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Original Research Article

A study of clinical profile and outcome of pneumonia associated with traditional child rearing practices in infants

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ABSTRACT

Background: Customs and traditions are strictly followed in many Indian families, both rural and urban. Certain established child rearing practices are being advocated by elders and are being followed traditionally even today. Many of these practices play a significant role in causing pneumonia in children. This study was undertaken to compare and assess the clinical features and outcome of pneumonia occurring in children with traditional rearing practices and in infants without traditional child rearing practices and various factors influencing them.
Methods: The present study is a prospective case control study, done in the department of paediatrics, Al-Ameen Medical College and Hospital Vijayapura, in which a total of 220 infants with clinical and/or radiological signs of pneumonia were enrolled during the period of March 2022 to February 2023.
Results: 73 out of 220 infants (33%) with pneumonia had history of traditional child rearing practices. Demographic factors like combined families, young and illiterate mothers, lower socioeconomic status, domiciliary deliveries were found to be statistically significant. Increased clinical severity and prolonged outcome (60.4%) and complications (42.5%) were found to be more in pneumonia in infants associated with traditional child rearing practices.
Conclusions: This study showed increased clinical severity and prolonged outcome and more complications of pneumonia in infants associated with traditional child rearing practices. High mortality (7.5%) was also seen. Most common traditional child rearing practices influencing outcome in infants are oil bath and blowing into the nose. Thus there is an urgent need to systematically study the utility, futility and possible dangers of a large number of traditional child rearing practices followed in infants.

Keywords: Traditional child rearing practices, Pneumonia in infants

INTRODUCTION

Traditional practices are time honoured rituals and beliefs which are prevalent in a community and they may pertain to a wide range of activities. The customs and cultural practices pertaining to mother craft and child care are passed on from one generation to another. The traditional practices are influenced by the educational level, socio-economic status and value system of the family and society.

Customs and traditions are strictly followed in many South Indian families both rural and urban. Certain established child rearing practices are being advocated by elders and are being followed traditionally. Under the influence of elderly ladies of the family and neighbourhood, even the educated and urban elites are also, to some extent, not exempted from the traditional cultural practices. Community data does indicate a strong influence of various cultural practices in the causation of morbidity and mortalities of children.[1]

Traditional health care practices can be categorized into four main sub-groups: useful, harmful, innocuous and of uncertain utility.

Some South Indian families use either gingili oil or coconut oil for head bath. Some use white of egg, soap nut powder, green gram/Bengal gram powder during head bath or oil bath. Before the children are bathed, gingilli oil or coconut oil is applied liberally over the scalp and also over the body; finally, oil is instilled into the nose, eyes and ears. Instillation of oil into eyes and nose results in conjunctival irritation, sneezing and rhinorrhoea. Further it is possible that the vigorously crying child can aspirate water, bathing materials along with throat and nasal secretions. After the bath, the child is then exposed to a dense smoke of myrrh produced by sprinkling the powdered myrrh over the glowing charcoal fire. Soon after the inhalation of this smoke the child develops severe cough and sneezing, followed by profuse nasal discharge. With years of experience, the elders in the families and dais alike claim that they are technically skilled in the practice of blowing into the nose with a hope to dislodge the nasal secretions. The sudden increase in airway pressure is likely to produce impaction of betel nut debris or contaminated nasal or pharyngeal secretions into the airways of infants, leading to pneumonia in some children and in some, leads to persistent pneumonia. Clearance of throat secretions was undertaken in some children by two different methods. In finger-mouth suctioning method, they introduce the right index finger into the oropharynx and then scoop out the thick throat secretion with their hooked finger. During this procedure the uvula and posterior pharyngeal wall are stimulated and the child develops retching and vomiting. Mouth to mouth vigorous suction is also done.[2-6] Harmful practice of instillation of vegetable oil (usually gingili oil) into the child's nose and mouth is done as a cure for respiratory infections is a widespread custom in rural and some urban areas of North Karnataka.[7-9] Healthy children probably having a viral respiratory illness when subjected to this practice eventually develop more serious complications like lipoid pneumonia usually accompanied by bacterial sepsis. This oil instillation is a septic procedure enabling direct inoculation of bacteria into the child's lungs. Occasionally when neem oil is used for the same custom, children present with encephalopathy and seizures.

