



SOCIOECONOMIC CAUSES FOR HOSPITAL STAY IN PRETERM INFANTS

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ABSTRACT **INTRODUCTION-** According to WHO every year about 15 million babies are born prematurely. In under resourced regions societal pressures due to family disruption and economic loss due to wages lost during the newborn hospitalization, often worsens poverty. This study is to identify socioeconomic factors which are important in prolonged length of hospital stay. **METHODOLOGY-** Prospective observational study was conducted for a period of 9 months and details of neonates were documented. **RESULT-** 84 preterm newborns were screened. Economic status does not significantly affect the length of stay of preterm infants in hospital. Social factors like maternal education and neonatal age when maternal participation in neonatal care started had an impact on length of hospital stay. **CONCLUSION-** Maternal participation will establish emotional bonding between mother and baby and improve maternal confidence in domiciliary care of baby that leads to decreased length of hospital stay and economic burden on family.

KEYWORDS : preterm infant, socioeconomic causes, hospital stay

INTRODUCTION

According to WHO every year about 15 million babies are born prematurely that is more than one in ten of all babies born globally. Survival rates among even the most premature infants have improved remarkably over the past decades.^{1,3} However, substantial concerns remain regarding the costs of initial hospitalization for these high-risk infants. Provision of neonatal intensive care consumes both financial and medical resources.⁴ Resource use during initial hospitalization among extremely preterm infants is complex, determined by multiple factors, and differs markedly among risk groups.^{5,7} Although there are many costs associated with premature delivery during and after hospital discharge, length of hospital stay is a strong marker for resource utilization in general.⁸ Cost of neonatal care are closely related to length of stay.^{9,12} Hospitalization-associated costs are significantly higher and lengths of stay (LOS) are more than six times greater for extremely preterm infants than for late preterm infant.^{9,10}

This saving could have a major positive impact on the financial security of these families since a large proportion of them come from backgrounds of socio-economic deprivation. In under resourced regions societal pressures due to family disruption and economic loss due to wages lost during the newborn hospitalization, often worsens poverty. Over the last decades there has been a gradual shift toward earlier discharge of preterm infants especially in developing countries. The need arose due to the economic burden being imposed on society for the care of these newborn. In under-resourced regions the additional reason was the high demands and limited availability of NICU beds. The appropriate timing for discharging preterm neonates is a difficult issue for clinicians, especially those in resource limited set-ups. Length of stay is an important issue for quality and cost of healthcare. The ability to accurately predict length of stay in neonatal care is vital for resource planning, commissioning of services, to aid clinician in their counseling of parents and to stimulate quality improvement initiatives.^{13,14} Therefore it is necessary to clarify most important factors affecting their length of hospital stay to lessen unwanted outcome of premature birth and to eliminate or relieve the problem of resources and economic burden.

The hypothesis of this study is to identify, explore and describe factors which are important in prolonged length of hospital stay. In developing countries like India it will also try to understand these factors which could help in optimizing of neonatal care and help health workers and hospital management to develop intervention that may reduce length of hospital stay of newborn.

AIM OF STUDY

To study socioeconomic factors which influence length of hospital stay of premature infants.

MATERIAL AND METHODS

STUDY DESIGN: Observational Prospective Study

STUDY SITE: Batra Hospital and Medical Research Centre, New Delhi

STUDY SUBJECTS: Preterm neonates (Gestation <37 weeks)

STUDY DURATION: From October 2017 to June 2018.

INCLUSION CRITERIA: The inclusion criteria would be Gestational age <37 weeks including inborn and outborn.

EXCLUSION CRITERIA : Neonates having major congenital malformations would be excluded from the study.

OUTCOME : The primary outcome of the study would be length of hospital stay (in days) Length of hospital stay (LOS) - Length of stay (LOS) is the time period between admission of the neonate to the Unit and discharge.

The discharge criteria that the study would use include the following:

1. Infant feeding completely from breast and/or spoon/cup
2. Baby has documented Weight gain of 20-30 gm/day for three consecutive days, and weight is more than 1.5 Kg.
3. Apnea free for 3 days
4. Maintaining normal body temperature on own
5. Baby is hemodynamically stable (normal capillary refill time, normal peripheral pulse)
6. Not on any injectable medication
7. Primary illness has resolved
8. Mother confident to look after her baby at home

Patients were divided in two groups

1. Those discharged in <7 days (Short stay)
2. Those discharged in ≥7 days (Long stay)

DATA COLLECTION:

Neonates, whose parents or caregiver gave written consent, were enrolled into the study. Details of all neonates who were screened but could not be enrolled into the study along with reasons were carefully documented. All data were entered into a structured pretested proforma.

RESULT

84 preterm newborns were screened, of whom 74 were enrolled into the study. Of the 74 enrolled subjects, 65 were successfully discharged. Other 9 did not complete the study as 4 of them died and 4

left study in midway.

Median (Range) gestational age for < 7 days was 35 (30-36) and for > 7 days it was 32.50 (28-36) Median (Range) birth weight for < 7 days was 1.896 (1.530-2.360) Kg and for > 7 days it was 1.551 (1.530-2.360) Kg. It may be concluded that birth weight & gestation have independent correlation with length of stay. Therefore units which handle infants with smaller gestation & smaller weight tend to have longer length of stay of these infants.

