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Original Research Article

Study of incidence of upper respiratory tract infections in urban and rural population

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Abstract: Acute respiratory tract infection (ARI) is responsible for considerable morbidity and mortality especially in fewer than five children in all over the world. World Health Organization in 1990 estimated that ARI constituted the most common causes of death in fewer than five children, being responsible for 4.3 million of 12.9 million deaths worldwide. This study was undertaken to study the incidence of upper respiratory tract infections in urban and rural population.This cross-sectional study was done including of rural and urban population. The participants were of all ages ranging from 1 year to 69 years. All patients having upper respiratory tract infections were taken for the study. Also patients which had respiratory tract infections and having their records were considered for the study. Detail case history was recorded of all patients. A total of 3498 individuals were checked for this particular study. Out of these, 287 (8.2%) were found to had upper respiratory tract infections. There is need for strengthening of information education activity in other programmes, raising female literacy level, to help in prevention and control of RTI. Proper training of health workers regarding identification, management and timely referral cases of RTI are essential.
KeywordsUpper respiratory tract infections, General population, Urban and rural population

INTRODUCTION:

Respiratory tract infections (RTI) are a persistent and pervasive public health problem in both developed and developing countries. They cause a great burden of disease worldwide. Especially in developing countries INDIA, RTIs, mainly pneumonia, are the leading cause of death among children under the age of 5 years. A great variety of pathogens can cause RTIs, and viruses have been considered as the predominant pathogens in this children population. The most frequently reported viruses include respiratory syncytial virus (RSV), influenza viruses A and B (IAV, IBV), Para influenza viruses (PIVs), human rhinovirus (HRV) and adenovirus (ADV), which are responsible for most episodes of RTIs in children.1 In the past decade, several new viruses associated with RTIs such as human metapneumo virus (HMPV), novel strains of coronaviruses (SARS-CoV, HCoV-NL63 and HKUI), human Boca virus (BOV), WU polyoma virus (WUPoyV) and KI polyomavirus (KIPoyV) have been discovered in human respiratory tract specimens. Among them, some have been identified to be causative pathogens of RTIs [1-3].

Children with recurrent illnesses are of great concern for parents and influence their family interactions. When children are ill, daily routines are changed and the parent usually adjusts to the need of the child. When the child suffers from recurrent infections, daily routines and family functioning can be disturbed for long periods of time [4].

Acute respiratory tract infection is a major cause of morbidity and mortality in developing and also developed countries. RTI is an infection of any part of respiratory tract or any related structures including para nasal sinuses, middle ear and pleural cavity. It includes, a new episode means occurring in an individual who has been free of symptoms for at least 48 hours and also all infections of less than 30 days duration except those of the middle ear where the duration of acute episode is less than 14 days. In the developing countries out of ten, seven deaths in fewer than 5 children are due to RTI [5, 6].

MATERIALS AND METHODS:

This cross-sectional study was done including of rural and urban population of Nasik, Ghoti and

Igatpuri (district- Nasik, Maharashtra, India). The participants were of all ages ranging from 1 year to 69 years. All patients having upper respiratory tract infections were taken for the study. Also patients which had respiratory tract infections and having their records were considered for the study. Detail case history was recorded of all patients. Approval of the ethical committee was obtained before start of the study. Informed consent was taken from all patients. The data was collected and analyzed using IBM SPSS statistics version 20 using student's t test.

RESULTS:

A total of 3498 individuals were checked for this particular study. Out of these, 287 (8.2%) were found to had upper respiratory tract infections. The children were found to be involved more commonly than that of the adult patients, especially children below 5 years of age (209 patients, 72.82%). The rural population was found to be more affected than urban population and the difference was found to be statistically significant. (Student's t test, $p<0.001$) (Table 1)

Table 1: Comparison of the number of patients affected in rural and urban population

Population	Number of patients (N)	Mean ± SD	T value	P value
Rural	168	0.11 ± 0.012	5.3424	<0.001*
Urban	119	0.054 ± 0.015		

SD= Standard deviation

*p<0.001= statistically highly significant

DISCUSSION:

Upper respiratory tract infections are the most common group of illnesses in young children. In the preschool child the recorded incidence approximates one medical consultation per annum, although obviously many other episodes are treated without medical referral, and their frequency has been shown to be related to seasonal factors, family size, and age and school attendances. Field studies of the effects of humidity on respiratory disease have taken place in schools and offices, and some reports have suggested that higher humidity was associated with occurrence of upper respiratory tract infection, but the findings have not always been consistent [7-9].