X-ray findings are non-specific which include alveolar consolidation and ground glass opacities.[10,11] Laboratory tests usually show peripheral blood polymorphonuclear leukocytosis with an elevated erythrocyte sedimentation rate. The cytological demonstration of lipid-laden macrophages in the broncho-alveolar lavage is a characteristic feature.

Lipoid pneumonia can be staged as- I stage: interstitial proliferative inflammation with exudative pneumonia, II stage: diffuse chronic proliferative fibrosis and superimposed acute bronchopneumonia, and III stage: multiple localized nodules, tumour like paraffinomas.

Pneumonia is an inflammation of the parenchyma of the lungs. Most cases of pneumonia are caused by microorganisms but there are a number of non-infectious causes that sometimes need to be considered. These non-infectious causes include but are not limited to, aspiration of food and/or gastric acid, foreign bodies, hydrocarbons and lipoid substances, hypersensitivity reactions and drug/radiation induced pneumonias.[12]

Pneumonias are classified on an anatomic basis as a lobar/lobular, alveolar or interstitial process but classification of infectious pneumonias on the basis of presumed/proven etiology is diagnostically and therapeutically more relevant.

The most common bacterial causes of pneumonia in the normal child are *S. pneumoniae, H. influenzae type B, S. pyogenes and S. aureus.* The most common viruses causing pneumonias include respiratory syncytial virus (RSV), para influenza, influenza and adenoviruses.

Clinical manifestations of viral pneumonia include rhinitis and cough, multisystem involvement along with presence of fever with similar complaints among other family members. Tachypnea, intercostal, subcostal and suprasternal retractions, nasal flaring are seen. Cyanosis and respiratory fatigue may be seen in severe infections. Chest auscultation reveals ronchi and crepitations. Radiological findings include diffuse infiltrates, usually in perihilar region with scattered area of atelectasis. Peripheral white blood cell count tends to be normal or slightly elevated with lymphocyte predominance. Definitive diagnosis includes virus isolation from a specimen obtained from respiratory tract.[13-16]

Clinical manifestations of bacterial pneumonia are extremely diverse with non-specific signs and symptoms like fever, chills, headache, malaise, irritability and restlessness. LRTI signs include tachypnea, dyspnea, grunting, chest retractions and cyanosis. Pneumonia may also manifest other features common to septicaemia and meningitis. This includes convulsions, lethargy, unconsciousness, poor feeding, and fever. Cough with expectoration of sputum is common in older children. Decreased breath sounds with presence of crackles are characteristic of pneumonia in infants. Signs in older children include dullness to percussion, decreased vocal fremitus and decreased breath sounds with fine crackles over the involved area. Radiological findings include segmental consolidation and air bronchograms on chest radiograph. Peripheral white blood cell count tends to be elevated with neutrophil predominance. Definitive diagnosis includes isolation and culture of the organism from a specimen obtained from respiratory tract.[17-19]

Most of the previous studies showed male child preponderance, lower socioeconomic standards, low educational status and ignorance regarding available health facilities. Traditional child rearing practices like oil instillation and nose blowing were consistently found to be

statistically significant. This study was undertaken to assess the clinical profile and outcome of pneumonia following those traditional child rearing practices in infants.

METHODS

A sample size of 220 infants admitted to the PICU and wards of tertiary care hospital at the department of paediatrics, Al-Ameen Medical College and Hospital with clinical and/or radiological signs of pneumonia during the period of March 2022 to February 2023. The institutional ethical committee approved the study. Systematic random sampling technique was used and prospective case control study was conducted.

Inclusion criteria

All infants admitted with pneumonia in age group 29 days to 1 year during the study period.

Exclusion criteria

Neonates, babies institutionally delivered and admitted for some ailments during neonatal period and beyond, infants with known history of wheezing, children predisposed to pneumonia like left to right shunting, and congenital malformations, children with systemic disorders causing respiratory distress like cardiac, renal, central nervous system or metabolic problems.

Infants with clinical and radiological evidence of pneumonia were selected as per the selection criteria. After eliciting necessary history some children were excluded using exclusion criteria.

