81,8% dos casos e não houve internação em unidade de terapia intensiva neonatal. Neste estudo constatou-se que o parto domiciliar planejado assistido por enfermeiras obstétricas, com protocolo assistencial, apresentou bons resultados maternos e neonatais, mesmo quando a transferência para o hospital foi necessária.

## DESCRITORES

Parto domiciliar  
Enfermagem obstétrica  
Transferência de pacientes  
Hospitalização

## RESUMEN

Estudio exploratorio descriptivo que objetivó describir la tasa y causas de traslados hospitalarios intraparto a mujeres atendidas en domicilio por enfermeras obstétricas y los desenlaces de tales nacimientos. Muestra compuesta por once mujeres y sus recién nacidos, de enero 2005 a diciembre 2009; datos recolectados a partir de historia clínicas y carpetas de salud, analizadas por estadística descriptiva. La tasa de traslado fue 11,0%, mayoritariamente de nulíparas (63,3%), todas ellas trasladadas durante el primer período clínico del parto. Los motivos más frecuentes obedecieron a interrupción de dilatación cervical, progresión de presentación fetal y desproporción céfalopélvica. Los puntajes de Apgar en minutos 1 y 5 fueron  $\geq 7$  en 81,8% de los casos, no produciéndose internación en unidad de terapia intensiva neonatal. Según el estudio, el parto domiciliario planificado atendido por enfermeras obstétricas según protocolo de atención, exhibió buenos resultados maternales y neonatales, inclusive cuando fue necesario efectuar traslados hospitalarios.

## DESCRIPTORES

Parto domiciliario  
Enfermería obstétrica  
Transferencia de pacientes  
Hospitalización

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## INTRODUCTION

In Brazil, most women are assisted in a hospital when giving birth. Statistical data from the civil registry show that in 2007, 96.9% of births occurred in hospitals<sup>(1)</sup>. A population-based study in 2006 indicated the rates of homebirth attendance in different regions of the country ranged from 0.1% (Southeast Region) to 7.5% (Northern Region), while in the Southern Region, it was 0.2%<sup>(2)</sup>. The women who opt for homebirths are significantly more involved in the labor and delivery, are less anxious and trust more in the physiology of their own bodies than those who choose to deliver in a hospital<sup>(3)</sup>. Homebirth care is associated with fewer interventions and lower rates of a Cesarean delivery. In addition, women giving birth at home are given more control regarding the position choice for delivery, and there is a greater encouragement of breastfeeding and skin-to-skin contact between the mother and newborn<sup>(3)</sup>.

A Dutch study comparing outcomes for homebirths with hospital births considered 529,688 low-risk pregnancies and indicated that homebirth is not associated with increased risk of mortality or perinatal morbidity or admissions of newborns (RNs) into Neonatal Intensive Care Units (NICU's)<sup>(4)</sup>. Studies in Switzerland and Canada obtained similar results<sup>(3,5)</sup> with maternal transfer rates from the home to the hospital between 19.0% and 30.6% and of the newborn of 1.6% to 3.4%<sup>(6-10)</sup>. These indicators come primarily from international studies; however, Brazilian data show similar results, with maternal transfer rates of 20.0% and newborn transfer rates of 1.8%<sup>(11)</sup>. However, the rates vary in different healthcare contexts. It is worth noting that in the Brazilian Normal Childbirth Centers, the maternal transfer rate to a hospital ranges from 5.8% to 11.4% and for the newborn from 1.1% to 12.7%<sup>(12)</sup>.

In Southern Brazil, in the city of Florianópolis, SC, homebirth attendance has been offered by specialist nurse midwives since 2006. These practitioners operate independently and compose the Hanami Team – “the blossom of life” – for planned homebirths<sup>(13)</sup>. This study sought to investigate the intrapartum transfer outcomes for this type of care, the clinical evaluation of these events and to contribute to the planning a reference model for hospital transfers because there is no organized system for this purpose in Brazil. Given this context, the aims of this study were to describe the rate and the causes of intrapartum transfer of women attended by nurse midwives at home and the outcomes of these births at the reference hospital.

## METHODS

This is an exploratory, descriptive, quantitative study using data from a cross-sectional study that evaluated the

results of obstetric and neonatal care of planned homebirths attended by nurse midwives. This study included 100 deliveries from January 2005 to December 2009<sup>(13)</sup>. The sample of the present study consisted of 11 women and their newborns who transferred to a hospital during the planned homebirth, i.e., 11.0% of the participants of the cross-sectional study. The data were obtained from patient records completed by the nurse midwives. The women who choose to give birth at home, assisted by the Hanami Team, seek this type of care during the prenatal period through the recommendation of friends, the prenatal physician or having accessed the Internet website ([www.partodomociliar.com](http://www.partodomociliar.com)). After the initial contact, the women are invited to attend a meeting to become acquainted with the team and the care protocol and to address any concerns.

