

Study of Acute Respiratory Infections in Breast Fed Babies between Six Months to Two Years of Age in North Karnataka Population

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Abstract:

Background: Acute respiratory infections in breast-fed babies are a major cause of morbidity and mortality in underdeveloped countries like India. Various etiologies of ARI have to be ruled out and treated efficiently.

Method: 90 (ninety) babies between 6 months to 2 years of age with ARI were studied and compared with the same number of controlled groups. Routine blood examinations, including CBC, ESR, PS, AEC, chest x-ray, and PFT, were done only if necessary.

Results: Comparison of social-demographic parameters like gestational age, premature birth, mean weight of birth, caesarean birth, employment of mother, siblings, and habits of parents had a significant p value ($p < 0.001$). In comparison of breast feeding 60 (± 3.6) in patients with exclusive breast feeding before onset of symptoms babies and 72 (± 5.2) in controlled, t test was 18 and $p < 0.00$. Never breastfed patients were 25 (± 3.3) in ARI and 13 (± 2.6) in the controlled group, t test 27 and $p < 0.001$.

Conclusion: It is confirmed that malnourished babies are more prone to ARI and need to be correlated with breast-fed babies. Nutritional supplementation must be recommended along with treatment for early recovery.

Keywords: breast feeding, birth weight, nutrition, premature birth, employment.

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Introduction

Acute respiratory tract infections are a major cause of mortality in children and have particular significance in developing countries like India [1]. Different studies have explored and confirmed the role of clinical and socio-economic risk factors for respiratory tract infections, including birth weight, gestation age, socio-economic status, ethnicity, number of siblings, daycare attendance, and parental smoking [2]. Breastfeeding is included among the protective factors for respiratory infections in infants.

Most studies confirm the protective role of breast feeding against acute respiratory infections (ARI) in the long term, as the outcomes are often measured after 6 months of age up to six years, showing a persistent protective effect even after breast feeding has been stopped [3].

Infant protection seems to be time-dependent. It is reported that breast fed <4 months had a significantly higher risk of hospitalization for infectious diseases in the first year of life. It is also noted that infants who were breast-fed for 4-6 months showed a higher risk of both pneumonia and recurrent otitis media compared to those who were breast-fed for more than six months [4]. ARI can be classified as

an acute upper respiratory tract infection, including common cold, pharyngitis, tonsillitis, sinusitis, and otitis media, while epiglottitis, laryngitis, croup syndrome (acute laryngo-tracheobronchitis), bronchitis, and pneumonia are acute lower respiratory tract infections.

Various risk factors associated with ARI include malnutrition, lack of immunization, poor breast feeding practices, and a low birth weight. Hence, attempt is made to evaluate ARI in breast-fed babies in 6 months to 2 years.

Material and Method

90 babies, aged between six months to two years, were admitted to the pediatrics department of ESIC Medical College Kalaburgi, Karnataka-585106 was studied.

Inclusive Criteria: The babies up to 2 years of age with ARI are included in the study.

Exclusion Criteria: Babies with chronic respiratory ailments, any congenital defects in lung, pulmonary tuberculosis were excluded from the study.

Method:

The babies with ARI were admitted for further evaluation and treatment. The routine blood examinations were complete blood counts (CBC), which included Hb%, differential counts, platelet counts, and hemocrit values. Absolute Eosinophilia (AEC) was done. In relevant cases, a chest -x-ray and pulmonary function test were done if necessary.

The diagnostic criteria included history of nasal discharge, cough, and fever; hurried breathing; chest pain in drawing; and refusal of feeds used to assess an episode of ARI. Respiratory rate >60/minute (among 3 <months, infants), >60 (2.11 months), and >40 (1–5 years) in a child with cough, cold, or fever, singly or in combination, are the criteria for recognition of pneumonia, history of ARI episodes, and history of ARI in the family members. The immunization status and diet history were also noted. Nutritional status was assessed with parameters like weight, height, and mid-arm circumference was also recorded.

The duration of the study was from July 2023 to April 2024.

Statistical analysis: Various findings of the ARI and controlled groups were compared with a t test, and significant results were noted. The statistical analysis was carried out in SPSS software. The ratio of male and female babies was 2:1.

Observation and Results

Table 1: Socio-demographic study of acute respiratory infections in breast-feeding babies between six months to two years of age.

