

Sociodemographic and Perinatal Factors Affecting Pneumonia: A Cross Sectional Study

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Abstract

Objective: Objective was to evaluate the sociodemographic and perinatal factors determining severity of acute lower respiratory tract infection (ALRTI) among children below five years. *Materials and Methods:* Cross sectional study conducted at HSK hospital & Research centre, Bagalkot, from March-2014 to August-2015. 200 ALRI cases aged 2 months to 5 years as per WHO criteria for pneumonia were evaluated for sociodemographic and perinatal factors determining severity of pneumonia. *Results:* In our study out of 200 cases admitted with ALRTI 3 had Pneumonia, 155 had Severe Pneumonia and 42 had Very Severe Pneumonia according to WHO ARI programme. There were 116(58%) male in the study. More than half were infants 107(53.5%), 57(28.5%) were of birth order 3 or more and 88(44%) were living in overcrowded houses. 36(18%) were home delivery, 32(16%) were preterms and 43(21.5%) had low birth weight (LBW). In our study 41(20.5%) cases received pre lacteal feeds, 138(69%) cases were exclusively breast fed and 53 (26.5%) were incompletely immunized. Statistical significance was found between EBF, gestation at delivery and pneumonia severity. *Conclusion:* Certain factors like young age, male sex, overcrowding, high birth order, low SES, prematurity, lack of EBF, Incomplete immunization, are associated with increased incidence of pneumonia. Measures like improving the living conditions and educating about need for family planning, birth spacing and adequate antenatal care to prevent preterm, LBW, overcrowding and malnutrition can decrease the ALRTI incidence. Promotion of EBF, immunization coverage and adequate perinatal care can reduce the disease burden.

Keywords: WHO; ALRTI; Pneumonia; EBF.

Introduction

Acute Lower Respiratory tract infection (ALRTI) is the leading cause of under-5 childhood morbidity in the world, with nearly 156 million new episodes each year, of which India accounts for a bulk of 43 million [1]. Of the 7.6 million children who died in the first five years of life in 2010, Pneumonia caused 1.4 million deaths (18.3%) and 4% of that are in the neonatal period. In India an estimated 4 lakh pneumonia deaths occurs annually, which is highest among all the countries in the world [2]. The incidence of pneumonia is more than 10 fold higher and number

of childhood related death due to pneumonia around 2000 fold higher in developing than in developed country [3]. This difference is due to high prevalence of malnutrition, low birth weight and indoor pollution in developing countries [4].

Respiratory-tract infections are caused by a mixture of viral and bacterial pathogens and are particularly common in low birth weight children and children exposed to poor nutritional conditions, indoor air pollution, low socioeconomic status, overcrowded living condition, HIV co-infection, vitamin D deficiency, and low immunization coverage [5].

Pneumonia not only has an immediate effect

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during childhood, but can also lead to impaired lung function years later in adulthood.⁶Respiratory tract infections increases demands for medical interventions in terms of both outpatient services and hospital admissions causing significant financial burden on the economy of the country. Also cause missed school days, and caring for a sick child may lead to absenteeism from work.

The utility of simple clinical signs like rapid breathing and chest in drawing to diagnose pneumonia in infants and young children has been well established. The use of these clinical signs in the early detection and treatment of children with pneumonia by primary health care workers forms the basis for the case management strategy formulated by the WHO to control mortality and morbidity [7]. It is important to know risk factors that can be used to identify a child who have a higher risk of dying from ALRTI so that these children can be given more intensive therapy [8].

Since ALRTI is the commonest cause of morbidity and mortality in under five children, the aim is to study these children's sociodemographic and perinatal factors determining severity of ALRTI.

Objectives

To evaluate the sociodemographic and perinatal

factors determining severity of ALRTI.

Material and Method

We conducted a Cross Sectional study of ALRTI in children aged 2 months to 5 years as per WHO guidelines [7] over a period of 18 months from March 2014 to August 2015 admitted in tertiary care teaching hospital.

Children with Congenital Heart Diseases, Tuberculosis, Bronchial asthma, Hospital acquired illness and those who were admitted outside for the same illness were excluded from the study as it could alter the severity and outcome of cases.

The data collected was tabulated in Microsoft Excel and analyzed with SPSS software, Chi Square test for proportion and other appropriate statistical tests like percentage and proportions were applied.

Results

In our study out of 200 cases admitted with ALRTI 3 had Pneumonia, 155 had Severe Pneumonia and 42 had Very Severe Pneumonia according to WHO ARI programme.

Table 1: Comparing Socio demographic factors with Pneumonia severity

Variability		Pneumonia	Severe	Very severe	Total	'p' value
Age in months	2-12	0	86	21	107	0.142
	13-60	3	69	21	93	
Sex	Male	3	88	25	116	0.315
	Female	0	67	17	84	
Birth order	1	2	49	6	57	0.21
	2	1	62	23	86	
	3	0	25	9	34	
	≥3	0	14	4	23	
SES	I	0	4	0	4	0.381
	II	2	30	11	43	
	III	1	57	12	69	
	IV	0	60	16	77	
	V	0	4	3	7	
Overcrowding	Yes	1	68	19	88	0.92
	No	2	87	23	112	
Total		3	155	42	200	

'p' <0.05 was considered as statistically significant.