Detailed questionnaire including various traditional child rearing practices like, oil bath, oil instillation into nose, ear and mouth, blowing into the nose, mouth to mouth suctioning, finger-mouth suctioning, application of irritant myrrh/sambrani fumes and giving native medications, was prepared and the accompanying person with the infant was asked. All necessary investigations were done. X-rays were analysed during admission for evidences in the form of bronchopneumonia, patchy opacities, consolidation, pneumatoceles, and pyothorax. Further details of family which may influence the disease outcome like type of family, religion they follow, socio-economic status, antenatal care during pregnancy, place of delivery and feeding practices were also obtained. Nutritional status was assessed using ICMR chart.

The clinical parameters used are duration of fever after admission, if present earlier, duration of significant respiratory distress i.e. Downe score >3, duration of difficulty in taking usual feeds, requirement of supplemental O_2, IV fluids and ICU setting care, any requirement for II line antibiotics and the clinical outcome. By systematic random sampling technique, a total of 73 cases and controls were taken to compare and assess the clinical features and outcome of pneumonia occurring in infants with traditional child rearing practices and in infants without traditional child rearing practices and to assess the various factors influencing traditional child rearing practices and to assess the influence of individual traditional child rearing practices with the outcome of pneumonia occurring in those infants. The results were analyzed with IBM statistical package for the social sciences (SPSS) version 25 for Windows.

RESULTS

During the study period, the patient attendance in outpatient census was 44750. Out of this, 220 infants had clinical symptoms and signs and with radiological signs of pneumonia, i.e. 7/1000. Out of 220, 73 infants had history of traditional CRP i.e. 33%. On analyzing all infants with pneumonia, 42.5% infants of <3 months had pneumonia when compared to the age group of 4-6 months (30.0%) and 7-12 months (27.5%) and is statistically significant. Also traditional CRP is done in 72.5% of <3 months old infants when compared with other age groups and is statistically significant. On comparing and analyzing the clinical parameters between pneumonia in infants associated with traditional CRP and with pneumonia not associated with traditional CRP it is found that prolonged fever (17.5%), prolonged respiratory distress >3 (67.5%), prolonged need for oxygen supplementation(68.8%), prolonged difficulty in taking feeds (70%), prolonged need for intra venous fluids (61.3%), prolonged ICU care (77.5%) was found to be associated with pneumonia in infants associated with traditional CRP. On analyzing the complications associated with pneumonia, it is found to be more in pneumonia in infants associated with traditional CRP (42.5%). Requirement of II line antibiotics was more in pneumonia in infants associated with traditional CRP (86.3%) when compared with pneumonia in infants not associated with traditional CRP (12.5%). Death was found to be more in pneumonia in infants associated with traditional CRP (7.5%) when compared to pneumonia in infants not associated with traditional CRP (1.3%). But majority of the infants have improved in both the groups.

Table 1: Demographic profile of traditional child rearing practices.

Age group (months)	Total n=220 (%)	Group		Significance	
		Study, n=73 (%)	Control, n=147 (%)	χ^2	P[2]
<3	42.5	72.5	27.5		
4-6	30	20	35	35.47	0.001
7-12	27.5	7.5	37.5		

Table 2: Comparison of clinical parameters between study and control groups.

Parameters	Group		Significance	
	Control group, n=73 (%)	Study group, n=73 (%)	χ^2	P value
Fever up to				
Nil	4 (6.3)	5 (7.5)	12.8	0.002
<48 hours	67 (92.5)	54 (75)		
>48 hours	1 (1.3)	10 (14.5)		
Respiratory distress score > 3				
<48 hours	69 (95)	23 (32.5)	67.6	0.001
>48 hours	3 (5)	49 (67.5)		
O_2 supplementation				
<48 hours	67 (92.5)	22 (31.3)	69.8	0.001
>48 hours	5 (7.5)	50 (68.8)		
Difficulty in taking feeds for				
<48 hours	69 (95)	21 (30)	72.1	0.001
>48 hours	3 (5)	51 (70)		
IV fluids needed for				
<48 hours	67 (92.5)	28 (38.8)	57.1	0.001
>48 hours	5 (7.5)	44 (61.3)		
ICU care				
<48 hours	65 (90)	16 (22.5)	74.06	0.001
>48 hours	7 (10)	56 (77.5)		
Complications				
No	67 (92.5)	42 (57.5)	26.1	0.001
Yes	5 (7.5)	31 (42.5)		
Requirement of II line antibiotics				
No	63 (87.5)	10 (13.8)	87.4	0.001
Yes	9 (12.5)	63 (86.3)		
Clinical outcome				
Death	1 (1.3)	5 (7.5)	3.84	0.05
Improved	72	67 (92.5)		