The women who opt for homebirths are significantly more involved in the labor and delivery, are less anxious and trust more in the physiology of their own bodies than those who choose to deliver in a hospital.

The Hanami Team consists of seven nurse midwives and two obstetricians who provide prenatal care. The homebirth attendance includes activities initiated in the prenatal care and care for the women in childbirth through 10 days postpartum. It is an independent and private service, requiring payment. The pregnant women are evaluated for clinical and obstetric risk according to a care protocol. When the women meet the criteria (low-risk pregnancy with a single fetus, to term and in the cephalic position, and with up to one previous Cesarean section performed at least 2 years prior to the current pregnancy), prenatal care with the nurses is initiated at home at 37 weeks gestation, and the women are attended weekly until delivery. At the first consultation, aspects of the homebirth are addressed that refer to a possible transfer, such as what hospital will be used as the reference (public or private) and whether the prenatal physician will be called to attend her in the institution. In the case of maternal or neonatal transfer, these decisions are respected by the team.

When initiating the transfer, the nurse responsible for the home care initiates telephone contact with the physician who cared for the woman in the prenatal period and with the healthcare institution. Next, the woman (and the newborn, if necessary) is transported in one of the nurses' cars, and in private institutions, the nurse monitors the hospital care. However, in public institutions, such monitoring is not possible, as only the woman's companion can stay with her. The team has basic life support materials for the safety of the woman and newborn until arrival at the hospital, and all nurse midwives periodically participate in training updates<sup>(13)</sup>. The puerperae and the newborns transferred to the institution continue to be assisted in the puerperium by the same nurses who attended them at home. The first consultation is performed at the hospital, and subsequent consultations occur at home on the 3<sup>rd</sup>, 4<sup>th</sup> and 10<sup>th</sup> days

postpartum. A home visit is performed on the 15<sup>th</sup> day of life of the newborn if it fails to reach the birth weight by the 10<sup>th</sup> day of life. During these consultations, the family is provided with guidance on breastfeeding, the Neonatal Screening Test and on the vaccines recommended by the Ministry of Health and supplied by the Primary Health Unit, as well as the Evoked Otoacoustic Emissions test performed in the University Hospital of the Federal University of Santa Catarina<sup>(13)</sup>.

In this study, the variables of interest were classified as the following: sociodemographic; obstetric history; obstetric conditions of the women transferred to the hospital; variables related to the hospital care of the women; and variables related to the newborn. The variables were recorded by the team nurses during care. The data collection was retrospectively performed using a form constructed for the study and completed by one of the researchers with the data from the medical records of the women and from the health booklet of the newborns. The database was developed using EPI-INFO (<http://www.cdc.gov/epiinfo/>), version 2008, and analyzed through descriptive statistics (frequencies and percentages). The study was approved by the Research Ethics Committee (REC) of the Federal University of Santa Catarina. The signed Terms of Free Prior Informed Consent was obtained from the women who were contacted by telephone and letter.

## RESULTS

The transfer rate was 11.0%, and the women were transferred to the hospital during labor. The majority were 30 years of age or older (63.6%), were married or in a stable relationship, had completed a higher education course (54.5%) and performed paid work. Regarding the obstetric data, the majority were nulliparous, more than 80.0% had conducted six or more prenatal consultations with the obstetrician and all had initiated prenatal care with the nurses before the 38<sup>th</sup> week of pregnancy. Of the total of multiparous women (4), only one had performed a previous homebirth (9.1%; Table 1).

Regarding the data on the home labor, the majority of the women presented with a gestational age between 38 and 40 weeks, ≤ 3 cm cervical dilatation at the first evaluation and a stable fetal heartbeat. However, in more than 70.0% of the cases, the tracing of the labor recorded on the partograph crossed the alert line, and less than half of the women experienced a bradysystolic episode. At the time of the transfer to the hospital, almost all the parturients presented with ovular membrane ruptures, with an artificial rupture of the membranes performed in nearly a third of them; one of the parturients presented with meconium-stained amniotic fluid. Stalled cervical dilation, stalled fetal descent and cephalopelvic disproportion were the most common reasons for transfer (Table 2).

