

Magnitude of Preterm Admissions in Neonatal Intensive Care Unit of Rural Medical College Hospital

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Abstract

Introduction: Of late, the incidence of preterm births is increasing worldwide, and Asia and Africa are the major contributors of global preterm burden. Preterm babies have increased the risk of morbidity and mortality which is inversely related to both gestational age and birth weight. In spite of the advancements in therapeutics and improvements in the infrastructure and manpower, if preterm births are increasing, goal of reducing infant mortality rate (IMR) will be more difficult.

Objectives: To determine the magnitude of preterm admissions in a special care baby unit of a rural medical college hospital.

Materials and Methods: All preterm admissions admitted from January 2015 to December 2015 were retrospectively studied.

Results: Preterm babies contribute 31.06% of the total admissions, 10.18% of the total admissions were preterm babies <34 weeks of gestational age, and 20.88% of total admissions were preterm babies of gestational age between 34 and 37 weeks.

Conclusions: Preterm babies contribute a significant percentage of the total newborn admissions in a tertiary care center of a rural medical college hospital. Without improving the preterm care reduction of neonatal mortality rate and thereby IMR will be a dream unaccomplished.

Key words: Admissions, Magnitude, Preterm, Rural medical college hospital

INTRODUCTION

Preterm birth has been defined by the World Health Organization (WHO) as any live birth before 37 completed weeks of gestation or fewer than 259 days since the 1st day of a woman's last menstrual period.

Preterm birth occurs for a variety of reasons. Most preterm births happen spontaneously, but some are due to early induction of labor or cesarean birth, whether for medical or non-medical reasons.

Common causes of preterm birth include multiple pregnancies, infections, and chronic conditions such as diabetes and high blood pressure; however, often no cause is identified. There could also be a genetic influence. A better understanding of the causes and mechanisms will advance the development of solutions to prevent preterm birth.

Recent global estimates suggest that more than 1 in 10 or estimated 15 million babies born in 2010 were preterm, of which more than 1 million died as a result of preterm birth and related complications.¹ Although neonatal mortality rates (NMRs) have fallen globally between 1990 and 2009,² the absolute numbers and rates of preterm birth have increased during this period.³ More than 1 million infants die every year because they are born preterm, according to the report. Those who survive have an increased risk of morbidities such as cerebral palsy, blindness, and hearing loss.

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In fact, the global concern about the burden of preterm birth has resulted in November 7th being earmarked as World Prematurity Day.⁴ Increasing preterm birth could significantly militate against the achievement of Millennium Development Goal 4.⁵ Perhaps, in response to this threat, a goal to reduce preterm-specific mortality by 50% by 2025 has been set in the WHO's "born too soon" report.⁶

Approximately one-third of preterm survivors suffers from severe long-term neurological disabilities such as cerebral palsy or mental retardation.⁶ Even late preterm births (34-36 weeks' gestation) have a higher rate of disabilities, jaundice, and delayed brain development. Preterm birth affects not only infants but also their families who may have to spend substantial time and financial resources to ensure care for their preterm infants; thus, preterm birth has increasing cost implications for families and health services.⁷

Improved care of preterm babies has resulted in reduced mortality in developed countries. This is not so in developing countries where the management of preterm birth babies is fraught with difficulties arising from scarcity of resources typified by poorly-equipped specialized newborn care units. Consequently, the burden of the complications and mortality from preterm births remains a significant potential challenge to newborn health in resource-poor settings. Currently, there is scant literature on the epidemiology of preterm births to guide efforts at preventing and/or managing preterm births. The aims of this study were to determine the magnitude of preterm admissions and to ascertain the need for improved facility in the care of the preterm babies.

MATERIALS AND METHODS

Study Center

The study was carried out at a neonatal intensive care unit (NICU) in a rural medical college hospital. It has 11 warmers, 2 continuous positive airway pressure units, 7 ventilators, and 8 infusion pumps. It is manned by 1 Professor, 4 Pediatricians, 1 Junior Residents, 2 Interns, and 18 Staff Nurses.

Sampling

This was a retrospective descriptive study. Using the nominal registers, all preterm admissions for 1-year period from January to December 2015 were obtained. All preterm babies <37 weeks admitted to NICU were included in the study while those born at or after 37 completed weeks were excluded. The gestational ages at birth were calculated using the mother's last menstrual period or early pregnancy ultrasound scan or modified Ballard scoring.

The birth weights were taken as the first recorded weight at birth for the inborns or the weight on admission for those born outside the hospital and presented within the first 24 h of life.

The preterms were classified into 2 main categories according to gestational age at birth as those with gestational age <34 weeks and those with gestational age between 34 and 37 weeks.

RESULTS

During the study period, a total of 2375 babies were admitted. Out of these, 1719 babies were inborn babies and remaining 656 babies were delivered in the nearby Primary Health Centers, Government Hospitals or private hospitals or at home and had been referred or brought to our hospital for NICU care (Table 1). Out of 2375 babies, 735 babies were preterm babies contributing 30.95% of the total admissions (Table 2). The highest percentage of preterm admissions was noted during January and lowest during June. Among the 735 preterm babies admitted, 534 babies were inborn babies and 201 babies were outborn babies. This makes 72.65% of preterm admissions from Inborn and 27.35% of preterm admissions from outborn ward (Table 3). Most of the preterm admissions were inborn. With this data, we infer that most of the anticipated preterm deliveries were recognized, and the babies were transported in utero. Both the spontaneous preterm labor and also the non-spontaneous preterm labor where there might be maternal complications were referred to higher centers where facilities for expert maternal care and expert preterm care are available round the clock. Out of the total 735 preterm babies admitted, 225 babies were of gestational age <34 weeks contributing to 9.47% of the total newborn admissions (Table 4) and 30.61% of total preterm admissions (Table 5). The number of late preterm babies with gestational age between 34 and 37 weeks was 510 which made 21.47% of the total newborn admissions in NICU for the year 2015 (Table 6) and 69.39% of the total preterm admissions in NICU for the year 2015 (Table 5). Major proportion of the preterm babies admitted was of late preterm babies as per the results.

