Original Article

STUDY OF RISK FACTORS OF ACUTE RESPIRATORY INFECTION (ARI) IN UNDERFIVES IN SOLAPUR

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ABSTRACT

Background: - Acute Respiratory Infection (ARI) is an important cause of mortality and morbidity in children especially in underfives. In India it constitutes 19% of underfive deaths and 8.2 % of all disability in underfives. Various risk factors make these children prone for ARI. The high mortality & morbidity made necessary to know the risk factors of ARI. **Objective:** To study some of the risk factors responsible for occurrence of ARI in underfives. **Methods:** A case-control study was undertaken during 2000-2001 in Solapur to study some risk factors of ARI in underfives. The cases were ARI patients from Solapur City admitted in pediatric ward of S.C.S.M. General Hospital, Solapur while the same number of controls were selected from neighborhood and were matched for age, sex and religion. **Results:** A significant association was found between ARI and nutritional status, immunization status, weaning, mothers' literacy status. The literacy status of father didn't show any association with ARI of their kids. A premature child had around 7.5 times risk of developing ARI.

Key words: - ARI, Risk factors, Underfives, Pneumonia

INTRODUCTION

India has a huge population of children. The under-5s constitutes about 11% of population, a larger number than the population of some countries. [1] Acute Respiratory Infection (A.R.I.) is an acute infection of any part of the respiratory tract and related structures including paranasal sinuses, middle ear and pleural cavity. It includes all infections of less than 30 days duration except those of the middle ear where the duration of an acute episode is less than 14 days. A.R.I. may cause inflammation of respiratory tract anywhere from nose to alveoli with a wide range of combination of symptoms & signs.

Every year A.R.I. in young children is responsible for an estimated 3.9 million deaths worldwide. It is estimated that Bangladesh, India, Indonesia & Nepal together account for 40% of global A.R.I. mortality [1]. A.R.I. causes 19% of all deaths in children below 5 years and 8.2% of all disability & premature mortality [2]. Although most of the attacks are mild and self limiting episodes, ARI is responsible for about 30 – 50 % visits to health facilities and for about 20- 40 % admissions to hospital. The DALYs lost due to ARI in South East Asia Region are about 3,30,26,000. Thus ARI is the leading cause of mortality and morbidity in India especially in under-5s.

Various factors are quoted as a risk factors for A.R.I. like malnutrition, low birth weight, immunization, overcrowding, ill-ventilation, indoor smoke etc.[1]

A case –control study in the light of above consideration was conducted in Solapur to study some of the risk factors responsible for the occurrence of A.R.I. in under five.

OBJECTIVE

To study some of the risk factors responsible for the occurrence of A.R.I. in underfive.

MATERIALS & METHODS

A case-control study was conducted in Solapur City to study some of the risk factors responsible for the occurrence of A.R.I. in under five.

Selection of cases: Cases were admitted patients of ARI in Pediatric Ward of S.C.S.M. General Hospital, Solapur. There were total 232 under fives admitted in ward over a period of one year. Out of these 232 cases all patients residing in Solapur Municipal Corporation area were selected as cases. There were such 80 patients who fulfill inclusion criteria. These patients were examined and detailed history collected. Their homes were traced and necessary information was collected in pre-designed and pre-tested proforma.

Selection of controls: One is to one control was selected from neighborhood of the each case.

These controls were matched for sex, age (more than 2 months age for case – 1 month on either side for control & less than 2 months age for case – 15 days on either side for control) and religion. These controls were not suffering from similar illness (A.R.I.) at the time of interview. After locating child's home, information was collected in a pre-tested & pre-designed same proforma, which was used for obtaining a history from cases.

Recording of height, weight and grading of nutritional status: Height was measured in nearest centimeter by drawing a metric scale on the wall and in case of small children by standard measuring tape.

Weight was measured in nearest 100 grams with the help of standardized weighing machine. The machine was standardized from time to time with the help of standard weight. Before taking weight zero was adjusted properly. The approximate expected weight of child was calculated by using a formula given in (Table no. 10.1) Nelson Textbook of Pediatrics[3]

had illiterate mother and 56 (70%) had literate mother among controls.

When father's literacy was considered 21 (26.25%) had illiterate father and 59 (73.75%) had literate father among the cases and 18 (22.5%) had illiterate father & 62 (77.5%) had literate father among the controls.

Table 2: Distribution of cases and controls according to various risk factors

Risk Factor	Cases	Controls	Total	χ2	P value	OR (CI)
Nutritional status						
Undernourished	70	46	116	19.02	0.00002	5.17
Normal	10	34	44			(2.42-11.04)
Immunization						
Not Fully Immunized	57	39	96	8.44	0.003	2.60
Fully Immunized	23	41	64			(1.36-4.97)
* Weaning started at						
Inappropriate age	29	11	40	11.24	0.0006	3.88
Appropriate age	38	56	94			(1.77-8.49)
Mothers' Literacy						
Illiterate	43	24	67	9.27	0.002	2.71
Literate	37	56	93			(1.42-5.15)
Fathers' Literacy						
Illiterate	21	18	39	0.30	0.58	-
Literate	59	62	121			
Maturity status						
Premature	7	1	8	-	-	7.57
Mature	73	79	152			(0.9-63.07)

* Those below the age of 4 months were not included.

