KAP STUDY

ASSOCIATION BETWEEN MALNUTRITION & COLOSTRUM FOR SEVERE PNEUMONIA

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ABSTRACT

Background: Pneumonia remains one of the main causes of childhood mortality despite the availability of simple, safe, effective and inexpensive interventions to curb its mortality. This could result from sub-optimal care seeking practices and child rearing, supplemented by lack of access to healthcare.We conducted a studyto identify the association of malnutrition and initiation of breastfeeding variables with severe pneumonia and pneumonia/no pneumonia

Objective: To determine association of malnutrition and colostrums intake among children aged 2-24 months admitted in tertiary care hospital for severe pneumonia.

Methods: A total of 288 patients with severe pneumonia were included in this case-control study. Patients were divided into 2 groups with 144 patients in each group selected through non-probability consecutive sampling. Sample size was calculated using WHO sample size calculator keeping power of test at 80%, P1= 1% and P2=7.8%. Data was analyzed through SPSS version 19 and p-value < 0.05 considered as significant. Association between study variables and severe pneumonia was computed using Chi Square Test.

Results: Mean age for group A (67 males and 77 females) was 13.00±6.40 months and group B (78 males, 66 females) 12.83±6.90 months. Malnutrition was seen in 41% of group A and 17.4% of group B patients. Colostrum intake (Initiation of breast feeding with 72 hours) was reported in 78.5% of group A and 79.2% of group B. There was a significant association of malnutrition with severe pneumonia (p=0.000) whereas, no significant relation was found with colostrum intake (p=0.885).

Conclusion: Malnutrition was significantly associated with severe pneumonia. Colostrum was the most prevalent factor in both groups but the difference was insignificant.

KEYWORDS: Malnutrition, Colostrum, pneumonia, child mortality, breast feeding, immunization, measles, infant, low birth weight

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INTRODUCTION

Pneumonia remains the main cause of child mortality despite the availability of simple, safe, effective and inexpensive interventions to curb its mortality. Poverty is the major cause of childhood pneumonia and it results from sub-optimal care seeking practices and child rearing, supplemented by lack of access to healthcare.[1] In low-income countries, the leading cause of childhood death is pneumonia, accounting for 18% of deaths in children under 5 years of age.[2] Each year 151 million new cases are identified, of which 7–13% require hospitalization.[3] In Pakistan pneumonia is also a primary cause of mortality under-five years of age with approximately 10 million cases occurring each year.[2] The mortality rate is 14.1% due to pneumonia .[4] The surveillance study conducted in Pakistan using WHO/UNICEF classification according to IMCI criteria (WHO & UNICEF 2000), reported 1039 clinical cases of pneu-

monia, of which 54 (5.2%) were severe pneumonia and 4 (0.4%) were cases of very severe disease. The overall incidence of pneumonia for the period was 0.26 (95% CI: 0.25–0.28) cases per child-year.[5] The risk factors of severe pneumonia include poverty (i.e. low socioeconomic status), lack of immunization, previous history of pneumonia, indoor air pollution, overcrowding, malnutrition/poor nutritional practices, history of measles, lack of initiation of breastfeeding for >72 hrs after birth (i.e. child did not receive colostrum), and low birth weight.[6] In a case control study conducted in Pakistan in 2002, lack of immunization (cases=49.70%, controls=39.25%), previous history of pneumonia (cases=52.24%, control=42.07%), initiation of breastfeeding within 72hrs after birth (cases=70.56%, controls=61.66%) were reported as important risk factors for pneumonia.[7] Another case control study conducted in Kenya also reported malnutrition (in cases=7.8%, control=1.0%) as a risk factor of pneumonia.[8]

The present study was conducted to identify the association of malnutrition and initiation of breastfeeding variables in children with severe pneumonia (group A) and pneumonia/no pneumonia (group B).

METHODS

For children aged 2-59 months we used the classification of acute respiratory tract infection reported by Fatmi & White (2002) in accordance with WHO ARI guidelines[7].

No pneumonia (cough and cold): The children were diagnosed to have no Pneumonia if Respiratory rate per minute was < 50 for infants aged 2- 11 months and < 40 for the children aged 12-59 months with no chest indrawing.[7]

Pneumonia: The children were diagnosed to have Pneumonia if respiratory rate per minute is >50 for infants aged 2-11 months and >40 for the children aged 12-59 months with no chest indrawing.[7]

Severe pneumonia: Children were diagnosed to have severe Pneumonia when having chest in drawing with fast breathing.[7]

Initiation of Breastfeeding (colostrum): If child did not receive breastfeeding (colostrum) within 72 hours after birth, it can also be a risk factor of pneumonia because colostrum can provide protection to a child from pneumonia.[11]

Children will be classified to be malnourished based on the mid arm circumference. A child will be considered as malnourished if the mid-arm circumference is less than or equal to 12.5 cm.[9]

This study was conducted after approval from College of Physicians and Surgeons Pakistan. 100 cases and controls admitted in the Pediatric ward of Ziauddin Hospital, fulfilling the inclusion and exclusion criteria, were included in the study. Informed consent was taken from each patient's guardian to participate in this study and details about this research were explained prior to enrolment. The study was conducted according to the ethical guidelines of Pakistan Medical and Research Council (PMRC).