DISCUSSION

Traditional child rearing practices are being done in early infancy which is the vulnerable group, irrespective of sex and locality, they have hospital visits initially for minor illness like noisy breathing and practices are followed thereafter. These practices are followed in families irrespective of the religion they follow. Nuclear family employs some elderly persons nearby but in combined and joint families' grandmother has most of the influence on these child rearing practices. Mother being young and less literate has more influence on performing these practices as they lack knowledge about the harmful effects. Families belonging to lower socioeconomic status engage more in these practices. Knowledge about the health care providers in terms of ante natal care and the deliveries influence these practices to reduce as these are the areas that the mother and the family has some motivation not to perform those practices. Oil instillation into nostrils is associated with risk of development of lipoid pneumonia due to aspiration, which needs prolonged follow-up.

Most of the previous studies showed male child preponderance, lower socioeconomic standards, low educational status and ignorance regarding available health facilities. Traditional child rearing practices like oil instillation and nose blowing were consistently found to be statistically significant.[1-6]

In the present study, on analyzing all infants with pneumonia, 42.5% infants of <3 months had pneumonia when compared to the age group of 4-6 months (30.0%) and 7-12 months (27.5%) and is statistically significant.

In a study by Jayakumar et al (2019) at Institute of Child Health found that 76% of ARI are bronchopneumonia. Male: female is 1.8:1.3, of them 76.2% are infants. This study however includes all children and reveals the common age group infants.[20]

In this study, the incidence of the traditional CRP in both sexes showed no significant difference. But A Balachandran et al, in their study of 131 cases of persistent/recurrent pneumonia, showed that boys are affected twice than girls for which it was attributed that to the fact that male children enjoy a preferential care over the female children.[1]

In this study most of the infants with pneumonia belonged to class IV and class III of modified Kuppusamy scale of socio-economic status. Studies done in Pondicherry by Narayanan et al showed the same features. This may be attributed to low educational status and ignorance regarding available health facilities which makes them perform these traditional child rearing practices.[21]

Infants admitted with pneumonia usually have fever, though it is not well pronounced in young infants as they can present with hypothermia similar to those partially treated outside with antibiotics and antipyretics. Fever when prolonged inspite of appropriate treatment may be due to severe infection, drug resistant and atypical organisms. Respiratory distress at the time of admission was assessed with Downe's scoring in which respiratory rate, chest retractions, grunt, cyanosis and air entry was taken into account and was used during the course of treatment in the ward. Those infants who had only fast breathing were taken as improved. Oxygen supplementation was given to infants with significant respiratory distress. Infants, who had difficulty in taking usual feeds due to illness, were given appropriate IV fluids for the period of requirement. Those who had improved were started on partial IV fluids, guarded feeds with cup and spoon or palladai. Sick looking infants and ones with intermittent respiratory distress were observed for more time in the ICU. Infants who developed septicemia, seizures, shock, empyema and pneumothorax during the illness were taken as complications of the disease and were managed appropriately. Change of antibiotics from I line to next line of antibiotics was done in infants with complications. Though most cases of pneumonia improved well the mortality appeared to be more in pneumonia cases following traditional child rearing practices. Overall morbidity in these infants is more when compared to infants with pneumonia not followed by traditional child rearing practices.

There is no comparable study in the aspect where the clinical parameters in pneumonia are influenced more by traditional child rearing practices, which is seen in this study.

The current study is limited to the age group of infants only whereas traditional child rearing practises in the neonatal period have also been attributed to different conditions. This study is also limited to pneumonia in infants but involvement of skin, GIT, CNS has also been found in many conditions attributed to traditional child rearing practises in both infants and neonates.

