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**SAFETY OF HOME BIRTH: PERINATAL
MORTALITY OVER A 3-YEAR PERIOD IN
GERMANY**

by

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Safety of home birth: Perinatal mortality over a 3-year period in Germany

Abstract

Objectives: to identify main risk groups for perinatal mortality in a home birth setting.

Study question: Should midwives in Germany advise primiparas rather to go to a birth centre than to have a home birth?

Design: Retrospective cohort study

Setting: Out-of-hospital births in Germany.

Population: 13,071 women with singleton pregnancies starting birth at home and 12,044 women with singleton pregnancies starting birth at birth centres in Germany over a period of 3 years (2000-2002).

Methods and main outcome measure: Data was drawn from the documentation sheets of all midwives in Germany who have deliberately committed themselves to participate in a program of documenting every out-of-hospital birth they were called to. Perinatal mortality within the subgroups of primiparas and multiparas was compared to the outcome of the control group. To identify the main source of mortality, the groups were stratified for age of the mother and gestational age in a multivariate analysis.

Key findings: There is no statistically significant difference in the overall perinatal mortality within the two groups of home births and birth centre births (RR 1.3 [95% CI 0.7-2.4]). In the subgroup of primiparas perinatal mortality is higher than in the control group and lower in the subgroup of multiparas, but without statistical significance. When stratified for gestational age, data shows elevated perinatal mortality rates in both subgroups (primiparas: OR 11.6 [95% CI 2.6-52.8] and multiparas OR 26.2 [95% CI 9.6-71.6]) at early labour (< 37 weeks). Differentiating for premature birth, the group of women before week 36+0 cared for is much higher in the home birth group. This might explain the higher perinatal mortality rate.

Implication for practice: The reason why perinatal mortality seems to be higher in the home birth setting than in the birth centre setting has to be discussed. Especially home birth midwives have to follow the call of her client even in early pregnancy. As the number of perinatal mortality rates is quite small in the different subgroups, we have to wait for the data of the following years. Those midwives in charge of constructing the documentation sheets for out-of-hospital births should make sure that the reasons be clearly stated why the midwife has to or wants to help at a preterm birth at home or in a birth centre. Summing up the results, at this point of our knowledge there is no need for midwives in Germany to advise primiparas to go to a birth centre instead of having a home birth.

Safety of home birth:

Perinatal mortality over a 3-year period in Germany

INTRODUCTION

The recent study of Gottval et al (2004) concludes that birth centre care may be less safe for infants of first-time mothers. Their findings show that birth centre care was associated with an increased risk of perinatal mortality in primiparas compared to standard care, but not in multiparas (women having their second or next child).

Starting from these results I follow the study design of Gottvall et al and raise the question: Do we find the same structure on the level of out-of-hospital births in Germany?

There are quite a number of studies (for Germany: Wietrychowski, 1994) and reviews (latest review: Olsen, 2004) comparing the outcome of mother and child for home birth versus hospital birth. Some studies were undertaken to compare the results of births at birth centres and hospitals (for Germany: David et al, 1999). One of the reasons for choosing the comparison with hospital births may be the small number of overall out-of-hospital births. More convincing as a reason may be the wish to argue against or in favour of out-of-hospital births – as it is obvious for the controversies concerning the Australian (Bastian et al, 1998 vs Tracy, 1998) or the recent Irish study (McKenna and Matthews, 2003 vs Macfarlane, 2004).

Comparing cohorts within the group of out-of-hospital births in one country is not yet often done. This is the first study including the largest number of out-of-hospital births ever analysed in Germany.

We can presume that women of the two cohorts in this study (home birth group and birth centre group) have nearly the same attitude towards natural childbirth and the

same believe in their own ability to bear a child – factors that obviously differ from women choosing hospital birth as Waldenström and Nilsson (1993) found for Swedish women and Wietrychowski (1994) for German women.

Although nearly all out-of-hospital births in Germany are based on a philosophy of encouraging natural childbirth, the setting of home birth is a special one: Only those women with nearly no risks in pregnancy should plan to give birth at home. In contrast to the home birth setting, the birth centres are mostly located at places with a hospital in short distance of reach. Women with a wider range of risks may be accepted at these institutions, with the consequence of having a higher rate of transfers to hospital during birth (15.5% of all births started at a birth centre) than the home birth group (10.8% of all births started at home) as seen in Figure 1. Normally midwives working in a birth centre use slightly more technical equipment like a cardiotocograph apparatus than do midwives working in a home birth setting.

STUDY QUESTION

Should midwives in Germany advise primiparas rather to go to a birth centre than to have a home birth?