**Table 1** - Sociodemographic and obstetric characteristics of the transferred women - Florianópolis, Jan. 2005/Dec. 2009

Variables	N	%
<b>Sociodemographic</b>		
Age in years		
20-24	2	18.2
25-29	2	18.2
30-34	3	27.3
35-39	4	36.3
<b>Marital status</b>		
Stable relationship/married	10	90.9
Single	1	9.1
<b>Schooling</b>		
Complete high school	1	9.1
Incomplete higher education	4	36.4
Complete higher education	6	54.5
<b>Occupation</b>		
Remunerated activity	7	63.6
Student	2	18.2
Housewife	2	18.2
<b>Obstetric</b>		
<b>Parity</b>		
Nulliparous	7	63.6
Multiparous	4	36.4
<b>Type of previous delivery (n=4)</b>		
Vaginal	1	40.0
Caesarean	3	60.0
<b>Place of previous delivery (n=4)</b>		
Hospital	2	60.0
Home	1	20.0
Normal Birth Center	1	20.0
<b>Prenatal consultations with the physician</b>		
≥ six consultations	9	81.8
Not registered	2	18.2
<b>Initiation of prenatal care with the nurse (GA/LMP)<sup>1</sup></b>		
< 38 weeks	11	100.0
<b>Prenatal consultations with nurses</b>		
≤ six consultations	8	72.7
≥ six consultations	1	9.1
Not registered	2	18.2

<sup>1</sup> Gestational age (GA) calculated from the last menstrual period (LMP). Note: (N =11)

Most of the women were transferred to a private hospital and attended by the physician who performed their prenatal care. Nine underwent a Cesarean section due to indications not identified in this study. Of the four multiparous women, three had prior Cesarean sections two years or more previously, and all were again subjected to the procedure (Table 3).

Regarding the neonatal outcomes, over a third of the newborns weighed more than 3,500 grams (54.6%). The majority were classified as adequate for the gestational age (AGA), had a gestational age between 39 weeks and 41 weeks and 6 days, calculated by the method of Capurro, a head circumference greater than 34 cm and obtained Apgar scores ≥ 7 at the 1<sup>st</sup> and the 5<sup>th</sup> minute of life (Table 4).

**Table 2** - Obstetric conditions of the transferred women - Florianópolis, Jan. 2005/Dec. 2009

Variables	N	%
<b>Gestational age (USG)</b>		
38 - 40 weeks	8	72.7
≥ 41 weeks	2	18.2
Not registered	1	9.1
<b>Cervical dilation at 1<sup>st</sup> evaluation</b>		
≤ 3 (cm)	8	72.7
≥ 4 (cm)	2	18.2
Not registered	1	9.1
<b>Fetal heartbeat</b>		
No change	9	81.8
Light bradycardia	1	9.1
Not registered	1	9.1
<b>Crossing of the partograph alert line</b>		
Yes	8	72.7
Curve was not drawn <sup>1</sup>	3	27.3
<b>Functional dystocia</b>		
Absent	5	45.5
Bradyasystole	5	45.5
Not registered	1	9.0
<b>Ovular membrane rupture</b>		
Spontaneous	5	45.5
Artificial	3	27.3
Uncertain <sup>2</sup>	2	18.2
Not registered	1	9.1
<b>Condition of the ovular membranes during transfer</b>		
Ruptured	10	90.9
Not registered	1	9.1
<b>Amniotic fluid condition</b>		
Clear	9	81.8
Meconium	1	9.1
Not registered	1	9.1
<b>Reason for transfer</b>		
Stalled fetal progression	2	18.2
Stalled cervical dilation	2	18.2
Cephalopelvic disproportion	2	18.2
Analgesia requested by the parturient	1	9.1
Maternal exhaustion and need for analgesia	1	9.1
Meconium-stained fluid and stalled cervical dilation	1	9.1
Ruptured amniotic membrane > 16 hours without labor	1	9.1
Procidentia of the member	1	9.1

<sup>1</sup> Parturients were in the latent phase of labor.<sup>2</sup> Cases in which it was not possible to confirm membrane rupture

Note: (N =11)

