

# IMPACT AND RISK FACTORS OF LOW RESPIRATORY TRACK INFECTIONS IN CHILDREN

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## **Abstract**

Understanding the main risk factors can help develop preventive strategies with a geographical focus. The objective of the current observational study was to gather data on the factors of risk for severe lower respiratory infections (ALRI) in children under the age of five who were hospitalized in Mumbai, India. A transactional observational study for case-control was conducted at Dr. Agarwal's children hospital, Mumbai from September 2022 - November 2022 in 100 ALRI hospitalized below-5-year-old children along with 100 healthy newborns who were simultaneously picked from the immunization and well-baby clinics as controls. In this study, a hierarchy of the ALRI risk factors is made clear., immunization, improper breastfeeding and weaning techniques, poor living conditions and hunger, prematurity, and caesarean birth. The first year of life turns out to be the most susceptible time in this regard. The study's definition of risk variables, though it uses a different hierarchical pattern, is consistent with prior publications. Adequate prenatal and vaccination care, good nutrition and breastfeeding support, limiting crowding, and avoiding infection from contacts with family members emerged as major preventative concepts. In a particular geographical context, efficient health education and accessibility to fundamental child and maternal health services, particularly for preterm and young infants, appeared to be necessary preventive measures against ALRI in preschool infants.

***Keywords: Acute lower respiratory infection, Age under 5, Impacts, Risk factors***

## **Introduction**

In under-developed countries, acute lower respiratory infections (ALRIs) are the main cause of hospitalization and mortality among the children below 5. The prevalence of ALRI is also high in the developed world, although death and more acute disease are disproportionately high in underdeveloped nations. A number of variables, including low birth weight, the timing of the breast-feeding initiation, weaning along complementary foods, vaccination status, etc., have been demonstrated to affect the ALRI risk in children below the age of five (Simoes et al., 2019).

Understanding the risks might aid in preventing disease through appropriate health promotion programmes and various interference community projects for development. The development of a local proof base must direct actions to monitor risk factors in order to give power to the management by preventing severe forms of disease as well as improving victim outcomes (Dangor et al., 2021). The current observational study for case-control is based on hospitalized ALRI children under the age of five and healthy controls in central India. It makes an effort to rank and rank the importance of the numerous known determinants that affect the prevalence of ALRI in a given a regional context and also to consider evidence-based preventive measures.

### **Materials and Methods**

Children diagnosed with ALRI under the age of five who were admitted at Dr. Agarwal children hospital, Mumbai between September 2022 - November 2022 were included as study participants. As controls, healthy kids who regularly attended the hospital's immunization along with the well-baby clinic and were matched for the age and gender were chosen. Prior to enrollment in this purely observed cross-sectional study for case-control, parents were notified that data on their children's general health will be utilized for research without any reassessment. The departmental research committee gave its approval to the study protocol. ALRI was described as the existence of a cough and rapid breathing of about more than a 60 beats/minute in infants below 2 months of age, more than a 50 beats/minute for infants of 2-12 months, and more than 40 beats/minute for children 1 to 5 years. 3 Healthy infants without any respiratory or other issues served as the controls.

A thorough health history and pertinent epidemiological data were obtained from mothers in both the cases and the controls. An inspection of the body was done. The goal of the physical examination and history was to identify any relevant risk factors. Information about any family members who smoke, the number of people who share the baby's room, the record of respiratory infections in a member of family over the previous two weeks, and other details were gathered. 100 healthy contemporaneous controls who were around the same age and gender as the 100 ALRI cases were included for the study. Potential risk variables were compared and assessed between the two comparable groups. Working hierarchies of the risk factors were created based on statistical significance levels and the size of differences shown by an odds ratio.

### **Results and Discussions**

The emphasis of the study is the comparative prevalence of epidemiological factors among patients and controls. Table 1 shows maternal and family influences. The moms in the two groups did not significantly differ in terms of age or educational background. In comparison to the control group, a disproportionately greater proportion of case group moms worked outside, and the

prevalence of smokers in families was also higher. Even more significant was the case group's greater proportion of family members who had respiratory infections in the previous two weeks. Additionally, sharing a child's room with more than two family members was substantially more common in the case group. Maternal variables also showed a notably high percentage of case group patients who were born third or later. Regarding the time since the previous birth, there was no difference between the two groups.