DESIGN OF THE STUDY

To answer this question the study focuses on perinatal mortality as the outcome factor. Data is drawn from the documentation sheets of all midwives from all parts of Germany who have – in most of the Federal States deliberately – committed themselves to participate in the program of documenting every out-of-hospital birth they were called to in the years 2000, 2001 and 2002. This program is initiated by midwives of QUAG e.V., Association for the Quality of Out-of-hospital Births. The

number of documented out-of-hospital births makes up 75% of all out-of-hospital births in Germany¹.

This observational study was designed as a retrospective cohort study. Only those women who started birth at home entered the home birth group (n=13,071) as the study group and only those starting birth in a birth centre found their way into the birth centre group (n=12,044) as the control group (n=13,071) of this study (together: n=25,175) – no matter whether or not they were transferred to hospital intrapartum or postpartum (see Figure 1). Twin pregnancies were excluded (no perinatal mortality within these births). Another 34 births had to be excluded for there was either no data on the age of the mother, the parity or the gestational week of birth (no perinatal mortality within these cases).

Only 17 cases (0.07%) were documented so poorly that it is not clear whether or not the child survived up to 7 days after birth².

Similarities of the two groups and their subgroups are identified concerning the study factors age, length of gestation, mode of delivery and infant birthweight by descriptive statistics and the Independent Samples T Test.

Perinatal mortality is compared within the groups and subgroups. To identify the main source of mortality the groups are stratified for age of the mother and gestational age in the Multinomial Logistic Regression Analysis of SPSS.

¹ As there are no official data concerning the overall number of out-of-hospital births in Germany, it can only be assumed by subtracting the number of hospital births from the total number of births in Germany, that the rest left could be the number of out-of-hospital births, considering the number of transfers to hospital we know of (see Qualitätsbericht, 2001, 2002 and 2003).

² Nine of these cases belong to the homebirth group, 4 out of those concern primiparas delivering at date, 3 were 25-35 years of age, 1 was over 39 years old. Two of them delivered at a clinic (one by Caesarean section, one by vaginal operation). For 3 infants there was no entry for any of the Apgar-scores (1 minute, 5, minutes, 10 minutes pp), one infant born at home had 8/10/10. Nearly the same is true for the 5 primiparas in the birth centre group, except that there was one more child with an Apgar-score of 9/10/10.

RESULTS

Although the two groups – as seen in Table 1 under “All” – nearly have the same size and number of percentage in the three age categories and in the four categories for gestational age, the *P* value only indicates a similarity in late pregnancies (for more than 42 weeks: *P*=0.952).

Looking at the subgroups the percent of primiparas and multiparas differ enormously between the two groups: In the home birth group only 25% are primiparas compared to 47% of primiparas in the control group.

Caesarean sections and instrumental deliveries were more often performed in the birth centre group. This difference is especially high for primiparas.

For all births in both groups (home birth group and birth centre group) the expected date of delivery was either estimated from the exact date of the last menstruation or from the results of ultrasound examinations.

The two subgroups of primiparas are comparable in the age structure and in the structure of the gestational age when giving birth – with one exception: The part of primiparas giving birth at an early time in pregnancy is larger in the home birth group (1.6%, *P*=0.012). This is not the case when comparing multiparas. The difference concerning early pregnancy is not reflected in the group of low birthweight: For infants with a birthweight under 2.500 grams the two groups and the subgroups are similar.

As both groups consist only of women starting an out-of-hospital birth, both cohorts have a very low perinatal mortality rate of 0.15%³. As seen in Table 2, the rate of perinatal mortality in the home birth group is slightly higher (0.17%) compared to the control group (0.13%) but without statistically significant difference (RR 1.3 [95% CI

³ For comparison: the perinatal mortality for all 68,029 children born in Lower Saxony in the year 2002 was 0.53% (Qualitätsbericht Niedersachsen, 2003).

0.7–2.4]). Also, in the subcategories of perinatal mortality, namely death before birth (24 weeks of gestation up to the beginning of labour), death intrapartum and death postpartum (0–6 days after birth) mortality rates are similar in both groups.

Mortality rates in all categories seem to be higher with primiparas in the home birth group than in the control group where as the opposite tendency seems to be true for multiparas. Although there is still no statistically significant difference in all the categories of the subgroups it has to be pointed out that the number of deaths 0–6 days post partum is twice as high in the home birth group (6 cases or 0.19% of all births starting as home births within the group of primiparas) than in the control group (3 cases or 0.05% of all births starting as birth centre births within the group of primiparas).

