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Early discharge following birth – What characterises mothers and newborns?



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ABSTRACT

Background: Early postnatal discharge has increased over the past 50 years and today we lack the knowledge on who is discharged early that would allow us to improve quality of postnatal care. The aim of this study was to describe maternal and infant predictors for early postnatal discharge in a country with equal access to health care.

Methods: An observational study of 2786 mothers, recruited in pregnancy was conducted from April 2013 to August 2014 in four of the five regions in Denmark. Data were analysed using Kaplan–Meier method and multinomial regression models. Outcome variable was time of discharge after birth.

Results: In total 34% mothers were discharged within 12 hours (very early) and 25% between 13 and 50 hours (early), respectively. Vaginal birth and multiparity were the most influential predictors, as Caesarean section compared to vaginal birth had an OR of 0.35 (CI 0.26–0.48) and primiparous compared to multiparous had an OR of 0.22 (CI 0.17–0.29) for early discharge. Other predictors for early discharge were: no induction of labour, no epidural painkiller, bleeding less than 500 ml during delivery, higher gestational age, early expected discharge and positive breastfeeding experience. Smoking, favourable social support and breastfeeding knowledge were significantly associated with discharge within 12 hours. Finally time of discharge varied significantly according to region and time of day of birth.

Conclusions: Parity and birth related factors were the strongest predictors of early discharge. Psycho-social predictors indicate that the parents are involved in the decision of when to be discharged.

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Introduction

Since hospitalisation of childbirth became the norm in the 40s–50s, there has been a worldwide tendency to reduce length of hospitalisation after birth [1,2] and today the typical length of stay for mothers who had a vaginal delivery without complications is 2–3 days [2]. However, discharge within a few hours after birth is not uncommon nowadays [3]. A Cochrane study of early postnatal discharge and a recently published review states that current definitions of early postnatal discharge vary between 12 and 96 hours postnatal [1,4].

Sparse knowledge exists on mothers and infants who are discharged early today, despite that this group has expanded dramatically during the past 10–15 years. It is a prerequisite to know the target group when designing interventions and prioritising re-

sources in health care as lack of knowledge might impede the effectiveness of intended improvements in quality of care [5]. Observational studies of factors associated with early discharge found during a literature search were all published in the beginning of the new millennium with data collection in the late 90s [6–8]. They showed early discharge to be associated with multiparity [6–8], advanced maternal age [7], European American ethnicity [6,8], normal vaginal birth, birth weight within the normal range (2500–5000 g), term gestational age (38–40 weeks) [7] and formula feeding of the infant at discharge [7,8]. Moreover, lower maternal income [6], public payment [8] and lower community level deprivation score have been significantly associated with early discharge [5]. Several of today's postnatal care guidelines mirror these observational studies and describe mothers and infants who are discharged early in uniform terms as healthy mothers with an uncomplicated vaginal birth of a term infant [9–11]. However, several recent studies point out that mothers giving birth by Caesarean section [12], mothers of late preterm infants [13] and socio-economically challenged mothers [14] are also sometimes discharged early postnatally. No studies of characteristics include psycho-social factors related to breastfeeding,

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although breastfeeding guidance is an important part of the global recommendations for postnatal care [10].

In Denmark women are offered antenatal care visit by a midwife or doctor at the public hospitals during pregnancy and 98–99% give birth at a public hospital [15]. However, recommendations for the length of postnatal hospital stay vary according to the regional authority that is responsible for the hospitals in the five Danish Regions. This study aims to describe demography, health, parity, birth, and psycho-social characteristics of mothers and infants according to length of postnatal hospitalisation in a country with equal access to health care.

Method

Design, setting, and participants

Data were collected in April 2013 to August 2014 as part of a cluster randomised study, which aimed to develop, implement, and evaluate a hospital based breastfeeding support programme for healthy mothers and infants, who were discharged early postnatally.

The study included 9 out of the 22 maternity units in Denmark, located in four out of the five Regions. One region was not represented due to lack of resources at the maternity units. The maternity units included one with the highest level of specialisation, five intermediate and three basis level of specialisation [16], and covered both rural and urban areas. The annual number of deliveries at the hospitals varied between 500 and 3000. Participants were recruited at the regular antenatal care visit with the midwife, scheduled around 35th–36th week of gestation. Women were eligible if they expected a single healthy infant, intended to breastfeed, and had sufficient Danish language skills to understand written information on the project and complete self-administered questionnaires. Exclusion criteria were: mothers who were definitely expected to be discharged more than 50 hours postnatally due to complications in pregnancy or clinical disease. A total of 3541 women were included and contactable in the main study. Of these 2786 women were included in the present study (Fig. 1).

