

Childhood Pneumonia: a Community Based Interventional Study in Slums of Dibrugarh, Assam

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Abstract :

Introduction: Pneumonia, leading cause of child morbidity and mortality globally, which is concerning as proven interventions exist. **Objective:** to assess effect of community based interventions on occurrence of pneumonia in slums of Dibrugarh town. **Methods:** Community based before- after intervention study using mixed method between 2015-2017; where quantitative part by using predesigned format filled by house to house visit done in baseline and endline and qualitative by focus group discussion conducted during end line study. Social and behavior change communication package was given as intervention. **Results:** A total of 420 in baseline and 300 participants enrolled in end line study. Pneumonia prevalence reduced from 16.9% to 9.3% following intervention. Exclusive breast feeding and complimentary feeding initiation at 6 month significantly increased from 42.9% to 60% and 9.8% to 77.7% respectively. Type of family, socio economic status, mother's education, complementary feeding practices, immunization and indoor air pollution were significantly associated with pneumonia. **Conclusion:** Implementation of community based social and behavior change communication package was effective.

Keywords: Childhood pneumonia, community based interventions, Assam, Dibrugarh

Introduction:

Global incidence of pneumonia in childhood population is 0.28% episodes per child per year with inter quartile range of 0.21-0.71 episodes per child per year of which 95% of cases occur in developing nations¹. In India, there are 43 million pneumonia cases among children which accounts to 23% of world's total pneumonia cases with 0.37 episodes of clinical pneumonia per child per year as estimated by Child Health Epidemiology Reference Group (CHERG) established by WHO in 2008². In 2010, of the 1.682 million deaths among under five children in India, pneumonia accounted for 0.397 million deaths which tops among the listed causes of death³. Because of poor coverage of interventions, the burden of pneumonia is still high. With the acceleration in implementation of key interventions, there will be substantial dropping in number of child deaths from pneumonia each year.⁴

The children residing at urban slums are much susceptible to infectious diseases like pneumonia because of crowding and substandard housing facilities⁵. So the present study was carried out in urban slums with the objective to assess the effect of community based interventions on the occurrence of pneumonia in slums of Dibrugarh town.

Methods:

Two slums Graham Bazar and Chandmari Ghat were chosen from amongst the ten registered slums in Dibrugarh and intervention was done which was planned based on results of baseline qualitative and quantitative study. Institutional ethical clearance was obtained and written informed consent was taken from each participants. A community based cross sectional baseline study was undertaken in both slums. Taking annual cumulative incidence of pneumonia for 12-23 month as 38.3 per thousand with an expected 10% reduction in

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prevalence following intervention and considering 80% power and 5% relative precision, the required sample size is 357 for two tail distribution, considering 15% non response rate and rounding up the sample size is inflated to 420.^(6,7) The participants selected per slum were based on probability proportionate to size technique.

Focus Group Discussion was conducted to know community practice in case of childhood pneumonia, their health care seeking behavior and factors influencing it. Two FGDs for each group i.e, mothers of under-five child, mother – in – law and frontline workers from the community like Anganwadi worker and link workers (represent ASHA in urban slums) and ANM serving the population and also other influencing community leaders, club members, local representatives of municipality etc. for each slum was done. Based on findings of this qualitative research the social and behavioural change communication (SBCC) strategies were planned and implemented. SBCC intervention strategy includes one to one interaction with mothers, caregivers on living a healthy lifestyle, practice of hygiene during cooking, handling of food, cleaning the children, enhancing the knowledge level through video shows on health awareness, prevention of childhood diseases were discussed.

All frontline workers of the selected slum where intervention was done were trained for assessment of pneumonia based on home based new borne care module and IMNCl guidelines using the criteria of fast breathing and chest in drawing. Interventions also included health education and promotional activities to prevent the identified risk factors. The health workers assessed children for signs and symptoms of pneumonia and they were supervised by supervisors who were trained facilitators of IMNCl training. Practices of certain behaviours in relation to myths existing in the community were discussed. Efforts were also taken to enhance health care seeking behavior for childhood diseases. Endline study was done using the same formats after 1 year of intervention. Children suffering from pneumonia were referred to nearby 24x7 State dispensary and also to the tertiary centre situated within 2km radius. Statistical analysis was done by using SPSS .20 and rates, ratios, proportions and univariate analysis.

Results:

The response rate was 100% (420) in baseline, while 72% (300) in end line study. During the baseline study, prevalence of pneumonia was 16.9% and after intervention, it was reduced to 9.3%. (Table 1).

Table 1. Distribution of the study population according to signs and symptoms of pneumonia during baseline (without intervention) and end line study following intervention.