**Table 1 Maternal and Familial factors of ALRI controls and cases**

<b>Familial factors</b>		<b>ALRI</b>	<b>Controls</b>	<b>P</b>
Age of Mother	<25 years	56	42	
	>25 years	46	58	
Education	up to middle school	49	36	
	Higher than middle school	53	64	
Employment status	Yes	17	7*	(0.461)
	No	83	93	
No. of smokers in family	Yes	30	20*	(0.05)
	No	70	82	
Respiratory Infection	Yes	41	26**	(0.0177)
	No	59	74	
Members of family sharing the room of babies	<2	40	58**	(0.0108)
	>2	60	44	
<b>Maternal factors</b>				
Pregnancy order	<2	74	88*	(0.0306)
	>2	24	12	
Birth interval	<24months	60	50	

	>24months	39	53
Labour Term	<37week	16	6*(0.0297)
	>37weeks	82	94
Labour Type	Vaginal	74	91*(0.0009)
	Cesarian	28	9

P \*= $<0.05$ ; \*\*= $<0.01$

**Table 2 Possible risk factors - ALRI**

Risk factor	Stat. importance of difference	Odds ratio
Birth weight at birth <2500g	*****	3.64
Immunization Incomplete	***	5.53
Breast feeding (less than 4 months)	***	2.96
Hemoglobin Level	***	2.58
Breast feeding Initiation	**	2.86
Space availabilty in home (more than 2 persons)	**	2.08
Complementary food >6months	**	2.06
Respiratory infection running through family	**	2.03
C – section birth	*	8.75
Preterm birth	*	2.73
Mother working out	*	2.54
Low weight	*	2.43
Pregnancy order	*	2.24

No.of Somkers /Family	*	1.93
<25 age mother	NS	1.70
Non-educated mother<high school	NS	1.65
Recurrent birth without intervals <24months	NS	1.57

The operating hierarchy of the ALRI risk factors with regional importance is attempted to be depict in Table 2, considering the statistical significance of changes in risk factor prevalence between controls and cases along with the degrees as reflected by odds ratios. Appropriate pregnancy and prenatal immunization care, nutrition care and good breastfeeding for infants, minimizing overcrowding in baby rooms, and avoiding infection sources in families are all feasible as strategies of key significance to lower the incidence of ALRI for below 5 age group in that region.

The goal was to develop clinical evidence on the factors that influence risk of ALRI in children below 5 at the regional level. In order to do this, 100 hospitalized children with ALRI cases along with equal number of healthy, sex and age-matched children group were chosen from immunization as well as well-baby clinics. Mother interviews and physical examinations were used to gather information on demographic, biological and environmental factors. It is anticipated that moms who are older and more educated will provide better care for their early children, improving their overall health. Although the variation is not statistically important, the proportion of mothers who are under 25 and have low levels of education was about 10% higher in cases than in controls. The mother's outdoor job is anticipated to degrade the standard of child care. Working moms made up much more of the case group's population compared to the controls, which is consistent with other research' findings that this is the ALRI risk factor (Nair et al., 2013; Alkema et al., 2014; Sonogo et al., 2015).

In the past two weeks, there was a noticeably higher incidence of respiratory infections amongst family members among cases, which might possibly be a source of contamination and is thus recognized as a risk factor. In contrast to controls, higher significance was observed in situations when more than two family members occupied a single room, and overcrowding is a known ALRI risk factor (Wonodi et al., 2012; Mertz et al., 2013). Previous pregnancies have a detrimental effect on the health of mother and baby. Late birth order, a recognized risk factor, was present in a considerably high proportion of ALRI cases (National Academies of Sciences et al., 2020). While shorter birth intervals were more frequently seen among patients, there was no statistically remarkable difference between them and the control group. The risk of ALRI is same for shorter birth intervals and for late birth order. Premature deliveries < gestation of 37 weeks was more common among the patients and are known to enhance the vulnerability of infection on

numerous grounds (Admon et al., 2019). It was intentional to choose controls with an even distribution of sex and ages.

This prevented material disparities about the same. But among the cases, there were 64 times more male newborns than female births (Savitha et al., 2007). In the current study, around 81 of the 100 cases were under one year old, making it clear that these individuals were more exposed to viruses that cause ALRI and that most of them were men. Several other papers also claim that males predominate in ALRI. Therefore, delayed breast-feeding initiation emerged as a substantial risk factor. Contrasting with the controls, the proportion of patients who did not receive at least four months of exclusive breastfeeding was considerably higher by twice as much. With understanding of the risk factors for ALRI in children under the age of five, the data obtained by the current analysis is broadly consistent (Selvaraj et al., 2014; Krishnan et al., 2019). The measurable contribution of the risk factors, however, clearly distinguishes this study from prior studies. Contrary to previous publications, lower weight for a particular age was substantially lower in the risk factor hierarchy; however, this conclusion may be explained by reference controls' profiles, which were less diverse than those of the study participants. A decreased risk was posed by mothers who worked outside and by family members who smoke. Probably better at handling them are families. The group under examination was not significantly affected by previous risk factors mentioned in prior studies.

## Conclusions

As indicated by the report's results, efficient health education and availability to immunization and antenatal care, appropriate infant nutrition practises, and exclusive care for the immature babies, especially in the first year arise as valuable initiatives to lower the ALRI risk in children and infants below 5 years of age in north India.

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