More than one third of mothers (44.6%) were educated up to graduate or postgraduate. 80.0% neonates had > 7 days stay in high school educated mothers. In Intermediate education group 21.4% stayed < 7 days and 78.6% stayed > 7 days. The hospital stay of >7 days was 94% significantly lower among educated intermediate/diploma than high school (OR=0.06, 95%CI=0.01-0.72, p=0.02) (Table-1).

More than half of the mothers (52.3%) belonged to upper middle class socioeconomic status. There was no significant (p>0.05) association of hospital stay with socioeconomic status. Economic status does not significantly affect the length of stay of preterm infants in hospital (Table-2).

87.5% newborn baby had > 7 days stay when maternal participation started on more than three days in comparison to only 30.8% newborn baby had > 7 days stay when maternal participation started on day three. Neonates in whom maternal participation started at one day had 97% lower chances and in whom maternal participation started on second day had 96% lower chances of shorter stay than in whom maternal participation was started on more than three days (Table-3). Social factors like maternal education and neonatal age when maternal participation in neonatal care started had an impact on length of hospital stay.

DISCUSSION

This study found that neonates in whom maternal participation was started at one day had 97% lower chances and in whom maternal participation was started at second day had 96% lower chances of shorter stay than in whom maternal participation started on more than three days. This result is supported by a study of Rose et al¹⁵ that Presence of parents beside their infants has also been reported as an effective factor on NICU stay duration reduction.

This study also found that the hospital stay of >7 days was 94% significantly lower among educated intermediate/diploma than high school (OR=0.06, 95%CI=0.01-0.72, p=0.02). This indicates that basic maternal education is needed to understand domiciliary care and be able to follow the guidance of doctor. These mothers were confident to take care of their preterm baby at home so an early discharge could be planned. However it was surprising that baby of mothers who was educated up to honors had length of stay was more than 7 days. There was only three mothers of honors degree, so the effect of their education on the length of stay could not be concluded.

It may be noted that the present study did not detect any significant difference in economic status on prolong hospital stay. Although social factors like maternal education and maternal participation in newborn care played a significant role in length of stay.

CONCLUSION

Length of stay can be shortened by early involvement of mother in care of premature baby. Maternal participation will establish emotional bonding between mother and baby and improve maternal confidence in domiciliary care of baby that leads to decreased length of hospital stay and economic burden on family.

Further research work is required to explore factors other than birth weight and gestation in developing countries so that factors which are more important for prolonged stay can be determined and eliminated.

Table-1: Comparison of duration of hospital stay with maternal education

Maternal education	No. of children		Duration of hospital stay in days				OR (95%CI)	p-value
			>7		<=7			
	No.	%	No.	%	No.	%		
High school	5	7.7	4	80.0	1	20.0	1.00 (Ref.)	
Intermediate/ diploma	28	43.1	6	21.4	22	78.6	0.06 (0.01-0.72)	0.02
Graduate or postgraduate	29	44.6	9	31.0	20	69.0	0.11 (0.01-1.15)	0.06
Profession or honours	3	4.6	3	100.0	0	0.0	-	

SES	No. of children		Duration of hospital stay in days				OR (95%CI)	p-value
			>7		<=7			
	No.	%	No.	%	No.	%		
Lower	1	1.5	0	0.0	1	100.0	-	
Lower middle	20	30.8	4	20.0	16	80.0	0.25 (0.04-1.46)	0.12
Upper lower	2	3.1	1	50.0	1	50.0	1.00 (0.04-22.17)	1.00
Upper middle	34	52.3	13	38.2	21	61.8	0.61 (0.13-2.91)	0.54
Upper	8	12.3	4	50.0	4	50.0	1.00 (Ref.)	

Table-2: Comparison of duration of hospital stay with socioeconomic status

Age when maternal participation in care started in days	No. of children		Duration of hospital stay in days				OR (95%CI)	p-value
			>7		<=7			
	No.	%	No.	%	No.	%		
One	15	23.1	0	0.0	15	100.0	-	-
Two	21	32.3	4	19.0	17	81.0	0.03 (0.01-0.21)	0.0001
Three	13	20.0	4	30.8	9	69.2	0.06 (0.01-0.42)	0.004
More than three	16	24.6	14	87.5	2	12.5	1.00 (Ref.)	

Table-3: Comparison of duration of hospital stay with Age when maternal participation in care started

Age when maternal participation in care started in days	No. of children		Duration of hospital stay in days				OR (95%CI)	p-value
			>7		<=7			
	No.	%	No.	%	No.	%		
One	15	23.1	0	0.0	15	100.0	-	-
Two	21	32.3	4	19.0	17	81.0	0.03 (0.01-0.21)	0.0001
Three	13	20.0	4	30.8	9	69.2	0.06 (0.01-0.42)	0.004
More than three	16	24.6	14	87.5	2	12.5	1.00 (Ref.)	

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