Variables	Signs and symptoms of pneumonia		Total participants
	Yes	No	
Baseline study	71 (16.9%)	349 (83.1)	420
Endline study	28 (9.3%)	272 (90.7%)	300

Table 2: Univariate analysis to show factors associated during baseline and endline survey in intervention areas.

Variables		Intervention		P value
		Baseline (n=420)	Endline (n=300)	
Prelacteal Feed	Given	226 (53.8)	119 (39.7)	0.000
	Not given	194 (46.2)	181 (60.3)	0.000
Feeding in first six months	Only breast milk	180 (42.8)	186 (62.0)	0.000
	Breast milk + water	41 (9.8)	22 (7.3)	0.254
	Others	199 (47.4)	92 (30.7)	0.000
Complementary feeding	Less than 6 months	180 (42.8)	19 (6.3)	0.000
	At 6 months	41 (9.8)	233 (77.7)	0.000
	More than 6 months	199 (47.4)	48 (16.0)	0.000
Immunization	Complete	281 (66.9)	185 (61.7)	0.147
	Partial	136 (32.4)	114 (38.0)	0.118
	Not immunized	3 (0.7)	1 (0.3)	0.496
Indoor air pollution	Yes	246 (58.6)	168 (56.0)	0.490
	No	174 (41.4)	132 (44.0)	0.490

P<.001

Table 3: Univariate analysis to show factors associated with signs and symptoms of pneumonia in intervention areas during baseline and end line survey.

Variables		Baseline study		P value	End line study		P value
		Signs and symptoms of pneumonia			Signs and symptoms of pneumonia		
		Yes (%)	No (%)		Yes (%)	No (%)	
Gender	Male	39 (19.3)	163 (80.7)	0.241	16 (11.4)	124 (88.6)	0.320
	Female	32 (14.7)	186 (85.3)		12 (7.5)	148 (92.5)	
Religion	Hindu	55 (18.3)	246 (81.7)	0.252	22 (10.5)	188 (89.5)	0.388
	Muslim	16 (13.4)	103 (86.6)		6 (6.7)	84 (93.3)	
Type of Family	Nuclear	56 (19.4)	233 (80.6)	0.045	23 (12.8)	156 (87.2)	0.011
	Joint	15 (11.5)	116 (88.5)		5 (4.1)	116 (95.9)	
Socio economic status	Upper middle class & above	6 (6.2)	90 (93.8)	0.005	3 (7.1)	39 (92.9)	0.934
	Lower middle class	28 (17.8)	129 (82.2)		10 (8.9)	102 (91.1)	
	Upper lower class	30 (20.7)	115 (79.3)		14 (10.4)	121 (89.6)	
	Lower class	7 (31.8)	15 (68.2)		1 (9.1)	10 (90.9)	
Father education	Illiterate	9 (33.3)	18 (66.7)	0.001	3 (11.1)	24 (88.9)	0.255
	Upto primary	28 (25.5)	82 (74.5)		12 (14.1)	73 (85.9)	
	Upto matric	12 (10.5)	61 (83.6)		7 (8.3)	77 (91.7)	
	High school & above	22 (10.5)	188 (89.5)		6 (5.8)	98 (94.2)	
Mother education	Illiterate	29 (30.9)	65 (69.1)	0.000	10 (17.2)	48 (82.8)	0.007
	Upto primary	26 (25.5)	76 (74.5)		11 (13.3)	72 (86.7)	
	Upto matric	9 (13.4)	58 (86.6)		1 (1.3)	78 (98.7)	
	High school & above	7 (4.5)	150 (95.5)		6 (7.5)	74 (92.5)	
Prelacteal Feed	Given	43 (19.0)	183 (81.0)	0.210	13 (10.9)	106 (89.1)	0.442
	Not given	28 (14.4)	166 (85.6)		15 (8.3)	166 (91.7)	
Feeding in first six months	Only breast milk	25 (13.9)	155 (86.1)	0.128	15 (8.1)	171 (91.9)	0.299
	Breast milk + water	11 (26.8)	30 (73.2)		4 (18.2)	18 (81.8)	
	Others	35 (17.6)	164 (82.4)		9 (9.8)	83 (90.2)	
Complementary feeding	Less than 6 months	16 (34.0)	31 (66.0)	0.001	6 (31.6)	13 (68.4)	0.003
	At 6 months	38 (13.1)	252 (86.9)		18 (7.7)	215 (92.3)	

During baseline survey, 46.2% and in end line survey, 60.3% did not receive pre lacteal feed and this was statistically significant. During the baseline survey, 42.9% were fed only mother's milk in first 6 months, which rose to 62% in the end line survey and this, was found to be statistically significant. Starting complementary feeding at 6 months was 9.8% in baseline study which increased to 77.7% in end line survey and this was statistically significant. Complete immunization was 66.9% during baseline study, but lowered to 61.7% during end line survey. Indoor air pollution was present in 58.6% of the households in baseline survey while in end line survey it was found to be 56%. (Table 2).