Table 1: Socio –demographic study in acute respiratory infections in breast feeding babies between six months to two years of age

| Sl No | Particular | Respiratory infected babies (90) | Controlled healthy groups (90) | t test | p value |
|-------|-----------------------------------|----------------------------------|--------------------------------|--------|---------|
| 1 | Gestational age (weeks) | 37.4(± 2.5) | 38.7(± 1.8) | 4.003 | P<0.001 |
| 2 | Premature birth | 28(± 5.1) | 14(± 3.2) | 22 | P<0.001 |
| 3 | Birth weight (Kg) | 3.0(± 0.4) | 3.4(± 0.5) | 12.4 | P<0.001 |
| 4 | Caesarean Birth | 60(± 5.6) | 46(± 3.8) | 19.6 | P<0.001 |
| 5 | Employed Mother | 65(± 9.2) | 43(± 5.2) | 19.2 | P<0.001 |
| 6 | One or more brother | 70(± 2.5) | 48(± 1.8) | 67.7 | P<0.001 |
| 7 | Smoker or chewing tobacco mother | 18(± 5.6) | 12(± 3.3) | 8.7 | P<0.001 |
| 8 | Smoking or tobacco chewing father | 45(± 4.6) | 30(± 1.6) | 29.2 | P<0.001 |

- Gestation age (weeks): 37.4 (± 2.5) in respiratory infected, 38.7 (± 1.8) in controlled; t test was 4.003 and p<0.001.
- Premature birth mean value was 28 (± 5.1) in the RI group, 14 (± 3.2) in the control group. The t test was 22 and p<0.001.
- Mean value of birth weight (kg): 3.0 (± 0.4) in the RI group, 3.4 (± 0.5) in the controlled group; t test was 12.4 and p<0.001
- Caesarean Birth: Mean number 60 (± 5.6) in RI group, 46 (±3.8) in controlled, t test was 19.6 and p<0.001
- Employed mother mean number: 65 (± 9.2) in RI group, 43 (± 5.2) in controlled group, t test was 19.7 and p<0.001.
- One or more brothers: 70 (± 5) in the RI group, 48 (± 1.8) in the controlled group; the t test was 67.7 and p<0.001.
- Smoking, tobacco chewer mother: 18 (± 5.6) in RI group, 12 (± 3.3) in controlled group, t test 8.7 and p<0.001
- Smoking, tobacco chewer Father: 45 (± 4.6) in the RI group, 30 (± 1.6) in the controlled group, t test 29.2 and p<0.001

Table 2: Comparative study of breast feeding in patients with acute respiratory infection in a controlled group

- Patient with excessive breast feeding before onset of symptoms: 60 (± 3.6) in the RI group, 72 (± 5.2) in the controlled group; t test was 18 and p<0.001.
- Never breast-fed patients: 25 (± 3.3) in RI, 13 (± 2.6) in the controlled group; t test was 27 and p<0.001

