

**Original article:**

**Neonatal outcomes and neonatal care received by the term neonates following initial hospital discharge in Sri Lanka**

*Gunawardane DA<sup>1</sup>, Dharmaratne SD<sup>2</sup>, Rowel DS.*

**Abstract**

**Objectives:** The main aim of this study was to describe the neonatal outcomes of term neonates following initial hospital discharge. **Methods:** This is a descriptive cross sectional study done among term neonates discharged from Teaching Hospital (TH) Kandy from 27<sup>th</sup> of March to 14<sup>th</sup> of May 2015. All the term neonates who delivered at term in the TH Kandy during the study period were included in the study. Study was conducted as a telephone survey. **Results:** Nearly half (46.79%) of the mothers sought medical advice for their neonates following hospital discharge during the neonatal period. Majority of the mothers who sought medical advice (71.06%) went to ordinary doctors while 28.43% consulted specialist doctors. All most all women (98.10%) exclusively breast fed their newborn baby. Four percent of the term neonates were hospitalized during the neonatal period and most common reasons for admission was breathing difficulty followed by yellow discoloration of the body. Considerable proportion (29.66%) of mothers stated that postnatal visits were not helpful for any of the six aspects of postnatal care questioned in the telephone interview. Postpartum visits had its highest impact on breastfeeding followed by maternal competence on recognizing danger signs. But post-partum visit had its least impact on keeping baby warm and dressing up of baby. **Conclusion:** Nearly half of the mothers seek medical advice for their neonates following hospital discharge during the neonatal period. One third of the mother stated that postnatal visits were not helpful for any of the six aspects of postnatal care studied. Postpartum visits had its highest impact on breastfeeding followed by maternal competence on recognizing danger signs while had its least impact on keeping baby warm and dressing up of baby.

**Keywords:** Neonates; Neonatal outcomes care seeking Postpartum visits

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**Introduction**

Decline trend was noted in length of stay for postnatal mothers and neonates worldwide due to the influence of social, financial and other factors<sup>1</sup>. Discharge and follow up policy adopted by Sri Lanka is to discharge the normal baby (Period of Amenorrhoea>37 weeks and/or Birth Weight $\geq$  2.5 kg) after 24 hours of birth and refer them to the postnatal clinic at the MOH office at 4-5 weeks. For the neonates with Period of Amenorrhoea(POA) < 37 weeks and/or Birth Weight(BW)< 2.5kg the minimum hospital stay will

be 48 hours followed by a well-baby clinic visit at 2 weeks or before depending on the condition of the baby. Babies discharged after 2 weeks of age will be referred to the high-risk clinic. In other situations time of discharge will be based on condition of the mother and the baby<sup>2</sup>.

The reasons for readmission neonates following initial hospital discharge has been extensively studied. Main reasons for admission in a study that included near term infants readmitted in the first two weeks of life were infection (40.7 %),

1. Damitha Asanga Gunawardane, Post MD Trainee in Community Medicine, Department of Community Medicine, Faculty of Medicine, University of Peradeniya. Sri Lanka.
2. Samath D Dharmaratne, Professor in Community Medicine and Consultant Community Physician, Department of Community Medicine, Faculty of Medicine, University of Peradeniya. Sri Lanka.
3. Dhammadica. S.Rowel Consultant Community Physician, National Programme Manager,Intranatal and Newborn Care Unit, Family Health Bureau, Ministry of Health, Sri Lanka

**Correspondence to:** Dr. Damitha AsangaGunawardane, 17, Hansa Sevana, Sooriyagoda, Muruthalawa. Sri Lanka. 20232. Email – [damithagunawardane@gmail.com](mailto:damithagunawardane@gmail.com)

hyperbilirubinemia (39.1 %), and feeding and/or gastrointestinal problems (10.5 %). And there was a difference observed in the admissions in the first week and second week separately; In the first week, 65.1% of readmissions were due to hyperbilirubinemia and 19.1% were due to infection or suspected sepsis and in the second week, it was the other way round, 67.8% of readmissions were due to infections and only 7.6% were for hyperbilirubinemia<sup>3</sup>.