**Table 3** - Institutional care variables of the women transferred - Florianópolis, Jan. 2005/Dec. 2009

Variables	N	%
<b>Healthcare institution</b>		
Private	7	63.7
Public	4	36.3
<b>Professional who provided care</b>		
Private obstetrician	6	54.5
Obstetrician on duty	3	27.3
Resident	2	18.2
<b>Type of delivery in the institution</b>		
Caesarean	9	81.8
Vaginal with analgesia	1	9.1
Vaginal with forceps and analgesia	1	9.1
Note: (N =11)		
<b>Table 4</b> - Newborn variables of the transferred women - Florianópolis, Jan. 2005/Dec. 2009		
Variables	N	%
<b>Weight (grams)</b>		
3.000 – 3.499	3	27.3
3.500 – 3.999	4	36.4
≥ a 4,000	2	18.2
Not registered	2	18.2
<b>Apgar at the 1<sup>st</sup> minute</b>		
≥ 7	9	81.8
Not registered	2	18.2
<b>Apgar at the 5<sup>th</sup> minute</b>		
≥ 7	9	81.8
Not registered	2	18.2
<b>Capurro</b>		
37 to 38 weeks	1	9.1
39 to 41 weeks	8	72.8
Not registered	2	18.2
<b>Classification<sup>1</sup></b>		
Appropriate for gestational age	7	63.6
Large for gestational age	2	18.2
Not registered	2	18.2
<b>Head circumference (cm)</b>		
32 – 34	2	18.1
> 34	6	54.5
Not registered	3	27.3
<b>Complications up to the 15<sup>th</sup> day<sup>2</sup></b>		
None	3	21.4
Jaundice	5	35.7
Weight on the 10 <sup>th</sup> day less than that of the birth	4	28.6
Not registered	2	14.3

<sup>1</sup> According to the classification of Alexander.<sup>2</sup> Three newborns had more than one complication.

Note: (N =11)

In the puerperium, the majority of the mothers had 4 to 5 postpartum consultations; breast turgidity was the most common complication in this period (54.5%) followed by cracked nipples (36.4%) and breast engorgement (36.4%).

## DISCUSSION

The findings of this study indicate intrapartum transfer rates similar to those found in other studies. The maternal transfer rate was lower than that found in studies conducted in the United States<sup>(10)</sup>, Australia<sup>(6,9)</sup>, the Netherlands<sup>(7)</sup>, Canada<sup>(5)</sup> and Switzerland<sup>(3)</sup>, in which it ranged from 14.0% to 30.6%<sup>(3,5,7,9-10)</sup>. It was also lower than that of a descriptive study performed in Brazil with a sample of 70 women, which showed a transfer rate of 20.0%<sup>(11)</sup>. All transfers occurred in the first clinical period of birth. This finding is similar to other studies, in which the women were transferred during this period in 73.6% to 74.8% of cases<sup>(6-7)</sup>. However, those studies also found that transfers occur in the second clinical period of the birth (12.5% to 15.9%)<sup>(5-6)</sup> and in the postpartum period (1.8% to 9.3%)<sup>(5-6,11)</sup>, which was not observed in the present study. This may be due to the lack of a formal reference and counter-reference system for this type of care in Brazil, where the early transfer is determined to minimize potential maternal and fetal risks, and the small sample size of this study.

The majority of the women had an indication for transfer related exclusively to maternal complications in the dilation period and not due to alterations in fetal well-being, a finding that differs from other studies in which a non-reassuring fetal status was the reason for transfer<sup>(3,7,11)</sup>. The main indications for the transfer of the women were stalled cervical dilation and fetal descent, similar to those indicated in several studies<sup>(8,14-15)</sup>, and cephalopelvic disproportion. The prolonged rupture of the membranes<sup>(8)</sup> and maternal exhaustion with the need for pain relief medication<sup>(11)</sup> are indications for transfer reported by other authors that also occurred in this study to a lesser extent. In the cross-sectional study that led to this study, the majority of the women assisted at home by the nurses were primiparous<sup>(13)</sup>, which was also the case for the women transferred. This is consistent with the findings of international studies that have reported higher transfer rates in this group of women<sup>(3,5,7,10)</sup>. It should be stressed that the transfer rate in nulliparous women may be up to four times higher than in multiparous women, according to reports in studies from Canada<sup>(5)</sup> and the Netherlands<sup>(14)</sup>.

The majority of the women requested assistance while still in the latent phase, which may have negatively influenced the evolution of the labor and resulted in changes in the partograph. This may have caused the indications for Cesarean section when the women were admitted to the hospital. This result corroborates findings from Brazilian hospital where the prevalence rate of Cesarean delivery is higher in women hospitalized with cervical dilation of up to 3 cm<sup>(16)</sup>. Of the total women assisted in the home in this study sample, only 9.0% underwent a Cesarean section<sup>(13)</sup>.

