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Original Article

Prevalence of Preterm Admissions and the Risk Factors of Preterm Labor in Rural Medical College Hospital

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Abstract

Background: Preterm deliveries are important contributors for neonatal intensive care unit (NICU) admission. Preterm birth is a major problem associated with neonatal mortality and morbidity in developing countries. Early admission of mother and prolonged hospitalization of babies impart psychological and financial burden for the family.

Aim: To study on the prevalence of preterm admissions and etiology of preterm labor in newborn care unit of rural medical college hospital.

Materials and Methods: This retrospective study was conducted at rural tertiary care center NICU for 1 year. Maternal risk factors leading to preterm labor were also analyzed.

Results: During the study period 2156 total cases were admitted in newborn are unit. Among the total 2156 admissions 609 (28.25%) were preterm babies. 260 (12.06%) of total newborn admission were <34 weeks. 349 (16.19%) of total newborn admission were 34-37 weeks. The etiology of preterm birth is multifactorial. Prevalent causes of prematurity were anemia 173 (28.41%), preterm premature rupture of membrane 150 (24.63%) and pregnancy induced hypertension 111 (18.23%). Other prevalent causes were oligohydromnios, multiple pregnancies, antepartum hemorrhage, polyhydromnios, fetal distress, gestational diabetes mellitus, and cervical incompetence.

Conclusion: Prematurity is the main cause for admissions in newborn care unit. Modifiable risk factors have to be considered and counseling should be started from adolescent period. High-risk pregnancy and preterm babies have to be referred timely, and timely interventions have to be done.

Key words: Anemia, Etiology, Pregnancy induced hypertension, Preterm, Preterm premature rupture of membrane, Risk factors

INTRODUCTION

The World Health Organization defines preterm birth as birth before 37 completed weeks. Each year 15 million babies are born preterm worldwide.[1] South Asia and sub-Saharan Africa account for almost two-thirds of the world's preterm babies. India is the biggest contributor to the world's prematurity burden. According to the WHO fact sheet 2013, India has 35, 19,100 preterm birth. It is around 23.6% of the total 15 million world preterm birth.

Antenatal steroids, thermoregulation, good respiratory support (in the form of nasal oxygen, continuous positive airway pressure, and ventilator care), hygienic practices, feeding support, intravenous fluid, inotrope support antibiotics, parenteral nutrition, kangaroo mother care, and surfactant are claimed for the important improvements in today's neonatal care, diagnostic modalities such as portable X-ray, neurosonogram, echocardiography, and ultrasonography also plays a key role in early diagnosis and treatment of preterm complication.

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In spite of intensive neonatal care, immaturity at birth has lifelong impact on various systems. The babies may have feeding difficulty, temperature instability, hypoglycemia, infection, respiratory distress syndrome, bronchopulmonary dysplasia, apnea of prematurity, jaundice, necrotizing enterocolitis, gastroesophageal reflux, patent ductus arteriosus, retinopathy of prematurity, germinal matrix hemorrhage, intraventricular hemorrhage, periventricular leukomalacia, and anemia of prematurity. Moreover, the adverse long-term outcomes were motor disability, cognitive difficulties, attention deficit hyperactivity disorder, and long-term respiratory consequences such as asthma and bronchitis.[2]

In India, there is a high incidence of preterm labor. The etiology of preterm labor is multifactorial. The major cause is preterm premature rupture of membranes (PPROM). Other causes of preterm labor are uteroplacental insufficiency, intra uterine vascular lesions, uterine over distension (due to multiple gestation and polyhydromnias), and cervical incompetence.[3,4]

This study is done to find out the incidence of preterm birth, causative risk factors for preterm labor and to study preterm complication such as respiratory distress syndrome, intraventricular hemorrhage, and retinopathy of prematurity in our institute.

MATERIALS AND METHODS

This study was conducted at rural tertiary care center neonatal intensive care unit (NICU). This was a retrospective study conducted for 1 year from September 2015 to august 2016. The study population included newborn babies admitted in NICU admitted with gestational age <37 weeks. The study excludes babies with gestational age more than 37 weeks. The data were collected from admitted preterm babies' medical records and nominal registers from our NICU. Details such as gestational age, weight, and duration of hospital stay were reviewed. Maternal risk factors leading to preterm labor such as preterm premature rupture of membrane (PPROM), pregnancy-induced hypertension (PIH), antepartal hemorrhage (APH), fetal distress, multiple pregnancy, polyhydromnias, oligohydromnias, gestational diabetic mellitus, and cervical incompetence were analyzed. The prevalence of anemia among women with preterm labor was studied.

RESULTS

During the study period, 2156 total cases were admitted in NICU. Out of the total 2156 cases, 1536 were inborn (71.24%) and 620 (28.76%) were out born. Among the total 2156 admissions 609 (28.25%) were preterm babies. Among the 609 total preterm admissions 461 (75.70%) were inborn and 148 (24.30%) were out born preterm (Table 1).

Out of the total 609 preterm admissions, 260 were <34 weeks. This contributes 12.06% of total newborn admission. 349 were late preterm (gestational age 34-37 weeks). This contributes 16.19 % of total newborn admission (Table 2).