The relation of perinatal mortality in the subgroups of primiparas and multiparas stays the same when adjusted for maternal age and week of gestation. As maternal age is not significantly associated with perinatal mortality in this study (Maternal age over 35 might be a risk within the group of primiparas (OR 3.9 [95% CI 1.3 – 11.2]) but not highly significant), perinatal mortality in Table 3 is only adjusted for the length of gestation. Gestational week that is lower than 37 is associated with a highly significant risk for perinatal mortality in both subgroups. In the group of primiparas, there were 2 cases (both cases occurred in the home birth group) with OR 11.6 [95% CI 2.6 – 52.8]. In the group of multiparas there were 5 cases (three in the home birth group, two in the birth centre group) with OR 26.2 [95% CI 9.6 – 71.6]. Due to small numbers and stratification, the CI in both groups is quite wide.

In order to learn more about these seven births, Table 4 shows three different periods of preterm gestation. Considering only primiparas: Half of the perinatal mortality rate

in the home birth group happened at a time in gestation (before week 33) when midwives in the birth centre group did not deliver any woman. Consequently death could not happen. With 1 perinatal death in each group in the period of week 36+0 to 36+6 (home birth: $n=41$, birth centre: $n=77$), the OR would still be 1.9, but we do not know if the perinatal mortality rate would increase with a raising number of n in the home birth group.

DISCUSSION

The results presented in this study are limited by the fact, that in 17 cases (0.07%) mortality can not be clearly excluded because of data not accessible within the time period of the master thesis. In addition, data sets are not yet large enough for high significance, but will be in the future.

In Table 2 data seems to indicate that is more probable to experience any kind of perinatal mortality being a primipara deciding for a home birth than being a multipara with the same intentions. Especially death within 6 days post partum would be of higher probability. When birth starts the 37th week or earlier, primiparas at home are the most vulnerable (Table 3). However, we do not know if the same women would be better off elsewhere.

But there are more reasons for questioning the results: Going more into detail it becomes obvious that a midwife in a home birth setting is more likely to come to her clients when they complain of early labour. When labour already started before week 36+0, she will document the case and it will enter the home birth group. In this study, 49 cases before week 36+0 are observed in the home birth group, in contrast, only 22 cases are part of the control group (see Table 4). Qualitative studies might find out more about the underlying philosophy or hazards. The documentation sheets of all 7 births state that birth was planned at the place where it started, but we have no

information whether or not this plan was only valid for a delivery at the expected date of birth. Further we do not know if the birth of a fetus with a life threatening disease was planned at home in order to let the child die in a “natural” way – this may be no option for the birth centre and could be a confounder for this study⁴.

Implication for practice: Midwives working out-of-hospital are surely aware that perinatal mortality is strongly associated with preterm birth. For researchers this study might show that it is not wise to build such large categories like “24–36 weeks of gestation” as the risk of dying rises enormously for each week lost. Those midwives in charge of constructing the data sheet for documenting out-of-hospital births should make sure that the reasons why the midwife has to or wants to care for the mother in labour at home or in a birth centre can be clearly stated. Summing up the results, at this point of our knowledge there is no need for midwives in Germany to advise primipara not to have a home birth.

Under public health view, perinatal mortality in premature infants of out-of-hospital births is not of great importance as the number of children saved is small. But looking at the broader perspective it reveals that premature birth is the outstanding cause of death in perinatal mortality in Germany⁵. Looking at these cases in out-of-hospital births in detail can ameliorate the whole management of premature birth – for cooperation of all childbirth institutions is the only way to help mother and child.

⁴ We know of cases as documented in the film „Mein kleines Kind“(My small child) by Katja Baumgarten (2001).

⁵ The perinatal mortality for children born in Lower Saxony at week 32-36 of gestation in the year 2002 was 1.24% and therefore more than double of the overall perinatal mortality (Qualitätsbericht Niedersachsen, 2003).