Among 80 cases only 7 (8.75%) were premature and 73 (91.25%) were full term mature while among the 80 controls only 1 (1.25%) was premature and 79 (98.75%) were full term mature.

DISCUSSION

Out of the total 160 children only 44 (27.50%) had normal nutritional status. The number was more in controls as compared to cases. Malnutrition and infection goes hand in hand. Infection leads to malnutrition and malnourished children are more prone for various infections. The same thing proved in these cases. The present study found a significant association between ARI and nutritional status (P<0.001) with odds ratio 5.17 indicating 5.17 times more risk of ARI for poorly nourished children as compared to normally nourished. Various studies like by Cesar G. Victora, Sandra C Fuchs et al (1994) [7]; Shah N., Ramanjutty V. et al (1994) [8]; W Fonseca, B. R. Kirkwood et al (1996) [9]; Rahman M M, Rahman A M et al (1997) [10] found similar association.

The fully immunized children are very few (28.75%) in cases. The child when fully immunized is protected against various respiratory infections like diphtheria, pertussis and also complications of measles. As these children are not fully immunized they are at risk of development of these infections. A significant association was found between ARI and immunization (P<0.005) in present study which is also quoted by Dr. Deepak Bhakve (1991) [11]; Shah N, Ramanjutty V et al (1994) [8]; W Fonseca, B R Kirkwood (1996) [9]. The odds ratio is 2.60 reveling 2.6 times more risk of ARI for not fully immunized or not immunized as compared to fully immunized.

The present study found a significant association between weaning status and ARI (P<0.05). Odds ratio 3.88 reveled 3.88 times risk of ARI if weaning was not started at right time. Shah N, Ramanjutty V et al (1994) [8]; in his study also reveled delayed weaning as a probable risk factor for ARI. As weaning is delayed or not started at right time there are chances of development of malnutrition which is a very important risk factor for ARI.

A significant association was found between ARI and maternal literacy status (P<0.01) but not with

father's literacy status (P>0.05).Deepak Bhakve (1991)[11] found ARI more common in children of illiterate mother and Cesar G Victora, Sandra C Fuchs et al (1994)[7] reveled risk of pneumonia declined with education of mother and father. B N S Walia, S K Gambhir et al (1988) [12] reveled parental educations did not show any relation with ARI episodes. Usually father remains outside for work most of the times but mother is in the home looking after children and household activities. Mother and child are considered as one unit. Mother due to her close association with child recognizes even the minor changes in child's health than father. She is usually more cared for her child's health. Because of such factors mother's literacy status might play a role in child's health and disease than father's literacy status.

Odds ratio 7.57 revealed nearly 7.5 times more risk of developing A.R.I. among premature as compared to full term mature respondents. The premature children are underweight; also their immune system is not well developed so these children are more prone for various infections like respiratory infections.

Thus present study found nutritional status, immunization status, delayed weaning, mother's literacy, and prematurity as significant risk factors for Acute Respiratory Infections (ARI) in underfives.

REFERENCES

1. K. Park: Park's Textbook of Preventive and Social Medicine 19th edition, Banarsidas Bhanot Publishers, Jabalpur: February 2007: 382, 142

2. Acute Respiratory Infections: ICMR Bulletin, September 2000, 87 – 88

3. Nelson Textbook of Pediatrics, W.B. Saunders Company 16th edition, 2000, 32, 59.

4. I.A.P. Textbook of Pediatrics for undergraduate students Jaypee Brothers New Delhi, 1999, 81.

5. Nutrition in Preventive Medicine, W.H.O. Monograph, Series No. 62, 1976, 535.

6. Kuppuswami B.: Manual of Socioeconomic Scale (Urban) Manasayan, 32, Netaji Subhash Marg, New Delhi – 6, 1981.

7. Cesar G. Victora, Sandra C. Fuchs et al: Risk Factors for Pneumonia Among Children in a Brazilian Metropolitan Area, Pediatrics, volume 93, No. 6, June 1994, 977 – 985.

8. Shah N. Ramanjutty V. et al: Risk factors for severe pneumonia in children in South Kerala, a hospital based case control study, Journal of Tropical Pediatrics, 40 (4), August 1994, 201 - 206.

9. W. Fonseca, B.R. Kirkwood et al: Risk factors for childhood pneumonia among the urban poor in Fortaleza, Brazil: a case control study, Bulletin of The World Health Organization, 74 (2), 1996, 199 -208.

10. Rahman M.M., Rahman A.M.: Prevalence of acute respiratory tract infection and its risk factors in under-five children, Bangladesh Medical Research Council Bulletin, 23 (2) August 1997, 47 -50.

11. Dr. Deepak Bhakave: Epidemiological Study of Acute Respiratory Infections in Under Six Children in urban ICDS Block: A Dissertation for M.D. (P. & S.M.), May 1991.

12. B.N.S. Walia S.K. Gambhir et al: Socio-economic and ecologic correlates of acute respiratory infections in pre-school children, Indian Pediatrics, volume 25, July 1988, 607 – 612.