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PREVALENCE OF ACUTE RESPIRATORY INFECTIONS (ARI) IN UNDER FIVE CHILDREN IN RURAL AREA

Community Medicine

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ABSTRACT

In India, Acute Respiratory Infections (ARI) contributes to 15-30% of all under five deaths. To prevent these deaths, understanding of the factors associated with ARI in under five children is necessary like, low birth weight, immunization, etc. Hence, the present study was planned, to estimate the magnitude of ARI and to study factors like low birth weight and immunization related to ARI in under five children in rural area. **Aim and Objectives:** 1.To estimate the prevalence of acute respiratory infections (ARI) amongst under five children in rural area. 2.To study relation of Birth weight and Immunization status with ARI. **Methodology:** Presence of ARI was ascertained by asking the guardian about the presence of cough or cold in under five children in last 2 weeks preceding the visit. Those having ARI at the time of visit were examined and classified according to the IMNCI classification for ARI. Information regarding birth weight and Immunization status was ascertained from guardian and immunization card, respectively. **Observations:** The prevalence of ARI in under five children of rural area was 45.88% with maximum i.e. 149 (84.18%) under five children had No pneumonia: cough or cold. Prevalence of ARI was more with low birth weight (64.24%) and with immunization not appropriate for age (75.16%). **Conclusion:** Prevalence of ARI in under five children in rural area was 45.88% with low birth weight and immunization not appropriate for age being significantly related with it.

KEYWORDS

Acute Respiratory Infections (ARI), Under Five Children, Birth Weight, Immunization Appropriate for Age.

INTRODUCTION

Children are the future of country. Acute Respiratory Infection (ARI) is the substantial cause of morbidity and mortality in young children, and it is a major public health problem in both developed and developing countries. Most acute respiratory infections result in mild illnesses, such as the common cold. But in vulnerable children, infections that begin with mild symptoms may sometimes lead to more severe illnesses, such as pneumonia.[1] ARI is responsible for about 30-50% visits to health facilities and for about 20-40% admissions to hospital.[2] In India, ARI contributes to 15-30% of all under five deaths and most of these deaths are preventable.[3]

To prevent these deaths, a complete understanding of the factors associated with ARI in under five children is necessary. A multiple of social and environmental factors are associated with ARI morbidity and mortality in childhood like, low birth weight, immunization, etc.

However, few studies are available, where these factors were studied in under five children of rural area for which the present study was planned, to estimate the magnitude of ARI and study epidemiological factors like low birth weight and immunization related to ARI in under five children in rural area.

AIM AND OBJECTIVES

1. To estimate the prevalence of acute respiratory infections (ARI) amongst under five children in rural area.
2. To study relation of Birth weight and Immunization status with ARI.

MATERIAL AND METHODS

Present observational descriptive cross-sectional study was conducted in five villages of Kalimati Sub-center under Primary Health Center Kalimati of Gondia District, Maharashtra State, India. Data was collected from Nov 2013 to Jan 2014.

Sample size was calculated using reference of study conducted by Dr. Bipin Prajapati[4] in 2011, in Ahemadabad district of Gujarat, India where prevalence of ARI in under five children of rural area was found to be 26.8%. So, considering this prevalence with 15% relative precision and 95% confidence interval, sample size was estimated to be 481. Approval from Institutional Ethics Committee was obtained. Sub-center was selected by multi stage random sampling method in administrative area of Nagpur Division of Maharashtra State, India. Selected sub centre had five villages with overall population of 4948 and had 489 under five children of which 3 childrens were not available during Data collection even after three informed visit so excluded and final study was done with 486 under five children.

Presence of ARI was ascertained by asking the guardian (mostly mother of under five children) about the presence of cough or cold in under five children in last 2 weeks preceding the visit. Those under five children who had ARI at the time of visit were examined and classified into: a) No pneumonia: cough or cold, b) Pneumonia, c) Severe pneumonia and d) Very severe disease, according to the Integrated Management of Neonatal and Childhood Illness (IMNCI)[5] classification for ARI. Information regarding birth weight is obtained from Guardian of child. Immunization status was ascertained from immunization card and consider age appropriate immunization according to Universal Immunization Programme of India.

Under five children were clinically examined for respiratory rate, presence of chest indrawing, nasal flare, grunting, cyanosis, convulsions, abnormally sleepiness or difficulty in waking up and presence of stridor. Data was entered in Microsoft excel sheet and analyzed using Epi Info TM-7 software.

OBSERVATIONS

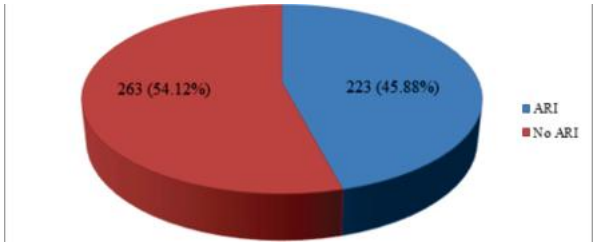

Fig 1. Prevalence of ARI in Under Five Children (n = 486)

Fig.1 shows the prevalence of ARI in under five children. Out of 486 under five children in study, 223 (45.88%) had suffered from ARI in last 2 weeks preceding the survey. The prevalence of Acute Respiratory Infections (ARI) in under five children of rural area was 45.88%.