During baseline study, type of family, socio economic status, father's education, mother's education, complementary feeding, immunization and indoor air pollution are significantly associated with pneumonia; while during end line survey, type of family, mother's education, complementary feeding and indoor air pollution are associated with occurrence of pneumonia. (Table 3).

Result of focus group discussion:

The slums are dwelled by communities of different caste, creed, and religion. In situations like occurrence of cough, cold and fever, at first some of the caregivers took their children to ojas (local healers) where jhar-fhok was done. After two three days when there is no sign of improvement, then only they are taken to health facilities.

The caregivers prefer to take their children to private practitioners in distant clinics and pay more. The reasons for such preference were poor communication between staff and patients, no good behavior, previous negative experiences and lack of drugs and medicines. They also believed that by paying more the treatment is good.

People believe that pneumonia occurs if there is garbage in and around the dwellings, if the air is bad to breathe, from outdoor air pollution from running vehicles, prolonged exposure to cold. One mother said "the blood gets dried up, children does not like to play; bad breathe from the mouth, difficult breathing cannot eat, have fever." The service providers believe that pneumonia occurs if children drink unfiltered water, and also dumping of garbage around the house.

Discussion:

The term community based is primarily understood with community as the setting defined geographically and is the location where interventions are implemented. Such projects are mainly aimed at changing individual's behavior as a method for reducing the risk of diseases⁽⁸⁾.

In our study, during the baseline survey, the prevalence of pneumonia was found to be 16.9% while at the end of intervention it was found to be 9.3%. With existing

infrastructure and effective implementation of interventions, including intervention for reduction of indoor air pollution, averts mortality from childhood pneumonia by 13-17%⁽⁹⁾. Instead of multiple vertical programmes, integration of childhood immunization and non vaccine interventions like providing education to the care givers on usefulness of breast feeding, reduction of indoor air pollution, improving nutrition, handwashing are proven to be more cost effective, sustainable and efficient⁽¹⁰⁾. Such health promotional interventions can be effectively delivered by the frontline workers working at the community with appropriate training and re training of the workers when needed particularly in resource poor settings which may play a major part in overall lowering of pneumonia incidence. Such health promotional interventions also include locally adaptable behavior change communication⁽¹¹⁾. Behavior change communication is a process of interaction with communities where some tailored messages are given, approaches are taken using a variety of communication channels to develop some healthy behaviours in individuals for whom it is done⁽¹²⁾. Studies from Nepal have shown that, the community members with minimal education can be trained and engaged to deliver safe and effective community based interventions for prevention and control of respiratory infections in children⁽¹³⁾. Community based interventions have shown to increase the care seeking behavior for pneumonia by 13% and also reduction in treatment failure rates by 40 %⁽¹⁴⁾. Well accepted by community, interventions at community level empowers capacity building thereby increases the quality of services which also enhances early diagnosis and treatment⁽¹⁴⁾. Though implementation of preventive and management strategies remains a challenge, yet such preventive interventions are highly effective in reducing disease burden, severity and outcome⁽¹⁵⁾.

Qualitative research helps in understanding the socio cultural, knowledge and information, financial, health facility related barriers. The identified barriers act as deterrents to care seeking and treatment uptake for pneumonia⁽¹⁶⁾. An analysis of these barriers helps in planning certain social and behavior change communication strategies that can be applied in a community based intervention approach to address the modifiable, high risk child care practices in a community with high neonatal mortality rate to improve the child care practices⁽¹⁷⁾.

High priority countries needs effective implementation of increasing outreach activity by community health workers, their supervision and community case management, for reduction of deaths in children⁽¹⁸⁾ which also serves as an effective strategy to complement facility based treatment particularly in areas that have lesser number of facilities⁽¹⁹⁾. Such types of intervention are also recommended by a study

conducted in Nepal where there is limited access to health facility⁽²⁰⁾. Increase coverage of interventions targeting the various risk factors for child mortality, promotion of appropriate care seeking will substantially reduce the burden of pneumonia in community.⁽²¹⁾ The limitation of our study was lower response rate during endline study and frequent movement of population as many of them are migratory workers. Such interventions can be scaled up in other slums as well along with strengthened supportive supervision and cost effectiveness can be studied in future.

Conclusion:

Stepping up community based interventions intensifies care givers awareness, health seeking behavior that can go a long way in lowering the incidence of childhood diseases like pneumonia particularly in areas which experience a high rate of childhood morbidity and mortality which are preventable with timely interventions. Further Operational research will perhaps enhance the learning opportunities.

Conflict of interest: None

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