Gupta et al.<sup>4</sup> done a study among neonates discharged within 48 hours of delivery. Sample consisted of 97.4 percent term neonates. As they reported hospital readmission rate was 1.86 percent (16 neonates) and jaundice (n=9) and suspected sepsis (n=7) were the main causes of readmissions. Another study conduct in a similar kind of study group (n=478), reported 7.9 percent admissions mainly due to neonatal jaundice<sup>5</sup>. Similar observation by the Society of Obstetricians and Gynaecologists of Canada, has led to the conclusion that early postnatal discharge (less than 48 hours postpartum) from hospital increases the risk of neonatal morbidity and mortality and it is more so for, primiparous, younger, single women. Further, they appreciate the importance of follow up programmes in the community to reduce the neonatal mortality, morbidity, and readmissions.<sup>6</sup>

There is a paucity of data from the South Asian region with regard to neonatal morbidities. In the available studies also it was shown that care seeking is low for newborn illness, especially in terms of care sought from health care facilities and medically trained providers<sup>7</sup>. Study from Bangladesh among 1511 women who had live births during January 1996-August 1998 in four rural sub districts reported fever as the commonest morbidity (21 %), followed by breathing difficulty (11 %)<sup>8</sup>. Eighty-seven per cent of the mothers of ill neonates sought care for their newborns and commonest service providers were homeopaths (38 %) and village doctors (37 %). This pattern of care seeking would be different in Sri Lanka where qualified medical officers are available up to the smallest level of hospital (Primary care units and Divisional hospitals). Study done in India to assess the health care seeking for newborn danger signs among mothers in peri-urban Wardha, found that 37.5% (n=72), babies were sick during newborn period and poor sucking(15.3%) and difficulty in breathing (11.1%) emerged as the leading causes<sup>9</sup>.

Bashour et al.<sup>10</sup> conducted a study to explore the effect of postnatal home visits on maternal and infant outcomes and reported that, while post-partum visits significantly increased exclusive breastfeeding, it did

not have change any of the other aspects of postnatal care. Further they suggest to conduct studies in nonmedical context to find innovative approaches to improve postnatal care. The main aim of this study was to describe the neonatal outcomes of term neonates following initial hospital discharge.

### **Methods**

This is a descriptive cross sectional study done among term neonates discharged from TH Kandy from 27<sup>th</sup> of March to 14<sup>th</sup> of May 2015. All the term neonates who delivered at term in the TH Kandy during the study period were included in the study. Preterm neonates were not included in this study, since they are any way prone develop complication following hospital discharge due to various reasons. Study was conducted as a telephone survey.

Due to non-availability of reliable estimate to be used in this setting, with the assumption of 50% prevalence of outcomes and to obtain a precision of 5% at 95% confidence level 385 study subjects were needed for this study<sup>11</sup>. Telephone surveys focused on health related variables found to have considerable variation in the response rate from 39 to 69 percent<sup>12-15</sup>. With allowance of 50%, nonresponse rate in present study 770 subjects were recruited for this study component to ensure 385 participants.

Data collection was done by telephone interview by two pre-intern doctors usingpretested questionnaire. This questionnaire was consisted of information on pattern of reported neonatal morbidity, care seeking behavior, type of facilities used, and level of domiciliary care received as reported by the postpartum mothers.

With the consent of the participant the interviewer completed the contact form "Contact information for the phone interview" before discharge. Contact information included; any telephone number/s (fixed line or mobile number) and convenient time to conduct the phone interview. Separate two time slots were requested for weekdays and weekends. Since copy of the information sheet was given to all the study participants, women who did not need to undergo this telephone interview could opt out by contacting the principal investigator through given contact number. Telephone interviews were conducted during the period of 29<sup>th</sup> to 35<sup>th</sup> day following delivery for the term neonates who have been already discharged from the hospital. Non response was considered when they could not be contacted after 5 attempts on alternate times and days. If two numbers are available the both numbers were dial in one attempt, if not responded to the first number. Incoming calls to

the designated numbers were not answered and those numbers were immediately redialed to avoid any call charges for the participants of the study.

“Reported neonatal morbidity” was defined as hospitalizations of the neonate due to any presenting complaint reported by the mother or care giver.

Data entry was done by using Microsoft Access. Data analysis was performed by using Statistical Package for the Social Sciences (SPSS) software. Continuous variables were summarized with means and standard deviations or medians and interquartile range as appropriate. Percentages were used to describe categorical variables. Pattern of reported neonatal mortality, morbidity, type of facilities used and level of domiciliary care received were described in relation to the maternal and neonatal characteristics.

**Ethical Clearance** – Obtained from Faculty of Medicine, Colombo, Sri Lanka

### **Results**

This section will describe the findings of the telephone interview conducted with the mother during the 5<sup>th</sup> week (From 29 to 35 days) of postpartum period. Convenient consecutive sample of 770 neonates who discharge from TH Kandy were recruited. Only the neonates of mothers who consented for the telephone interview were recruited for the post-natal telephone survey. From the 770 mothers who were initially recruited before discharge from hospital, only 57.4 (n=442) percent of mothers could be contacted. But 21 (2.72%) mothers refuse to participate the study, hence only 421 (54.7%) of mothers participated the study and completed the telephone interview.

