

Analysis of Rehospitalization of Preterm and Term Infants in First Month of Life

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Abstract

Background: rehospitalization of preterm and term neonates was planned readmission to the hospital within 30 days post birth discharge prematurity is the main reasons of neonatal illness and death in concentrated care units universal. The aim of study to study the reasons of rehospitalization of preterm plus term infants in first month of life and analyze the reasons of rehospitalization in relation to infantile and maternal socio-demographic and medical characteristics. **Method:** It is descriptive cross sectional study in hospital on 200 preterm and term infants who were be concerned in the neonatal care units in Babylon Maternity and Pediatrics Hospital, Imam Sadik General Teaching Hospital. **Results:** 200 cases of preterm and term neonates were screened and enrolled in the study. The mean and standard deviation of current maternal age and maternal age at marriage in year were (25.88 ± 7.89) , (20.82 ± 5.56) respectively. 45% of neonates with birth weight less than 2500 Kg, 48.5% of neonates with gestational age of less than 37 weeks, 35% of neonates were admitted due to prematurity at first admission , 53.5% of neonatal rehospitalizations was due to jaundice. The second cause of rehospitalization was infection in 26.5% of neonates, this study found that 3.5% of neonatal readmission were due to surgical follow up , 62% of rehospitalized neonates the cause is medical follow up. **Conclusion:** Jaundice was the major cause of readmission to hospital in both term and preterm neonates. The relation between preterm and early admission (particularly for jaundice and feeding problems) was well documented.

Keywords: *patints; infants; health care; feeding problems*

Introduction

The first 28 days of life accounts for the most vulnerable period in life. This period accounts for 50 – 70 % of infant's mortality and 39% of under 5 deaths ⁽¹⁾. Rehospitalization is defined as a planned readmission to the hospital occurring within 30 days after admission ⁽²⁾. Term infant: - infant born at a gestational age between 37 and 42 completed weeks ⁽³⁾. Preterm infant: is defined as babies born live before 37 weeks of pregnancy are completed. There are sub- categories of preterm birth, based on gestational age

- Extremely preterm (less than 28 weeks)
- Very preterm (28-32 weeks)
- Moderate to late preterm (32 – 37 weeks) ⁽⁴⁾

Babies born preterm are at increased risk of arrange of poor outcomes including respiratory distress

syndromes, necrotizing enter colitis and neonatal sepsis ^(5, 6) in the long term ,they are more likely to experience motor and sensory impairment. Delay in cognitive development and behavioral problems than babies born at term ⁽⁶⁾. Newborn babies in need of critical medical attention are normally admitted to the neonatal intensive care unit (NICU). These infants tend to be preterm, have a low birth weight and or serious medical conditions ⁽⁷⁾. Potentially preventable readmission, such as for jaundice or feeding problems, make up the majority of early neonatal readmissions ⁽⁸⁾. Prematurity still one of the main reasons of neonatal morbidity and mortality international. As the second leading source of neonatal mortality subsequently congenital abnormalities, and a major determinant of neonatal and infant morbidity ⁽⁹⁾, preterm birth occur in 11% of entirely pregnancies international ⁽¹⁰⁾. Preterm are at advanced danger for obtaining problems that consequence from either anatomic or practical immaturity. Prematurity presents a

significant challenge to the global community due to the rapid increase in its incidence and its disproportionate contribution to increased infant mortality rates. The aim of study to study the reasons of rehospitalization of preterm and term infants in first month of life and analyze the reasons of rehospitalization in relation to infantile and maternal socio-demographic and medical characteristics.

Method

This is a cross sectional study which was conducted at Babylon Maternity and Pediatrics Hospital, Imam Sadik General Teaching Hospital from the 15 of March to 15 of August 2020. This study will include a convenient sample of 200 babies who will be cared for in the pediatric wards of the above-mentioned hospitals. Inclusion criteria: All mothers and their newborn infants aged 1 month who were cared for in the above-mentioned hospitals. Exclusion criteria: All admissions outside the above-mentioned hospitals. A pilot study was done before starting collection of data for two weeks in Babylon Maternity and Pediatrics Hospital from first of March 2020 to test the questionnaire for any modification required, any other difficulties, to detect the time needed for data collection. The pilot sample included 40 infants who excluded from the study sample. This pilot study was done to eliminate some variables to reduce time of interview, select appropriate sample size, estimate the time needed, to find potential difficulties and assess whether the research protocol is realistic and workable. The sample size was estimated according to the following equation

$$n = \frac{Z^2 P(1-P)}{d^2} \quad (11)$$

Where:

n = sample size

z = 1.96

p=the proportion

d= Relative precision= 0.05

The total sample required according to the equation is 200 preterm and term neonates. Convenient sample of preterm and term neonates who were admitted to neonatal care units in the above-mentioned hospitals who agreed to participate in this study. At the time of

data collection the participants were asked to give their verbal consent. Each mother was interviewed for about 10 minutes (mothers who refused to participate was excluded and the next mother was interviewed). Data was collected by using a predesigned questionnaire by which the mothers were interviewed. This questionnaire included the following variables