In the present study there were 116 (58%) male and 84 (42%) female cases out of which 107 (53.5%) were infants and remaining 93 (46.5%) were between the age group of 1-5 years. 153 (76.5%) were of lower social status (class III-V) and 47 (23.5%) were

belonging to upper status (class I and II). 57 (28.5%) are of birth order 3 or more than 3 and 88 (44%) were living in overcrowded condition

No statistical significance was found with WHO severity classification of Pneumonia and the studied

socio demographic risk factors. Majority of the cases were of birth order 2(86) belonging to class III (69) and class IV (77) living in overcrowding condition (44%).

Table 2: Comparing Perinatal risk factors with Pneumonia severity

Variability		Pneumonia	Severe	Very Severe	Total	'p' value
Place of Delivery	Hospital	2	128	34	164	0.762
	Home	1	27	8	36	
Gestation	Term	2	125	41	168	0.021
	Preterm	1	30	1	32	
Birth weight	≥2.5	2	91	34	127	0.065
	≤2.5	0	37	6	43	
	Not known	1	27	2	30	
Immunization	complete	2	116	29	147	0.725
	Incomplete	1	39	39	53	
Prelacteal feeds	Yes	0	33	8	41	0.642
	No	3	122	34	159	
EBF	Yes	2	114	22	138	0.031
	No	1	41	20	62	
Total		3	155	42	200	

In our study out of 200 cases 36 (18%) were delivered at home, 32 (16%) were preterm births and 41 (20.5%) cases received pre lacteal feeds. 53 (26.5%) were with missed immunization at birth or with incomplete immunization for age.127 (63.5%) were of normal birth weight, 43 (21.5%) were low birth weight and birth weight was not known in 30 (15%) cases. In our present *study statistical significance was found between pneumonia severity and gestation at delivery, Exclusive breast feeding.*

Discussion

In the present study, 200 ALRI cases were studied for the risk factors affecting pneumonia severity. ALRI among infants was 53.5% which in accordance with previous studies by Savitha et al [9], Broor et al [10] and Sehgal et al [11] where infants with ALRI accounted about 52-62%. Young age (infants <12 months) was found to be risk factor for poor prognosis [12]. This could be due to waning of maternally conferred passive immunity towards the latter half of infancy with other contributing factors like narrow airways.

We observed that male (58%) outweighed females (42%) which were in comparison with studies done by Savitha et al [9] (64.4%), Broor et al [10] (73.1%). This probably can be explained by the importance of cultural factors, such as preference in seeking medical care for boys.

76.5% cases belonged to lower socioeconomic status and overcrowding was seen in 44% cases.

28.5% were of birth order ≥3. All these can predispose the children to acquire ALRTI due to increased prevalence of malnutrition, poor ventilation and spread of viral infections. Savitha et al [9] found parental illiteracy, low socioeconomic status, overcrowding and partial immunization were significant socio demographic risk factors for ALRI. They also found that administration of prelacteal feeds, early weaning, anaemia and malnutrition as significant risk factors.

In our study, 18% cases were home delivery, 16% were preterm births and 21.5% had low birth weight. 20.5% cases received pre lacteal feeds and 26.5% were with partial/incomplete immunization. Only gestation was significantly associated with pneumonia severity. This could be explained by higher incidence of malnutrition, anaemia among preterms.

Tupasi et al [13] in their study found that the risk factors that increase the incidence and severity of lower respiratory infection in developing countries include large family size, higher birth order, overcrowding, low birth weight, malnutrition, lack of breastfeeding, pollution and young age. Zafar F et al [14] observed that delivery at home and respiratory infection in the early neonatal period were found to be associated with increased likelihood of pneumonia compared to birth in hospitals. Jackson et al [15] in their review found consistent significant association between 7 risk factors (low-birth-weight, undernutrition, indoor air pollution, incomplete immunization at one year, HIV, breastfeeding, and crowding) and severe ALRI.

Conclusion

Acute Lower Respiratory Tract infection remains one of the major causes of morbidity and mortality in children and frequent cause of health care seeking both on outpatient and inpatient basis. Infants and male children are affected frequently.

Among the studied risk factors period of exclusive breast feeding and gestational age at birth were significantly associated with pneumonia severity and majority belonged to lower socio economic group living in overcrowding condition. Young age, preterms, Low-birth weight babies, malnutrition, overcrowding, Indoor pollution and poor socioeconomic status continues to be an important predisposing factor for childhood respiratory illness.

Measures like improving the living conditions and educating about need for family planning, birth spacing and adequate antenatal care to prevent preterm, low-birth weight, overcrowding and malnutrition can decrease the ALRTI incidence. Effective utilization of under-five clinics to ensure availability of proper nutrition to combat malnutrition and anaemia, and increasing the immunization coverage and promoting exclusive breast feeding can reduce the disease burden. Training of local health personnel in early recognition, treatment and referral of sick and at-risk children helps to improve the morbidity and mortality profile.

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