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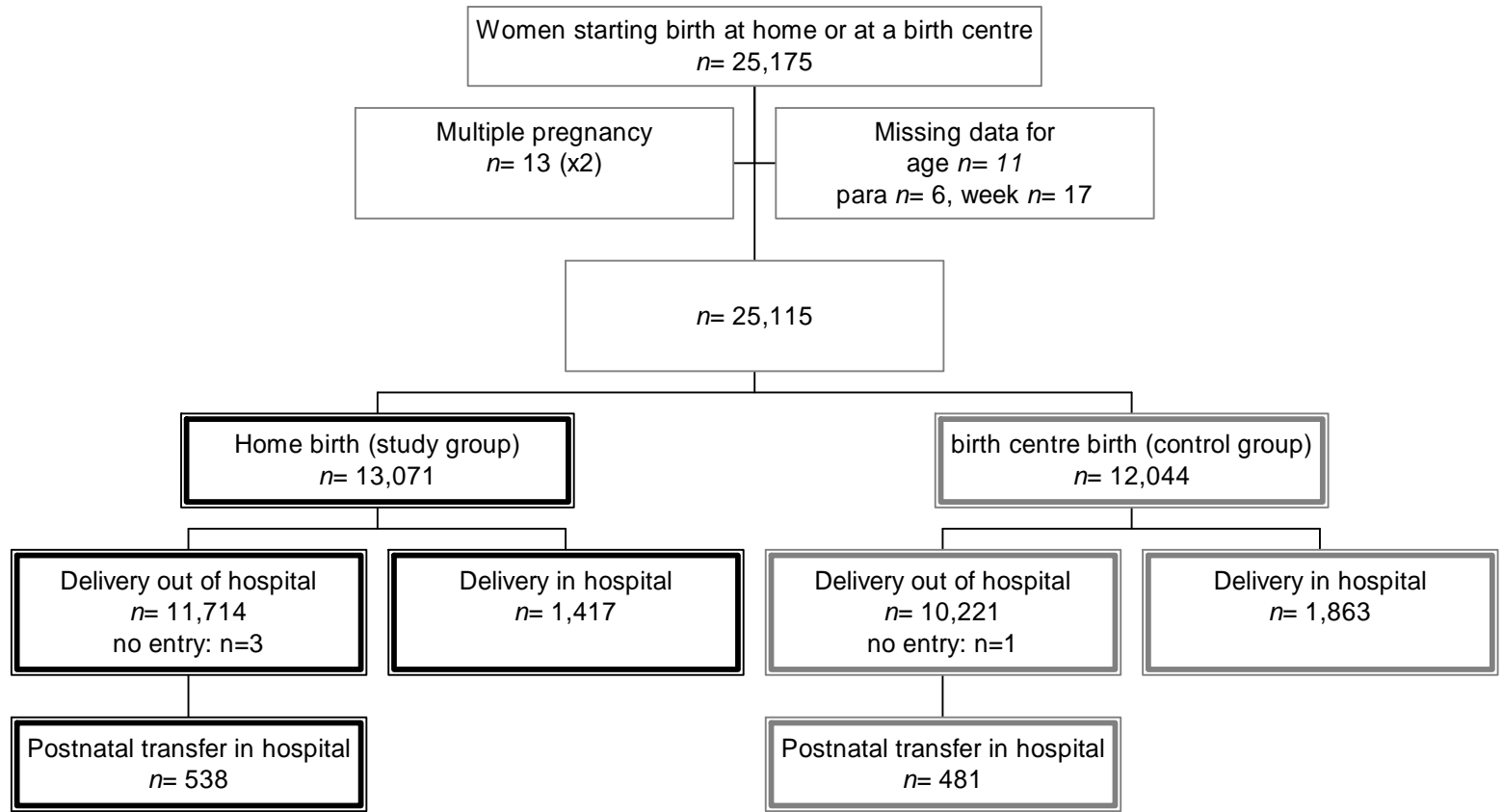


Fig.1. Women started birth at home or in a birth centre 2000-2002, Germany

Figur 1

Table1. Obstetric data of women in the home birth group and birth centre group 2000-2002. Figures indicate percentages.

	All			Primiparas			Multiparas		
	home birth (n=13,071) %	birth centre (n=12,044) %	<i>P</i>	home birth (n=3217) %	birth centre (n=5627) %	<i>P</i>	home birth (n=9854) %	birth centre (n=6417) %	<i>P</i>
Age									
<25	6.3	8.4	<0.001	14.9	14.0	0.250	3.4	3.5	0.849
25-35	67.1	71.4	<0.001	71.0	72.0	0.343	65.7	70.9	<0.001
>35	26.7	20.2	<0.001	14.1	14.1	0.943	30.8	25.6	<0.001
Length of gestation (weeks)									
22-36	1.3	1.0	0.022	1.6	1.0	0.012	1.1	0.9	0.149
37-40	78.4	77.0	0.006	75.0	75.1	0.925	79.5	78.7	0.184
41	17.5	19.2	<0.001	19.9	20.6	0.432	16.7	18.1	0.028
42+	2.8	2.8	0.952	3.5	3.3	0.669	2.5	2.3	0.352
Caesarean section	2.8	5.5	<0.001	7.7	9.5	0.004	1.2	2.0	<0.001
Instrumental vaginal delivery	1.5	2.7	<0.001	4.9	5.1	0.723	0.4	0.6	0.014
Infant birthweight (grams)									
<2500	0.8	0.7	0.051	1.3	1.0	0.193	0.7	0.4	0.047
>4500	2.3	2.1	0.095	1.4	1.2	0.519	2.6	3.3	0.405

Table 1

Table 2. Fetal and infant deaths in the home birth group and birth centre group (2000-2002). Values are given as n (%) and RR [95% CI].