Data collection

Data were collected by two web-based self-administered questionnaires. Mothers were emailed a personal link and completed the questionnaires online at time of recruitment and five to seven days postnatally. The first questionnaire included questions about socio-demographic factors, reproductive experience, social support, breastfeeding experiences/intentions and expected length of postnatal hospital stay. In the second, mothers were asked about the birth, the initial breastfeeding experiences, and time of discharge. Non-responders received up to three reminders together with an SMS alert to reduce the number lost to follow up. The questionnaires primarily consisted of instruments which had earlier been tested for comprehension and acceptability [17]. The questionnaires for the present study were reviewed by three experts in perinatal nursing and research methodology and tested for comprehension and acceptability by 3 primiparous and 3 multiparous mothers with different demographic background using. To describe possible systematic selection mechanisms we used data from the Danish National Patient Register and the Danish Medical Birth Register [18].

Measures

Time of discharge since birth was the outcome variable, defined as completed hours between time of birth and time of postnatal discharge. The variable was calculated from the mothers' report of date/time of birth and discharge, and categorised into: within 12

hours postnatally (very early discharge), between 13 and 50 hours (early discharge) and more than 50 hours postnatally (late discharge). We used the cut-off of 50 hours postnatally since many parents stay at the hospital until the biochemical screening for congenital disease of the newborn is performed, which is 48 hours after delivery at the earliest. The cut point of 12 hours was chosen for the very early discharge as one of the involved regions had changed their policy recently and recommended primiparous as well as multiparous mothers to be discharged within 12 hours postnatally. However, discharge is not uncommon within six hours. We therefore also performed analyses where we sub-divided the within 12 hours group into 6 hours or less and 7–12 hours postpartum. The self-reported characteristics include socio-demographic, maternal health, birth, and parity, psycho-social and geographic factors and categorisation of these are given in Table 1.

Statistical analysis

Initially, associations between time of discharge and study variables were analysed separately by Chi square test. Subsequently, survival curves were calculated and accompanied by log rank test for the two significantly strongest variables (parity and mode of delivery) by the Kaplan–Meier method to visualise the difference over time between sub categories. We used multinomial logistic regression models to estimate the association between characteristics and time of discharge. The discharge group “>51 hours post partum” was the reference group. In model 1 we *a priori* adjusted for potential socio-demographic confounders (age, education, marital status, and ethnicity) and main visitation factors for early discharge (region of birth, mode of delivery and parity). In model 2 all significant factors from model 1 except parity were included simultaneously together with the demographic variables age, education, and ethnicity. As parity and breastfeeding experience both included the sub-category primiparity, we used breastfeeding experience as a proxy for parity and in the analysis of parity we omitted breastfeeding experience due to multicollinearity. The reference group for each of the examined characteristics was the subcategory with the highest total frequency in order to get the most robust model as possible [19]. Results are given by odds ratios with 95% confidence interval and the level for statistical significance was defined as a two sided P value less than 0.05. The Stata software was used for statistical analysis.

Results

A total of 3541 women received the first questionnaire and 2786 of these (79%) were included in the study population (Fig. 1). Analyses of the selection processes showed that only 45% of women giving birth at the nine hospitals were assessed for being eligible. The length of postnatal hospitalisation and maternal age were similar between the mothers assessed vs. not assessed for eligibility, but other characteristics showed a tendency towards more healthy mothers and infants in the assessed group (more vaginal births, higher birth weight, lower BMI and more non-smokers). The 8% who declined to participate were more often smokers and although not significantly different there was a tendency that the women accepting the invitation were more often primiparous, had BMI within the normal range and discharged within 2 days postnatally (Online Supplementary Tables S1 and S2).

Table 1 shows the initial analysis of characteristics according to time of discharge. Around one third of the mothers (n = 934) were discharged very early and of these very early discharged mothers 85% were discharged six hours or less following birth. One fourth (n = 686) were discharged early postnatally, i.e. almost 60% (n = 1620) were discharged within 50 hours postnatally. Time of discharge varied between the four regions and time of day of birth. Higher maternal age was associated with very early discharge, whereas

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