### **Care seeking behavior**

Nearly half (n=197, 46.79%) of the mothers had seek medical advice for their neonates following hospital discharge. Out of mothers who have sought medical advises 71.06 percent (n=140) went to ordinary doctors while 28.43 percent (n=56) consulted specialist doctors (Table 1).

**Table 1: Distribution of Neonates in the Survey by the Care Seeking Pattern**

Care provider	Frequency	Percentage
Specialist Doctor	56	28.43
Ordinary Doctor	140	71.06
Public Health Midwife	22	11.16
Total	197	*

\* Columns are not sum to 100% because mothers may have sought medical advice from more than one care provider.

### **Breast feeding practice**

Women were asked what they had been giving their baby during last 24 hours. All most all women (413, 98.10%) exclusively breast fed their babies. Only 1.43 (n=6) percent of mothers gave formula milk in addition to breast milk. Out of these 6 mix fed babies, one has had a hospital admission and 4 had sought medical advice either from a specialist doctor or from an ordinary doctor. Two babies had received water and coriander water in addition to breast milk.

### **Reported neonatal morbidity and mortality**

There were no deaths among neonates in the study group, following initial hospital discharge until their neonatal period is over. In this study component reported neonatal morbidity has been defined as hospitalization of the neonate due to any presenting complaint reported by the mother or care giver. Nineteen neonates (19; 4.28%) out of 421, were hospitalized during the neonatal period and most common reason for admission was breathing difficulty followed by yellow coloration of the body Table 2. Out of 19 cases 12 were admitted to Teaching Hospitals and other 7 cases were admitted to Divisional Hospitals and all the cases had only one hospital admission.

**Table 2 : Distribution of Reported Neonatal Morbidity among Term following hospital discharge**

Reason for admission	Frequency	Percentage
Breathing difficulties	6	31.57
Yellow discoloration of the body	4	21.05
Fever	3	15.79
Body Rash	2	10.52
Reduce urine output	1	5.26
Diarrhoea	1	5.26
Weak cry	1	5.26
Continuous cry	1	5.26
Total	19	*

\* Columns do not sum up to 100% because neonates may have had more than one reason for admission.

### **Postnatal home visits by Public Health Midwife (PHM)**

The policy is that the PHM should make the first postnatal visit within 1-5 days of delivery and in this sample only 37.7% had received the first visit in the stipulated period and 78.4% had received the first home visit from the PHM within first 10 days of

delivery. Only 3.08 (n= 13) percent of neonates did not receive any postnatal visit by the Public Health Midwife by the time of the telephone interview (29 to 35 days' post-partum). Majority (84.8%) of the neonates had received an appointment for postnatal clinic visit by the time of the survey (Table 3).

**Table 3 : Distribution of Neonates by the Postnatal Home Visits done by Public Health Midwife.**

First visit (Postnatal Day)	Frequency	Percentage
<b>2-5</b>	154	37.7
<b>6-10</b>	166	40.7
<b>11-21</b>	81	19.9
<b>22 or later</b>	7	1.7
<b>Total number of mothers received postnatal visits</b>	408	100.0

**Key aspects of postnatal care supported by Public Health Midwives at postnatal home visit**

Six key aspects of postnatal care at home (Bathing the baby, cleaning the baby, dressing up baby, keeping baby warm, breastfeeding and to recognize danger signs) supported by the PHMs were assessed based on the responses of the mothers at the telephone interview. Aspects that have been dealt in the postnatal visits successfully by PHMs are detailed in the Table 4. Considerable proportion (n=121; 29.66%) of mothers stated that postnatal visits were not helpful in any of the six aspects questioned in the telephone interview.

**Table 4 : Distribution of Neonates by the Key Aspects of Neonatal Care Supported by the Public Health Midwife at the Postnatal Home Visit**

Aspects of neonatal care	Frequency	Percentage
Bathing the baby	196	48.36
Cleaning the baby	160	39.21
Dressing up baby	49	12.00
Keeping baby warm	45	11.03
Breastfeeding	284	69.61
Recognition of danger signs	252	61.76
None of the above	121	29.66
<b>Total number of mothers received care</b>	408	*

\* Columns do not sum up to 100% because the PHM provide support in more than one neonatal care practice

## **Discussion**

This study was conducted to cover the neonatal outcomes following initial hospital discharge. Face to face interviews after one month of delivery could not be conducted since Teaching Hospital Kandy caters to a large geographical area. One another possible option was to use PHMs as data providers with regard to the neonatal outcomes of term neonates in the field. Since field neonatal care received by the term neonates was considered as an important outcome in the present study, using PHM as data collectors would not be appropriate. Telephone survey or postal survey was the remaining alternatives. A study done on response rates of mail surveys published in medical journals, reported 54 percent to 68 percent response rate in 113 mail surveys <sup>16</sup>. On the other hand response rate for telephone health surveys varies from 45 percent to 70 percent<sup>14,15</sup>. Telephone survey option had been selected for this study due to two reasons; accuracy of data and completeness of survey. Further Sri Lanka is a country with a high mobile usage and it has been in fact shown that the number of mobile phones exceeds the total population of the country meaning that one person has access to more than one mobile phone <sup>17</sup>.