DISCUSSION

The preterm admission rate in this NICU is 30.95%. A previous Indian study from Assam published before 17 years in the year 1998 had estimated a preterm admissions rate of 21.2%.⁸ A South African study, which was published in the year 1999, reported a much higher rate of 54% as preterm admission rate.⁹

Table 1: Total and month-wise admissions in NICU*

Month	Inborn admissions	Outborn admissions	Total admissions
January	148	38	186
February	113	48	161
March	197	70	267
April	165	60	225
May	149	55	204
June	154	53	207
July	139	58	197
August	123	55	178
September	139	58	197
October	139	54	193
November	134	58	192
December	119	49	168
Total	1719 (72.38)	656 (27.62)	2375

*Percentage in parentheses, NICU: Neonatal intensive care unit

Table 2: Total and month-wise preterm admissions in NICU

Month	No of preterm admissions	Percentage of preterm admissions
January	82	44.09
February	77	47.83
March	104	38.95
April	76	33.78
May	56	27.45
June	38	18.36
July	57	28.93
August	50	28.09
September	46	23.35
October	47	24.35
November	56	29.17
December	46	27.38
Total	735	30.95

NICU: Neonatal intensive care unit

Table 3: Month-wise preterm admissions in inborn and outborn wards of NICU*

Month	Inborn preterm admissions	Outborn preterm admissions	Total preterm admissions
January	72	10	82
February	54	23	77
March	75	29	104
April	29	47	76
May	40	16	56
June	27	11	38
July	46	11	57
August	39	11	50
September	35	11	46
October	40	7	47
November	43	13	56
December	34	12	46
Total	534 (72.65)	201 (27.35)	735

*Percentage in parentheses, NICU: Neonatal intensive care unit

The estimated prevalence of preterm admissions in a tertiary health center in South Nigeria is 24%.¹⁰ In this study conducted by Kunle-Olowu *et al.*, out of the 634 babies admitted to the Special Care Baby Unit during

Table 4: Month-wise admissions of preterm babies of gestational age <34 weeks

Month	No of preterm babies of gestational age <34 weeks admitted in NICU	Percentage of preterm babies of gestational age <34 weeks admitted in NICU
January	11	5.91
February	8	4.97
March	19	7.12
April	10	4.44
May	20	9.8
June	17	8.21
July	21	10.66
August	29	16.29
September	22	11.17
October	24	12.44
November	24	12.5
December	20	11.9
Total	225	9.47

NICU: Neonatal intensive care unit

Table 5: Analysis of preterm admissions based on gestational age*

Total preterm admissions in the year 2015	Preterm of gestational age <34 weeks admitted in the year 2015	Preterm of gestational age 34-37 weeks admitted in the year 2015
735	225 (30.61)	510 (69.39)

*Percentage in parentheses

Table 6: Month-wise admissions of preterm babies of gestational age 34-37 weeks

Month	No of preterm babies of gestational age 34-37 weeks admitted in NICU	Percentage of preterm babies of gestational age 34-37 weeks admitted in NICU
January	71	38.17
February	69	42.86
March	85	31.84
April	66	29.33
May	36	17.65
June	21	10.14
July	36	18.27
August	21	11.8
September	24	12.18
October	23	11.92
November	32	16.67
December	26	15.48
Total	510	21.47

NICU: Neonatal intensive care unit

the study period of 3 years from January 2010 to October 2012, 152 (24%) were preterm. The unit has 6 cots and 3 incubators and is manned by 2 Pediatricians, Residents, and Nursing staff with an average ratio of one nurse to 6 patients.

Ugochukwu *et al.* from a special care baby unit of Nnewi reported a preterm admission rate of 18% over a total

Table 7: Comparison of our study with other 2 studies from tertiary care centers

Parameters	Our study	Kunle-Olowu <i>et al.</i>	Ugochukwu <i>et al.</i>
Study period	12 months	3 years	29 months
Total admissions	2375	634	699
Total preterm admissions	735	152	133
Percentage of preterm admissions	30.95	24	19

period of 29 months from May 1998 to October 2000.¹¹ This unit consists of three wards designated for inborn babies, outborn babies, and isolation. There are 17 cots, 1 infant warmer, 5 incubators, 2 oxygen cylinders, 5 phototherapy units, 1 apnea monitor, and 4 resuscitation kits.

Our study has reported a higher case load and higher preterm admission rate than the tertiary health center in South Nigeria (Table 7).

CONCLUSIONS

Preterm babies contribute a significant percentage of the total newborn admissions in a tertiary care center of a rural medical college hospital. Without improving the preterm care reduction of NMR and thereby infant mortality rate will be a dream unaccomplished. Augmentation of the existing infrastructure, therapeutic facilities, manpower

and periodic training and review of the staff nurses is the need of the hour.

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