1. Maternal sociodemographic factors which included :- current maternal age , maternal age at marriage , residence , educational level , income , marital status , occupation , consanguinity.
2. Obstetrical history which included:- gravida , spacing between birth (interpregnancy interval), ANC, current medical illness, mode of delivery, contraceptive use prior to pregnancy, number of babies, weight gain during pregnancy, pregnancy complication, planned pregnancy, recurrent preterm birth, family history of preterm birth, history of primary or secondary infertility, history of hospitalization of another child.
3. Neonatal variables that included - birth weight, gestational age, baby gender, birth order. Diagnosis at first admission that included prematurity, respiratory illness, malformation (congenital illness), gastro-enteropathy, infection, metabolic disorder, hemolytic disorder, other (visual, renal).
5. Reason for rehospitalization, which included intensive medical ventilation, surgical and medical follow up.

Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean and SD for continuous data. Chi-square used for assessed association between categorical variables. P-value less or equal to 0.05 is consider significant.

Results

The Distribution of Patients According to Maternal Characteristics. The distribution of patients according to Maternal characteristics including (history of current medical illness, recurrent preterm delivery, family history of preterm delivery, history of infertility, parity, mode of delivery, use of ultrasound, use of contraception prior to pregnancy, weight gain during pregnancy, number of babies, spacing, antenatal care, planned pregnancy, pregnancy complication and history of hospitalization of another child).

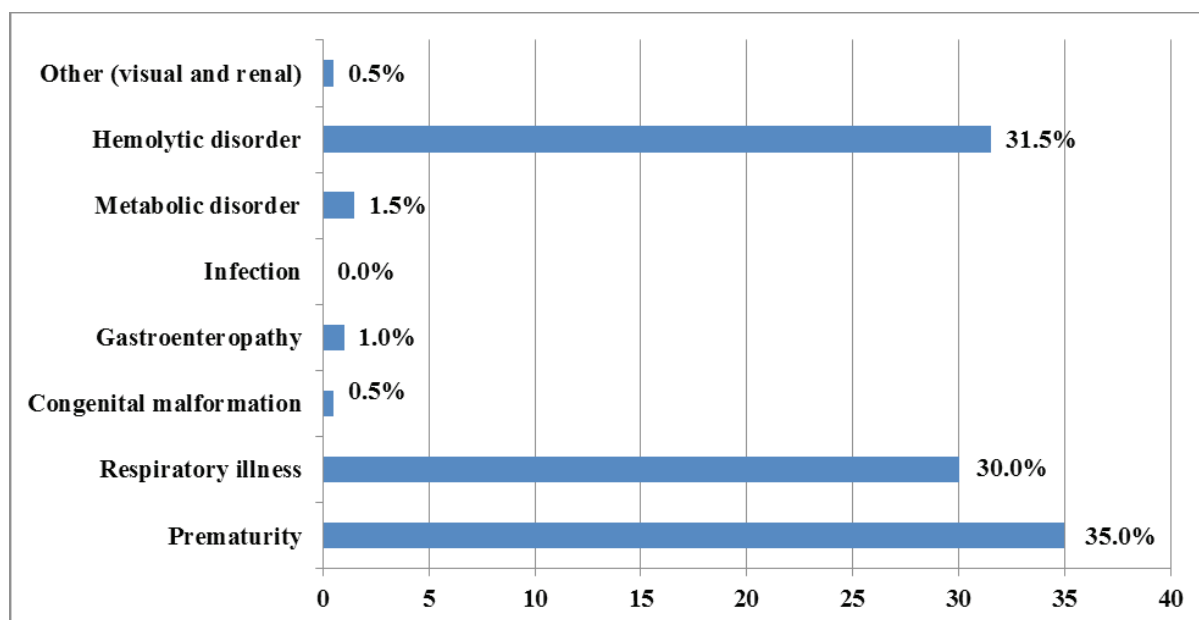


Figure 1: shows distribution of patients according to diagnosis at first admission. Majority (35.0%) of patients diagnosed as prematurity at first admission.