Nearly half (n=197, 46.79%) of the mothers sought medical advice for their neonates following hospital discharge. Out of mothers who have seek medical advises 71.06 (n=140) percent went to ordinary doctors while 28.43 (n=56) percent consulted specialist doctors. All the mothers who mentioned that they had some kind of neonatal health problem seek medical advice from a health professional. This is very important practice to maintain the relatively low neonatal mortality rate in Sri Lanka.

These findings are far better than the findings of the Bashour et al. <sup>10</sup>, where 10 percent of mothers did home management for their baby's health problem and only 71.4 percent went to a doctor seek advice. "Exclusive breastfeeding" is defined as giving no other food or drink – not even water – except breast milk. It does, however, allow the infant to receive oral rehydration salts (ORS), drops and syrups (vitamins, minerals and medicines)<sup>18</sup>. In the present study breast feeding status refers to a past 24 hours' period. All most all women (98.10%) exclusively breast fed their baby. Out of these 6 formula fed babies, one had a hospital admission while 4 out of other 5 babies had sought medical advice either from a specialist doctor or from an ordinary doctor. Exclusive breast feeding rate was higher than the Demographic Health Survey

2006/07<sup>19</sup> report. Where exclusive breast feeding, rate was 92.6 percent and 4.7 percent of formula feeding. This difference could be due to the difference in the gestational age at birth, since premature neonates are generally at a higher risk of initiation formula feeding. Importantly the 5 neonates who had been on formula milk (out of 6) had received medical attention by a qualified medical practitioner. So, it is important to convince all the medical practitioners with regard to importance of exclusive breast feeding over formula feeding.

There were no deaths among studied neonates following initial hospital discharge until their neonatal period is over. Further, in this study “Reported neonatal morbidity” has been defined as hospitalization of the neonate due to any presenting complaint reported by the mother or care giver. Nineteen neonates (4.28%) were hospitalized during the neonatal period and most common reason for admission was breathing difficulty followed by yellow coloration of the body.

Gupta et al.<sup>4</sup>, reported readmission rate of 1.86 percent (n=16) and neonatal jaundice and suspected sepsis as the leading causes of admission among neonates who had been discharged within 48 hours of delivery (97.4% term neonates). In a similar kind of study done by Farh at and Rajab<sup>5</sup> reported 7.9 percent readmission rate and neonatal jaundice as the commonest cause of readmissions.

Only 3.08 percent of neonates did not receive postnatal visit by the Public Health Midwife. Majority received their postnatal visit within 7 days of hospital discharge, while 78.4 percent received that visit within first 10 days of their life. More importantly 84.80 percent received their postnatal clinic visit appointment by the time of survey.

According to annual health report<sup>20</sup>, 92.2 percent received their 1<sup>st</sup> visit by 10 days. Compared to these two indicators the level of postnatal visits was considerably low in the present study.

Six key aspects of postnatal care at home had been assessed based on the responses of the mothers.

Considerable proportion (n=121, 29.66) of mothers stated that postnatal visits were not helpful for the in any of the six aspects questioned in the telephone interview. Postpartum visits had its highest impact of breastfeeding followed by maternal competence on recognizing danger signs. But post-partum visit had its least impact on keeping baby warm and dressing up of baby. Similar finding had been reported by the Bashour et al.<sup>10</sup>. Based on their community trial they had concluded that postpartum visits significantly increased exclusive breastfeeding but not the other outcomes.

### **Conclusions and Recommendation**

Nearly half of the mothers seek medical advice for their neonates following hospital discharge during the neonatal period. All most all women (98.10%) exclusively breast fed their newborn baby. Four percent of the term neonates were hospitalized during the neonatal period and most common reasons for admission was breathing difficulty followed by yellow discoloration of the body. Considerable proportion (, 29.66%) of mothers stated that postnatal visits were not helpful for the in any of the six aspects of postnatal care questioned in the telephone interview. Postpartum visits had its highest impact on breastfeeding followed by maternal competence on recognizing danger signs. But post-partum visit had its least impact on keeping baby warm and dressing up of baby. Skills and competencies of the field staff on provision of domiciliary care for the neonates should be improved. Specially, to provide guidance for the mother in the essential care of the newborn should be improved. More research evidence are needed to understand the most appropriate approaches in the field neonatal care to maximize the impact of postnatal visit by the Public Health Midwives.

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### **Conflict of interest**

The authors declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

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