The etiology of preterm birth is multifactorial. Prevalent causes of prematurity were anemia 173 (28.41%), PPROM 150 (24.63%) and PIH 111 (18.23%). Other prevalent causes were oligohydromnios 80 (13.14%), multiple pregnancy 57 (9.36%), APH 28 (4.60%), polyhydromnios 12 (1.97%), fetal distress 11 (1.81%), gestational diabetes mellitus (GDM) 9 (1.48%), and cervical incompetence 6(1%) (Table 3).

Table 1: Admission patterns in NICU month wise

Month from September 2015 To August 2016	Total admission	Inborn admission	Outborn admission	Total preterm admission	Inborn preterm admission	Outborn preterm admission	Percentage of preterm admission among total admission
September	197	139	58	46	35	11	23.35
October	193	139	54	47	40	7	24.35
November	192	134	58	56	43	13	29.17
December	168	119	49	46	34	12	27.38
January	141	108	33	46	34	12	32.62
February	195	140	55	72	58	14	36.92
March	179	135	44	58	44	14	32.40
April	184	124	60	58	40	18	31.52
May	179	120	59	40	29	11	22.35
June	178	130	48	50	39	11	22.09
July	169	121	48	49	36	13	28.99
August	181	127	54	41	29	12	22.65
Total	2156	1536	620	609	461	148	28.25

NICU: Neonatal intensive care unit

Table 2: Admission of preterm according to gestational age

Month from september 2015 To August 2016	No and percentage of preterm admitted with gestational age<34 weeks	No and percentage of preterm admitted with gestational age 34-37 weeks	Total preterm admission and percentage of preterm admission among total admission
September	22 (11.17)	24 (12.18)	46 (23.35)
October	24 (12.43)	23 (11.92)	47 (24.35)
November	24 (12.50)	32 (16.67)	56 (29.17)
December	20 (11.90)	26 (15.48)	46 (27.38)
January	19 (13.47)	27 (19.15)	46 (32.62)
February	36 (18.46)	36 (18.46)	72 (36.92)
March	23 (12.85)	35 (19.55)	58 (32.40)
April	19 (10.33)	39 (21.19)	58 (31.52)
May	15 (8.38)	25 (13.97)	40 (22.35)
June	19 (8.39)	31 (13.70)	50 (22.09)
July	16 (9.47)	33 (19.52)	49 (28.99)
August	23 (12.71)	18 (9.94)	41 (22.65)
Total	260 (12.06)	349 (16.19)	609 (28.25)

Table 3: Various etiology of preterm labor

Month from September 2015 to August 2016	Anemia	PPROM	PIH	Oligo hydromnios	Multiple pregnany	APH	Poly hydromnios	Fetal distress	GDM	Cervical incompetence
September	12	9	8	5	9	1	0	1	1	0
October	11	10	12	6	2	5	1	0	0	0
November	15	15	10	9	9	1	0	2	0	0
December	13	11	8	9	4	3	0	1	1	0
January	11	12	6	6	3	3	4	2	1	2
February	20	19	10	5	6	2	2	1	3	1
March	11	12	12	10	4	1	0	0	1	1
April	12	10	9	5	2	2	0	1	0	0
May	15	10	6	7	2	3	1	2	1	0
June	22	15	15	5	6	2	0	1	0	0
July	17	14	8	8	8	2	3	0	1	0
August	14	13	7	5	2	3	1	0	0	2
Total	173	150	111	80	57	28	12	11	9	6
Percentage	28.41	24.63	18.23	13.14	9.36	4.60	1.97	1.81	1.48	1.00

PIH: Pregnancy induced hypertension, PPROM: Preterm premature rupture of membranes, APH: Antepartal hemorrhage, GDM: Gestational diabetes mellitus

DISCUSSION

In this study, preterm admissions constituted 609 (28.25%) among the total 2156 admissions for 1-year period. Our preterm admission rate is more than the 23.8% (86 preterm admission among total 361 admission) reported by Shah *et al.*,[5] who conducted study at a tertiary care center in eastern Nepal from January 2012 to December 2012. Moreover, this is more than the 24% (152 preterm admission among 634 total admissions) reported by Kunle-Olowu *et al.*,[6] of Nigeria. In his study, the study period was three years (January 2010 to December 2012).

In our study, the most common risk factors for prematurity was anemia 173 (28.41%), PPROM 150 (24.63%), and PIH 111 (18.23%). In a retrospective study for 1 year 2012-2013 done by Chowdarareddy *et al.*,[7] of Bangalore, out of 58 preterm babies the main risk factors for preterm delivery were anemia 30 (51.7%) and PIH 15 (25.86%).

In our study, incidence of preterm premature rupture of membrane was 150 (24.63%). This is similar to findings by Uma *et al.*,[8] of Lucknow (2007) who reported that preterm premature rupture of membrane was associated with 25.9% preterm birth. Von der Pool[9] also reported that 30% of preterm births are associated with rupture of membrane.

PIH is the third main cause for the prematurity. This is similar to studies from other authors in Nigeria,[10] Nepal[11] and Thailand.[12]

Other prevalent causes were oligohydromnios 80 (13.14%), multiple pregnancy 57 (9.36%), APH 28 (4.60%), polyhydromnios 12 (1.97%), fetal distress 11 (1.81%), GDM 9 (1.48%), and cervical incompetence 6(1%).

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