	All			Primiparas			Multiparas		
	home birth (n=13,071) n (%)	birth centre (n=12,044) n (%)	RR [95% CI]	home birth (n=3217) n (%)	birth centre (n=5627) n (%)	RR [95% CI]	home birth (n=9854) n (%)	birth centre (n=6417) n (%)	RR [95% CI]
Death before labour	5 (0.04)	5 (0.04)	0.9 [0.3–3.2]	2 (0.06)	1 (0.02)	3.5 [0.3–38.6]	3 (0.03)	4 (0.06)	0.5 [0.1–2.2]
Death intrapartum	4 (0.03)	4 (0.03)	1.2 [0.3–4.3]	1 (0.03)	2 (0.03)	1.7 [0.1–28.0]	3 (0.03)	2 (0.03)	1.0 [0.2–5.8]
Death postpartum 0-6 days	14 (0.11)	8 (0.07)	1.6 [0.7–3.8]	6 (0.19)	3 (0.05)	3.5 [0.9–14.0]	7 (0.07)	4 (0.06)	1.1 [0.3–3.9]
Perinatal mortality ¹	22 (0.17)	16 (0.13)	1.3 [0.7–2.4]	9 (0.28)	6 (0.11)	2.6 [0.9–7.4]	13 (0.15)	10 (0.19)	0.8 [0.4–1.9]

¹ Perinatal mortality: All infants > 500g stillborn or dead within 7 days after birth.

Table 2

Table 3. Perinatal mortality in the home birth group and birth centre group (2000-2002) adjusted for gestational age.

	All					Primiparas					Multiparas				
	<i>n</i>	<i>incidence of perinatal deaths</i>	<i>OR</i>	<i>95% CI</i>	<i>P</i>	<i>n</i>	<i>incidence of perinatal deaths</i>	<i>OR</i>	<i>95% CI</i>	<i>P</i>	<i>n</i>	<i>incidence of perinatal deaths</i>	<i>OR</i>	<i>95% CI</i>	<i>P</i>
Model of care															
birth centre	12,044	16	Ref	Ref	Ref	5627	6	Ref	Ref	Ref	6417	10	Ref	Ref	Ref
home birth	13,071	22	1.2	0.6-2.3	0.563	3217	9	2.5	0.9-7.0	0.085	9854	13	0.8	0.3-1.8	0.613
Gestation (weeks)															
24-37	284	7	20.0	8.7-46.0	<0.001	111	2	11.6	2.6-52.8	0.002	173	5	26.2	9.6-71.6	<0.001
37-41	24,132	30	Ref	Ref	Ref	8432	12	Ref	Ref	Ref	15,700	18	Ref	Ref	Ref
≥42	699	1	1.2	0.2-8.5	0.890	301	1	2.3	0.3-17.8	0.422	398	0	undef.		undef.

Table 3

Table 4. Perinatal mortality in the home birth group and in the birth centre group (2000-2002) of births less 37 weeks of gestation. Values are given as n (n).

Gestational week	Primipara		Multipara	
	homebirth incidence of perinatal death (of all births in this category)	birth centre incidence of perinatal death (of all births in this category)	homebirth incidence of perinatal death (of all births in this category)	birth centre incidence of perinatal death (of all births in this category)
before 33+0	1(2)	0 (0)	0 (1)	0 (0)
33+0 – 35+6	0 (10)	0 (14)	3 (36)	0 (8)
36+0 – 36+6	1 (41)	1 (77)	0 (44)	2 (51)

Table 4

Eidesstattliche Versicherung

Ich versichere hiermit an Eides statt, dass ich die vorliegende Arbeit ohne unzulässige Hilfe Dritter selbstständig verfasst und nur die angegebenen Quellen und Hilfsmittel benutzt habe. Wörtlich oder dem Sinn nach aus anderen Werken entnommene Stellen sind unter Angabe der Quelle kenntlich gemacht.

Die Arbeit wurde bisher weder im In- noch Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt.

Lübeck, 26. August 2004

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