Table 1- Distribution of ARI Cases According to IMNCI Classification

Classification of ARI	Study subjects (*n=177)	
	Number	Percentage
No pneumonia: cough or cold	149	84.18
Pneumonia	25	14.12
Severe pneumonia	02	1.13
Very severe disease	01	0.56

* 177 study subjects had ARI at the time of visit

Table 1 shows out of 223 ARI cases, 177 had ARI at the time of visit and they were classified according to IMNCI classification. It was

found that, maximum i.e. 149 (84.18%) had No pneumonia: cough or cold, followed by Pneumonia in 25 (14.12%) and Severe pneumonia in 2 (1.13%) children. However, 1 (0.56%) child had Very severe disease.

Table 2- Prevalence of ARI by Birth Weight

*Birth weight	Number of Subjects	Subjects with ARI	
		Number	Percentage
Normal	319	116	36.36
Low birth weight	165	106	64.24
Very low birth weight	02	01	50.00
Total	486	223	45.88

*Normal birth weight: > 2500 gms
Low birth weight: 1500-2499 gms
Very low birth weight: 1000-1499 gms
Extremely low birth weight: < 1000 gms
Chi square = 33.89, df = 1, P < 0.001. (Normal vs. low & very low birth weight)

Table 2 shows prevalence of ARI was more when under five children had low birth weight (64.24%), followed by very low birth weight (50.00%). The prevalence was less (36.36%) when under five children had normal birth weight. When children with normal birth weight were compared with children with low birth weight (low birth weight and very low birth weight), it was found that the prevalence of ARI was significantly more in under five children with low birth weight (chi square = 33.89, df = 1, p < 0.001).

Table 3- Prevalence of ARI by Immunization Status

Immunization status	Number of Subjects	Subjects with ARI	
		Number	Percentage
Immunization appropriate for Age	328	105	32.01
Immunization not appropriate for Age	153	115	75.16
*Immunization status not known	05	03	60.00
Total	486	223	45.88

* There was no documentary evidence of immunization status of 5 study subjects.

Chi square = 78.27, df = 1, P < 0.001. (immunization appropriate for age vs. immunization not appropriate for age)

Table 3 shows, amongst under five children who were immunized not appropriate for age, prevalence of ARI was more (75.16%) than those who were immunized appropriate for age (32.01%). Immunization not appropriate for age was highly significantly related with occurrence of ARI in under five children (chi square = 78.27, df = 1, p < 0.001).

DISCUSSION

In present study, we found the prevalence of ARI in under five children of rural area to be 45.88%. Studies conducted by Azad KA (2009)[6], Giri VC et al (2008)[7], Mayappanavar et al (2010)[8], Prajapati B et al (2011)[4], Mir AA et al (2012)[9] and Sharma D et al (2013)[10] found prevalence of ARI to be varying from 21.30 % to 33.6%. Studies by Chhabra P et al (1993)[11], Tambe MP et al (1999)[12] and Sudharsanam MB (2006)[13] found low prevalence of ARI, varying between 5.6% to 12.1%.

In present study, we found prevalence of ARI was more (64.07%) in under five children with low birth weight as compared to children of normal birth weight (36.36%) and low birth weight significantly increased the risk by 3 times of acquiring ARI in them (OR = 3.12, 95% CI 2.11 – 4.60, p < 0.001). Similar findings were seen in study conducted by Sharma D et al (2013)[10] where low birth weight increased the risk of ARI by 9 times. Similarly, Ramesh K et al (2012)[14] had found double risk of severe pneumonia in low birth weight under five children.

The prevalence of ARI was more (75.16%) in children who had immunization not appropriate for age, which was less when children were immunized appropriate for age (32.01%). Immunization inappropriate for age, increased the risk of ARI in under five children by 6 times (OR = 6.43, 95% CI 4.16 – 9.91, p < 0.001). Similar findings were noted by Broor S et al (2001)[15], Savitha M R et al (2007)[16], Pore P et al (2010)[17], Mayappanavar et al (2010)[8], Mir AA et al (2012)[9], and Sharma D et al (2013)[10] in their studies.

However, Sikolia DN et al (2002)[18] and Verhagen LM et al (2012)[19] did not found any significant relation of immunization status with ARI occurrence in under five children. The cause for this unlike finding was that in rural area of Kenya, where Sikolia DN et al[18] conducted study, children who were fully immunized were in more numbers (71.42%) and in study conducted by Verhagen LM et al[19] in Venezuela, the proportion of fully immunized children was very less (27%), So, in both these studies immunization could not be properly studied for ARI occurrence in children.

Age appropriate immunization boost the immunity of children against infectious diseases, hence those children who did not receive immunization appropriate for age becomes susceptible for infectious diseases including respiratory infections.

CONCLUSION

In present study, the prevalence of acute respiratory infections (ARI) in under five children in rural area was 45.88%. Low birth weight, immunization not appropriate for age, were significantly related with occurrence of ARI in under five children in rural area.

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