A proforma was used to document findings relating to demographics (name and age), gender, hospital registration number, initiation of breast feeding within 72hrs after birth and mid arm circumference of the child according to recommended standard procedures. Independent observer (i.e. one who did not participate in the study) filled all the proformas.

Data was analyzed using SPSS version 19 software. Frequency and percentages were used to assess the categorical variables like malnutrition (Yes/No) and initiation of breast feeding within 72hrs after birth (Yes/No). Association between subjects (cases/controls) and factors were computed using chi square test. Odds ratio along with 95% confidence interval were computed. To control the effect modifiers, stratification was done with regard to age and gender to control the effect of these factors on outcome variables (Initiation of breastfeeding after birth and malnutrition) through chi-square test. P-value < 0.05 was taken as significant. Qualitative variables were presented in terms of frequency and percentages. Quantitative variables were presented in terms of mean and standard deviations. Post stratification chi square test was applied.

RESULTS

A total of 288 patients of either gender with age between 2 to 24 months, in accordance with the inclusion criteria were enrolled in the study to determine the association of common risk factors like malnutrition and initiation of breastfeeding within 72 hrs after birth (colostrum) for severe pneumonia. The study subjects were divided into two groups, each having 144 subjects: group A (case group) and group B (control group).

The results showed that in group A (cases), there were 67 male and 77 female patients with mean age of 13.00±6.40 months, whereas in Group B (control), there were 78 male and 66 female patients with mean age of 12.83±6.90 months. 41% in the case group were malnourished in contrast to 17.4% in the control group. Data regarding initiation of breast feeding within 72 hrs of birth (colostrum) revealed 78.5% initiated breast feeding within 72 hours in group A (case group), and 79.2% in group B (control group).

Table 1 : Frequency And Association Of Initiation Of Breast Feeding Within 72hrs Of Birth With Study Group According To Gender, Age, Duration Of Pneumonia

			STUDY GROUP		TOTAL	P-Value	Odds ratio	95% C-I
			Group A	Group B				
Gender	Male (n=145)	Yes	52	64	**116**	0.505**	0.758	0.33-1.71
		No	15	14	**29**			
	Female (n=143)	Yes	61	50	**111**	0.620**	1.220	0.55-2.68
		No	16	16	**32**			
Age Group	≤12 months (n=150)	Yes	62	63	**125**	0.609**	1.253	0.52-2.97
		No	11	14	**25**			
	>12 months (n=138)	Yes	51	51	**102**	0.566**	0.800	0.37-1.71
		No	20	16	**36**			
Duration of pneumonia	≤3 days (n=148)	Yes	54	60	**114**	0.568**	0.800	0.37-1.72
		No	18	16	**34**			
	>3 days (n=140)	Yes	59	54	**113**	0.704**	1.177	0.50-2.72
		No	13	14	**27**			

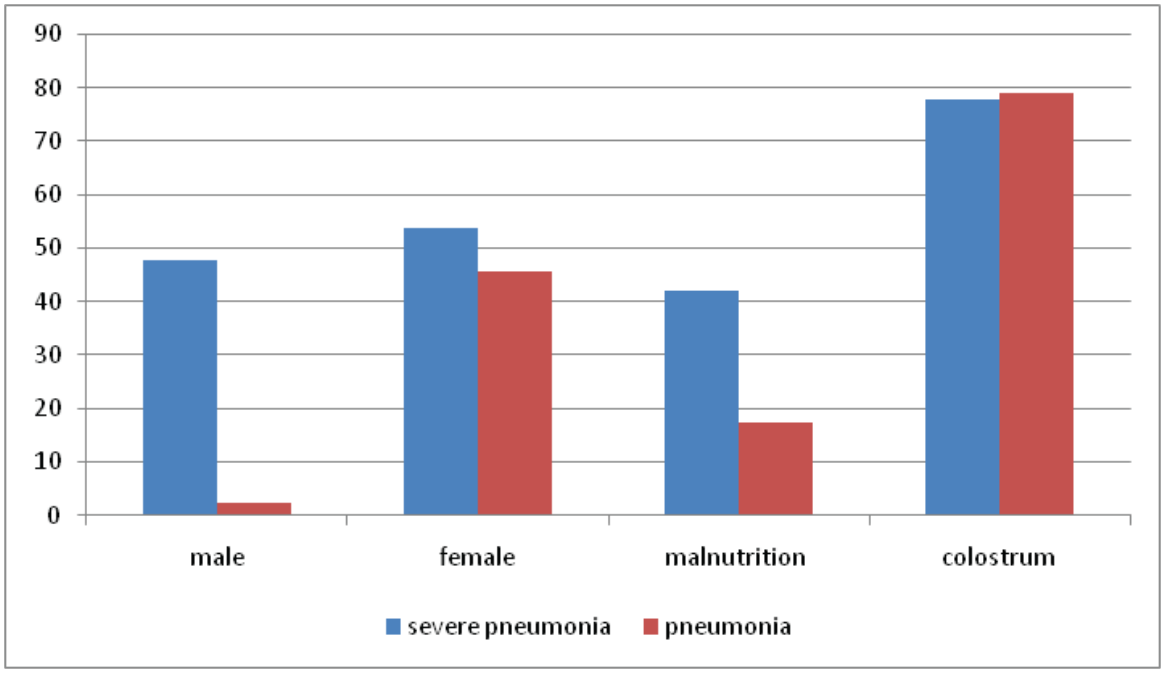

Figure: 1 Frequency And Association Of Iniation Of Breast Feeding Within 72 Hours Of Birth With Study Groups.