Table 1 shows the association between reason of rehospitalization and maternal characteristics including (age, educational level, and mode of delivery, planned pregnancy, and spacing, and antenatal care, history of infertility, paternal consanguinity and pregnancy complications). There was significant association between reason of rehospitalization and maternal characteristics including (age, educational level, and mode of delivery, paternal consanguinity and antenatal care).

Table 1: Association between reason of rehospitalization and maternal characteristics.

Maternal characteristics	Reason of rehospitalization			P-value
	Intensive medical ventilation	Surgical follow up	Medical follow up	
Maternal age				0.039* f
< 18 years	26 (37.7)	0 (0.0)	29 (23.4)	
18-35 years	31 (44.9)	7 (100.0)	70 (56.5)	
>35 years	12 (17.4)	0 (0.0)	25 (20.2)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Educational level				0.033*f
Illiterate	25 (36.2)	0 (0.0)	24 (19.4)	
Primary	6 (8.7)	1 (14.3)	21 (16.9)	
Secondary	12 (17.4)	0 (0.0)	25 (20.2)	
Higher education	26 (37.7)	6 (85.7)	54 (43.5)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	

Cont... Table 1: Association between reason of rehospitalization and maternal characteristics.

Mode of delivery				
Spontaneous preterm delivery	34 (49.3)	1 (14.3)	46 (37.1)	<0.001*f
Medically induced rupture of membrane	14 (20.3)	2 (28.6)	53 (42.7)	
Elective CS	8 (11.6)	2 (28.6)	19 (15.3)	
Emergency CS	13 (18.8)	2 (28.6)	6 (4.8)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Antenatal care				
Regular	35 (50.7)	7 (100.0)	74 (59.7)	0.039*
Irregular	19 (27.5)	0 (0.0)	38 (30.6)	
Not at all	15 (21.7)	0 (0.0)	12 (9.7)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Paternal consanguinity				
Yes	31 (44.9)	1 (14.3)	35 (28.2)	0.032*f
No	38 (55.1)	6 (85.7)	89 (71.8)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Pregnancy complication				
Yes	9 (13.0)	1 (14.3)	17 (13.7)	1.000 f
No	60 (87.0)	6 (85.7)	107 (86.3)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	

*P value ≤ 0.05 was significant.

Table 2: shows the association between reason of rehospitalization and child characteristics including (gestational age, birth weight, gender, birth order and diagnosis at first admission). There was significant association between reason of rehospitalization and child characteristics including (gestational age, birth weight, and diagnosis at first admission).

Table 2: Association between reason of rehospitalization and child characteristics

Child characteristics	Reason of rehospitalization			P-value
	Intensive medical ventilation	Surgical follow up	Medical follow up	
Gestational age				<0.001* f
28 weeks	1 (1.4)	1 (14.3)	0 (0.0)	
28-<33 weeks	27 (39.1)	0 (0.0)	28 (22.5)	
33-36 weeks	20 (29.0)	1 (14.3)	25 (20.2)	
≥37 weeks	21 (30.4)	5 (71.4)	71 (57.3)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Birth weight				0.006*f
1000-1499 gram	0 (0.0)	0 (0.0)	3 (1.5)	
1500-2499 gram	41 (59.4)	1 (14.3)	45 (36.3)	
≥2500 gram	28 (40.6)	6 (85.7)	76 (61.2)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	

Cont... Table 2: Association between reason of rehospitalization and child characteristics

Gender				
Male	46 (66.7)	6 (85.7)	76 (61.3)	0.379 f
Female	23 (33.3)	1 (14.3)	48 (38.7)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Birth order				
First	31 (44.9)	2 (28.6)	38 (30.6)	0.235 f
Second	23 (33.3)	2 (28.6)	44 (35.5)	
Third or more	15 (21.7)	3 (42.9)	42 (33.9)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	
Diagnosis at first admission				
Prematurity	31 (44.9)	1 (14.3)	38 (30.6)	<0.001* f
Respiratory illness	38 (55.1)	3 (42.9)	19 (15.3)	
Haemolytic disorder	0 (0.0)	0 (0.0)	63 (50.8)	
Other	0 (0.0)	3 (42.9)	4 (3.2)	
Total	69 (100.0)	7 (100.0)	124 (100.0)	

*P value ≤ 0.05 was significant.