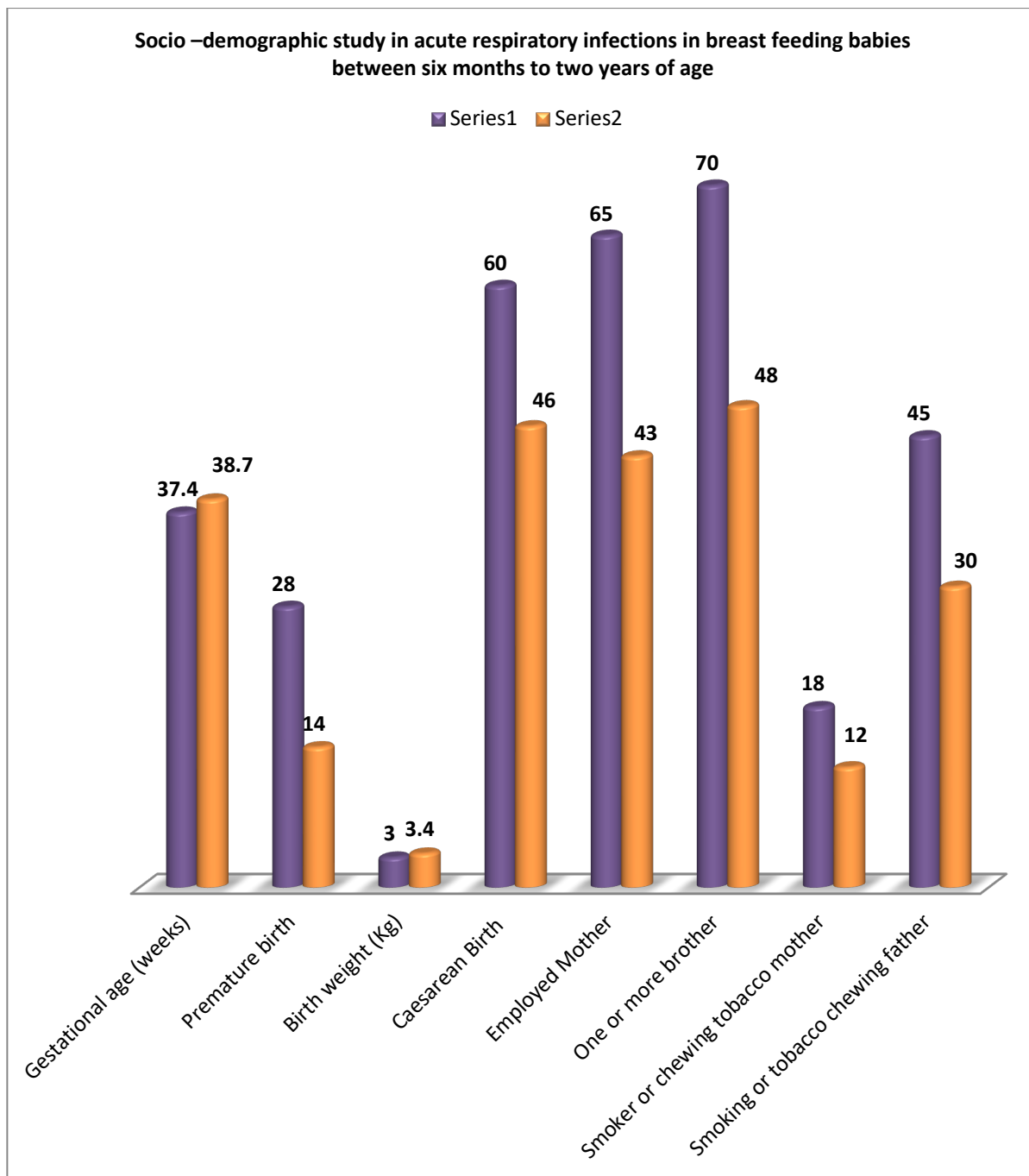


Figure 1: Socio-demographic study in acute respiratory infections in breast feeding babies between six months to two years of age

Table 2: Comparative study of breast feeding in patients with acute respiratory infection with controlled group

| Details | Respiratory infection (90) | Controlled group (90) | t test | p value |
|---|----------------------------|-----------------------|--------|---------|
| Patients with exclusive breast feeding before onset of symptoms | 60 (± 3.6) | 72 (± 5.2) | 18 | P<0.001 |
| Never breast fed patients | 25 (± 3.3) | 13 (± 2.6) | 27 | P<0.001 |