CONCLUSION

This study showed increased clinical severity and prolonged outcome and more complications of pneumonia in infants associated with traditional child rearing practices. High mortality (7.5%) was also seen. Most common traditional child rearing practices influencing outcome in infants are oil bath and blowing into the nose. Thus there is an urgent need to systematically study the utility, futility and possible dangers of a large number of traditional child rearing practices followed in infants.

Recommendations

Inclusion of other age groups like neonates and toddlers and the study of other systemic involvement will further expand our knowledge and understanding on the effects of traditional child rearing practises on growing children. Mother's optimal age at marriage, child birth, better educational status and promoting institutional delivery will have favourable influence on reducing these traditional child rearing practices. Team approach concepts are needed and more social workers and paramedical staff should be in attendance at the OPDs to educate the mothers on various child rearing practices.

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REFERENCES

1. Balachandran A. Traditional child rearing practices in children with persistent and recurrent pneumonia. Indian Medical Gazette. 190;CXXXIV(12):388-91.
2. Gupta ML, Dave DS, Thawrani YP, Mathur PS. A review of child rearing practices prevalent in the families of hospitalised children at Gwalior. Indian Pediatr. 1980;17(3):261-5.
3. Shukla RS, Bhambal SS, Bhandari WB. Study of superstitious practices in under-fives. Indian Pediatrics. 1979;16:403.
4. Mathur GP, Kushuwala KP. Superstitions in pediatric practices, editorial. Indian Pediatrics. 1976;23:159.
5. Kushwaha KP, Mathur S, Singh. YD, Seti TR. Superstitious therapy during illness of pre-school children. Indian Pediatrics. 1986;23:163-8.
6. Krishnamurthy, Rajagopal T. Folklore and child rearing practices in South India. Current topics in paediatrics. Interprint. 207;507.
7. Mahadevan S, Anantha Krishnan S, Srinivasan S. Lipoid pneumonia in South Indian Infants. Indian Pediatrics. 1991;28:1529-30.
8. Balakrishnan S. Lipoid pneumonia in infants and children in South India. Br Med J. 1973;4:329-31.
9. Adhisivam B, Mahadevan S. Oil that spoils the child. Indian J Pediatrics. 2006;73:544.

10. Bandla HP, Davis SH, Hopkins NE. Lipoid pneumonia: a silent complication of mineral oil aspiration. Pediatrics. 1999;103(2):E19.
11. Furuya ME, Martinez I, Zuniga-Vasquez G, Hernandez Contreras I. Lipoid pneumonia in children: Clinical and imageological manifestations. Arch Med Res. 2000;31:42-7.
12. Robbins SL, Cotran RS, Kumar V. Pathologic basis of disease. Elsevier. 2003;479-80.
13. Peter G. The child with pneumonia: Diagnostic and therapeutic considerations. Pediatr Infect Dis J. 198;7:453.
14. Suhutze GE, Joacob RF. Management of Community acquired bacterial pneumonia in hospitalized children, Pediatr Infec Dis J. 1982;11;60.
15. McCarthy PL, Spiesel SZ, Stashwick CA. Radiographic findings and etiologic diagnosis in ambulatory childhood pneumonias. Clin Pediatr. 1981;20:686-91.
16. Friis B, Eiken M, Hornsleth A, Jensen A. Chest X-ray appearances in pneumonia and bronchiolitis. Correlation to virological diagnosis and secretory bacterial findings. Acta Paediatr Scand. 1990;79(2):219-25.
17. Smyth A, Carty H, Hart CA. Clinical predictors of hypoxaemia in children with pneumonia. Ann Trop Paediatr. 1998;18:31-40.
18. Bahl R, Bhan MK. Clinical management of acute respiratory infections in children. An Nestle. 2000;58:49-57.
19. Kuhn JP, Slovis TL, Haler J. Caffey's Pediatric Diagnostic Imaging. 10th Edition. Volume I. Mosby. 2003;994-1006.
20. Mohanraj R, Kumar S, Jayakumar S, Agarwal M, Dhingra B, Jeyaseelan V, et al. Where do mothers take their children for pneumonia care? Findings from three Indian states. PLoS One. 2019;14(4):e0214331.
21. Narayanan I, Puri RK, Dhanabalan M, Rao DC, Fernandez A, Balakrishnan S. Some infant feeding and rearing practices in a rural community in Pondicherry. Indian Pediatr. 1974;11(10):667-71.

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