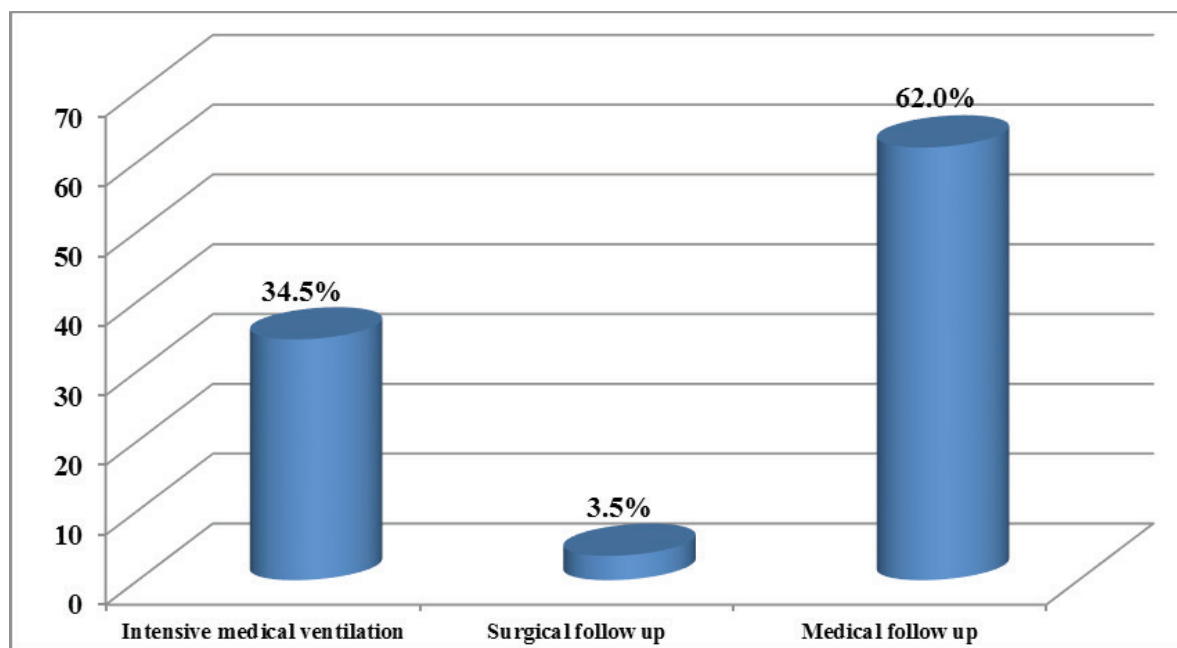


Figure 2: shows distribution of patients according to reasons of rehospitalization. In majority (62.0%) of rehospitalized patients, the cause is medical follow up.

Discussion

Hospital readmission of newborns within one month of post birth discharge is a problem for the infant, the family, and the health care system and must be examined. Readmissions during the neonatal age documented

more than 100 000 hospitalizations respectively year in USA ⁽¹²⁾. Preterm symbolize a populace that is chiefly at danger; in fact, current evidence proposes that in the direct weeks afterward discharge, they are maybe even additional susceptible than infants born at late gestational ages because a mixture of undeveloped physiology plus

lesser strength of hospital and follow up facilities⁽¹³⁾. The choice of 30 days as time for consequence was founded on its recognized use in the works and as an excellence measure in well-being schemes such as the UK Health Facility⁽¹⁴⁾ and in the USA⁽¹⁵⁾. The time is measured suitable, as it is little sufficient to bound the effect of issues external the abrupt control of clinicians, thus possibly making such prehospitalization more agreeable to protective changes in management or discharge choices. In current study shown that 53.5% of Neonatal rehospitalizations was due to jaundice, this is similar to study in North America, that revealed neonatal readmissions are dominated by jaundice⁽¹⁶⁾, and Chinese study where jaundice was found to be the major reason for unplanned rehospitalization with the ratio of 50.94%⁽¹⁷⁾, the condition is caused by enterohepatic circulation issues. In other words, decreased breastmilk intake slows bowel movements and causes slower bilirubin elimination, aggravating jaundice, this is often referred to as breastfeeding failure jaundice, Also, newborn infants were being discharged from the hospital sooner after birth, limiting the ability of physicians to detect jaundice during the period when the serum bilirubin concentration is likely to rise. The second most common cause of rehospitalization was infection in 26.5% of neonates. While in other studies like in UK study, infection accounted for the largest number of rehospitalization. The difference between these studies might be explained by differing midwifery practices in the UK, and availability of neonatal jaundice screening after first discharge also methodologic changes may describe approximately of the differences with results of preceding studies (i.e., period of measurement for readmission, entirely late preterm only against term plus preterm infants⁽¹⁸⁾).

Conclusion

Jaundice was the major cause of readmission to hospital in both term and preterm neonates. The relation between preterm and early admission (particularly for jaundice and feeding problems) was well documented.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

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