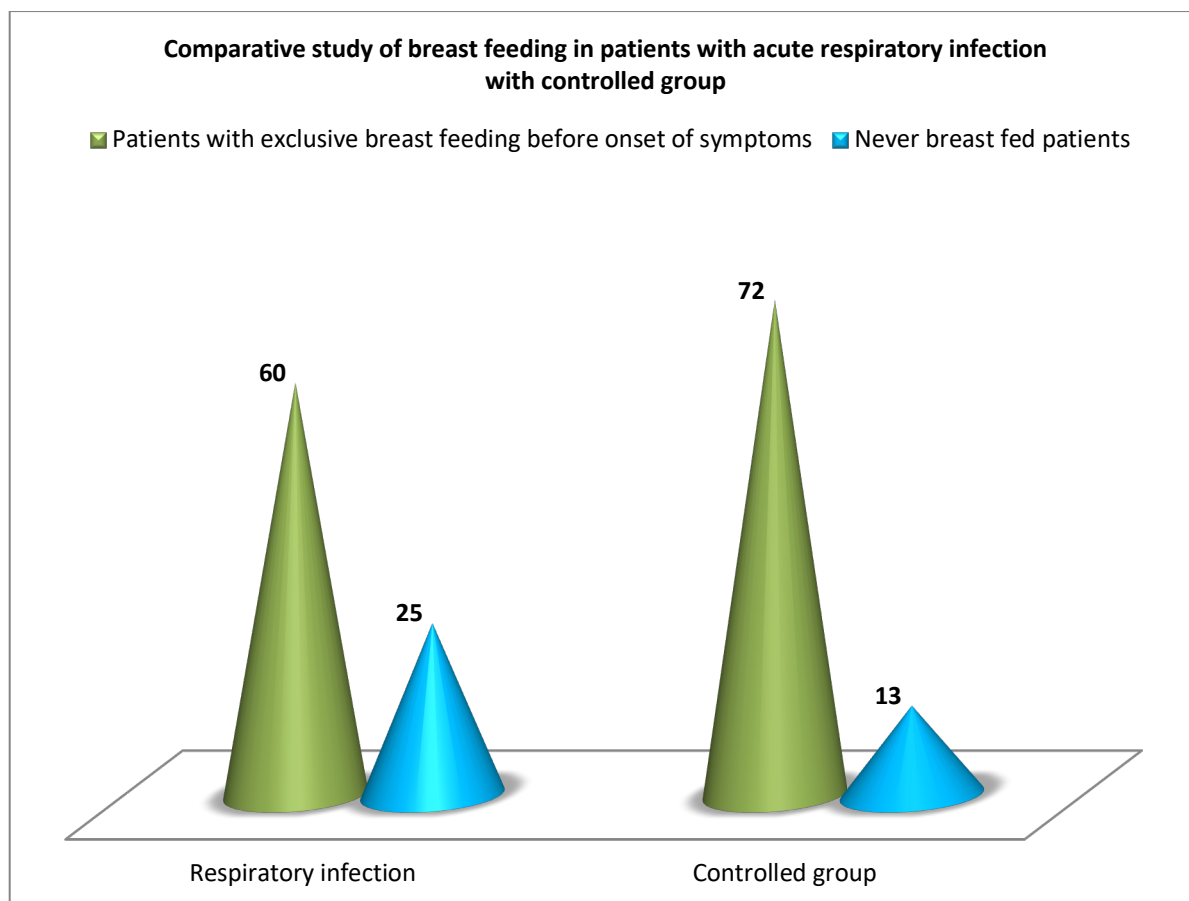


Figure 2: Comparative study of breast feeding in patients with acute respiratory infection with controlled group

Discussion

Present ARI in breast-feeding babies between six months to two years of age in the north Karnataka population. A socio demographic study was compared in ARI babies, and the controlled group included gestational age and premature birth. Mean value of birth weight, caesarean birth, Employed mother, siblings, smokers patients and had significant p value ($p < 0.001$). In the comparative study of breast feeding in patients with ARI patients with a controlled group, in patients with exclusive breast feeding before onset of symptoms, $60 (\pm 3.6)$ in ARI patients and $72 (\pm 5.2)$ in the controlled group, t test 18 and $p < 0.001$. In the never breast-fed patient study, $25 (\pm 3.3)$ ARI patients and $13 (\pm 2.6)$ were in the control group; the t test was 27 and $p < 0.001$ (the p value was highly significant). These findings are more or less in agreement with previous studies [5,6,7].

It is reported that breast feeding measures consistent with a biological phenomenon. Since maternal milk transmits both immune cells and antibodies to infants, immune modulation could explain the breast feeding effects that are noted to extend beyond the actual period of exposure [8]. It has been found that lymphocyte profiles differ in breast-fed babies and those who are not breast-fed.

T lymphocyte profiles differ in children who are prone to asthma in infancy from those who are not so predisposed [9]. It is also suggested that maternal smoking may account for apparent breast feeding effects because women who smoke are less likely to breastfeed, and children of smoking mothers or fathers have an increased risk of morbidity, mortality, and hospitalization for ARI [10].

Some studies have reported that breast feeding does not provide substantial protection against common infections and illnesses during the first year of life. Other studies concluded that a shorter period of breast feeding might increase the risk of acute respiratory diseases. It is also hypothesized that breast-fed babies are less susceptible to infections, including respiratory or viral diseases [11]. In addition to this, a healthy mother's milk feed plays a vital role in immunity for babies.

Inadequate breast feeding and inappropriate complementary food are the important causes of malnutrition in infants, which predisposes to micronutrient deficiencies, especially iron and zinc. Zinc deficiency is associated with growth retardation and increased rates of pneumonia and diarrhea in children.

Summary and Conclusion

In the present ARI in breast-feeding babies up to 2 years, it was observed that breast-fed babies by healthy mothers were less prone to infection and fewer babies were hospitalized. Hence, nutritional status during pregnancy and lactation also plays a vital role in helping the babies defend themselves from infections. This study demands social awareness regarding the importance of breast feeding to minimize the hospitalization of babies.

Limitation of study: Owing to a lack of advanced technology to rule out mother milk, limited patients, and the remote location of our hospital, we have limited findings and results.

This research paper was approved by the ethical committee of ESIC Medical College Kalaburgi, Karnataka-585106.

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