Table: 2 Frequencies And Association Of Malnutrition And Colostrum With Study Group According To Age & Gender.

	Group A (Cases) (n=144)	Group B (Control) (n=144)	p-value	Odds Ratio	
Age (months)	13.00±6.40	12.83±6.90			
Gender					
Male	67(46.5%)	78 (54.2%)			
Female	77 (53.5%)	66 (45.8%)			
Malnutrition	59 (41%)	25 (17.4%)	0.000	3.304	Significant
Colostrum	113 (78.5%)	114 (79.2%)	0.885	0.959	Insignificant

Chi Square test of association showed that there was significant association of malnutrition (p=0.000) with severe pneumonia. While no significant association was found with initiation of breastfeeding within 72 hours after birth (colostrum) (p=0.885) with severe pneumonia patients.

DISCUSSION

This study aimed to identify the risk factors of pneumonia or severe pneumonia in children aged 2-59 months. Independent risk factors for severe pneumonia include comorbidity or exposure to upper respiratory tract infection of household members and delay in seeking medical treatment. Prior to a visit to the hospital, treatment with antibiotics is of benefit as well as protective.

Severe pneumonia is identified twice more in those children who delay medical treatment by three days or more. This finding is similar to a study conducted in Uganda, which reports the mean period of illness to be seven days before care is needed.[12] According to another study in Uganda majority of the people taking home medication before going to the health care facility also accounts for a delay in medical care. In these cases treatment was deferred despite the fact that there was immediate identification of symptoms.[13]

If pneumonia progresses rapidly and the action to be taken delayed, it can leads to more severe disease or even death.[14] This delay in seeking care might be due to various inappropriate or inadequate pre-hospital home treatments. WHO report similar delay in seeking proper medical treatment as children are treated at home by traditional curer or through unofficial medical institutes in the community. These practices are an important barrier in reducing childhood mortality.[15]

Hildenwall et al suggests that children can be protected from severe pneumonia by taking antibiotics at home. In 2004, World Health Organization advised oral antibiotics for the treatment of non-severe pneumonia with oral antibiotics at the community level by trained community health workers.15 A metaanalysis of clinical trials shows 36% decline in child mortality under the age of five years with pneumonia when antibiotics are administered by trained community health workers.[21] An update to the above meta analysis reports that childhood mortality under the age of five years is 70% reduced by community case management.[22]

A randomized clinical trial was carried out in rural Pakistan, in which children suffering with severe pneumonia were randomized to take oral amoxicillin at home or cotrimoxazole and then referred to a health care facility, identified treatment failure at equal level among the two groups.[23] This shows that severe pneumonia can be successfully treated with oral amoxicillin at the community level in resource poor settings.

The role of birth weight with ALRI (Acute Lower Respiratory Infection) mortality was also reported. 64 Low birth weight infants had approximately a 50% greater risk of pneumonia compared with newborns weighing ≥2500 g. Given the retrospective nature of the present study, it was not possible to separate preterm from growth-retarded infants. Low birth weight may contribute to pneumonia through the decreased immune response of low birth weight infants [24,25] and through impaired lung function [26,27] due to reduction of the diameters of major airways or an obstruction of peripheral airways.

Laura et al conducted a randomized systemic literature review and metaanalysis to study the risk of Pneumonia & its morbidity & mortality in relation to breast feeding exposure among infants & young children > 24 month of age. They concluded that breast feeding in first 23 months of life is highly recommended for Pneumonia prevention.[28]

Steward Jackson et al. performed a meta-analysis and conducted a quality assessment of all selected studies according to GRADE criteria to report odd ratios (with 95% confidence intervals) of different risk factors like lack of exclusive breastfeeding, low birth weight, exposure to indoor air pollution, crowding, under nutrition – weight-for-age less than 2 standard deviations, incomplete immunization, and HIV infection. They concluded that these seven risk factors play an important role for developing Pneumonia in children under five years of age[29]. An update to the above meta analysis estimates that childhood mortality under the age of five years is 70% reduced by community case management.[30] The higher prevalence of pneumonia (62.72%) and frequency (1.85) of pneumonia was found in children under 12 months of age.[31] Malnutrition and pneumonia had clear evidence of association, which was strongest between severe malnutrition and severe pneumonia.[32]

CONCLUSION

Malnutrition was significantly associated with severe pneumonia. Colostrum was the most prevalent factor in both groups but the difference was insignificant.

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