This is lower than the rate of 15% reported by the World Health Organization<sup>(17)</sup> and is congruent with that found in the majority of studies that show percentages between 5.2% and 28.6%<sup>(3,5,8-9,11)</sup>, being more frequent among nulliparous women<sup>(5,14)</sup>. It was observed that not all the transferred women underwent a Cesarean section; those who did, presented with similar sociodemographic characteristics to those assisted at the hospital who underwent the same surgical procedure<sup>(18)</sup>. A cross-sectional study performed in three Brazilian cities revealed that the rate of operative delivery is higher in women of a more advanced age, with the prevalence rate of Cesarean sections among 35 year-old women being twice that observed in those less than 20 years of age. A stable relationship, high levels of education and high number of antenatal consultations were also associated with this surgery<sup>(18)</sup>. It should be emphasized that, in all the multiparous women assisted at home<sup>(13)</sup>, eight had had previous Cesarean sections, and three of them underwent this procedure again. In general, this result can be considered positive because, according to the literature, a previous Cesarean section increases the chance of repeating this procedure in subsequent pregnancies by up to 5 times<sup>(18)</sup>.

Regarding the newborns of the mothers transferred to the institution, just over half had a head circumference (HC) above the expected average, which is approximately 33.5 cm<sup>(19)</sup>. These data were not evaluated in other homebirth studies, although a study on factors associated with the performance of Cesarean sections revealed that a HC  $\geq$  35 cm is associated with higher rates of Cesarean deliveries<sup>(18)</sup>. Concerning the newborns, there were no hospitalizations in the Neonatal Intensive Care Unit among the infants of parturients transferred to the hospital. This finding is similar to those of studies conducted in Australia<sup>(6)</sup> and Brazil<sup>(11)</sup>.

The favorable obstetric and neonatal outcomes presented in this study may have been influenced by the fact that women who choose to give birth at home cultivate positive expectations regarding childbirth and end up having fewer complications than those who choose the hospital<sup>(20)</sup>. The option for most of the women to be transferred to a private healthcare institution and to be attended by the prenatal physician can be attributed to their purchasing power, as the majority had paid employment and higher education levels, as well as the relationship of trust between the parturient and the professional. Furthermore, it is believed that the decision to call the prenatal physician may have been influenced by the fear of being discriminated against by the healthcare professionals who discouraged the planned homebirth. The satisfaction of these women with the birth experience was not evaluated, and the results of other studies investigating this aspect are controversial, as one shows very little effect<sup>(21)</sup>, while another indicates that the intrapartum transfer causes dissatisfaction<sup>(22)</sup>.

The present study has limitations such as the small sample of women, which prevented the performance of statistical tests to verify associations or identify variables predictive of the causes of the transfer, as well as the retrospective data collection. The fact that all the

women assisted by the Hanami Team were also accompanied in the immediate puerperium, regardless of the place of birth, allowed for the determination that the puerperal complications among the women transferred resembled those that gave birth at home<sup>(13)</sup>.

## CONCLUSION

This study does not allow for conclusions regarding the safety of this type of care because that determination requires a representative sample and, above all, prospective data collection. However, the findings of this sample indicate that homebirths, when planned and assisted by qualified professionals, present with good maternal and neonatal outcomes even when there is an intrapartum transfer to the hospital. The transfers were restricted to the first clinical period of the birth and were always due to maternal complications. The Cesarean section rate was not significant, considering the total sample of 100 women from which this study originated. It is noteworthy that even after the transfer, some women were able to deliver vaginally in the hospital. The neonatal results in the hospital show that transfers performed carefully contribute to the welfare of the newborn, which is evidenced by the value of the Apgar scores and by the lack of NICU hospitalizations.

As the majority of births occur in a hospital environment in Brazil, conducting studies with a larger sample size to evaluate the results of homebirth care becomes difficult. In addition, pregnant women who seek homebirths are strongly motivated to have their children in this environment, which hampers the realization of randomized, controlled, clinical trials to evaluate the influence of the place of birth on maternal and neonatal outcomes. Conducting cohort studies with prospective data collection is therefore recommended to evaluate the results of the planned homebirth care, including investigating whether there is an association between home care for women in early labor (with cervical dilatation up to 3 cm), the need for maternal transfer and the performance of a Cesarean section. Qualitative studies are also recommended to investigate how hospital professionals receive women after initiating home attendance, seeking to understand why women prefer to be attended by the prenatal obstetrician in private institutions.

In general, the maternal and neonatal outcomes presented in this study are positive and similar to those in countries where homebirth is performed by midwives integrated into the healthcare system. Such outcomes can contribute to this practice becoming an accessible birthing option that is valued by healthcare professionals.

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