There have been fewer studies of the physical properties of domestic indoor air, but the common cold and respiratory illness have been associated with relative humidity or damp housing conditions. It is obvious that in this area of study environmental and behavioral factors are strongly interrelated, and in field studies variables are difficult if not impossible to isolate, therefore results must be regarded as suggestive rather than conclusive [10-12].

The normal variation of upper respiratory tract infections (including common cold) in toddlers consists of 6 - 8 periods a year. When a mean is taken of 7 - 10 days for every infectious period, up to 6 days a month seems a reasonable period to have an infection. According to the data, this number could be observed in the control group. A more recent study in Germany showed a lower frequency of common colds. This study with diaries revealed a mean duration of a common cold episode between 9 and 15 days in children aged 0 - 4 years. These children had a mean cumulative time of common cold of about 4 weeks a year concentrated in the winter period. The study of Gruber also described children with recurrent common cold episodes (>8 episodes a year), their cumulative time of common cold episodes exceeds the 4 weeks [4, 13, 14, 15].

RTI may be classified into Upper (URTI) and Lower Acute Respiratory Infection (LRTI), depending on the main organ affected, (nose, sinuses, middle ear, and larynx, pharynx, versus trachea, bronchus, and lungs). URTI are generally mild in nature and most often caused by virus, sometimes there is bacterial component. The overwhelming majority of RTI deaths are due to LRTI, consisting mainly pneumonia (70%). Nearly all severe LRTI episodes occur in fewer than five children, the elderly and immunocompromised individuals. Globally, about 4.2 million LRTI deaths are estimated to occur among all age group, of these 1.8 million are estimated to occur among child 1-59 months. Of the pneumonia 60% are caused by bacteria, mainly Streptococcus pneumonia and Hemophyllus influenza –B. RTI are among the leading cause of death in under five child but prevention, treatment and especially diagnosis and attribution are difficult and uncertain, because community studies of children mortality depend largely on verbal autopsies, where knowledge, attitude and practice of mothers are important. In rural areas, lack of basic health service, lack of awareness, and other associated factors like overcrowding, environmental factors, poverty, indoor air pollution are responsible factors [16-19].

It is common knowledge that the incidence of URTIs such as common cold and influenza exhibits seasonal fluctuations. In the more northerly and southerly parts of the hemispheres there is a peak in respiratory illness during the winter months. Winter seasonality has been reported for a wide range of

URTIs caused by 200 different viruses belonging to six families: orthomyxo viruses (influenza), paramyxo viruses (respiratory syncytial virus), Para influenza, coronaviruses, picorna viruses (common cold), herpes viruses and adenoviruses. Viruses which may cause systemic illness but which gain entrance to the body via the upper respiratory tract, such as certain paramyxo virus infections (measles, mumps) and varicella-zoster infection (chickenpox), also show similar winter seasonality. Lower respiratory tract diseases such as pneumonia, which may be of viral or bacterial etiology, also show a similar seasonal pattern, with the peak of illness in winter [20].

The nasal airway is subject to a temperature gradient during inspiration, with the anterior part of the nose being the coldest part of the airway. Thermal mapping studies of the airways in humans have demonstrated that in the course of conditioning the inspired air, the airways undergo thermal changes that extend well into the periphery of the lung[20].

Upper respiratory tract infection (URTI) or "the common cold" is a symptom complex usually caused by several families of virus; these are the rhinovirus, coronavirus, Para influenza, respiratory syncytial virus (RSV), adenovirus, human metapneumo virus and influenza. Occasionally the enterovirus is implicated in summer. Recently, the newly discovered bocavirus (related to the parvovirus) has also been linked to URTI. The term "URTI" is probably a misnomer as it incorrectly implies an absence of lower respiratory tract symptoms. URTI occurs commonly in both children and adults and is a major cause of mild morbidity. URTIs have a high cost to society, being responsible for missed work and unnecessary medical care. Occasionally they have serious sequelae. Often regarded as trivial, URTIs do not receive serious attention in medical school curricula [21].

CONCLUSION:

The study revealed that in rural area, mothers had poor information regarding mode of transmission, diagnosis, availability of treatment, utilization of treatment and complication of RTI, also there is low utilization of basic health services in government set up, lack of mother's education especially in prevention and control of RTI. Health education can change health care seeking behaviors and attitude of parents and other family members to take care during RTI. There is need for strengthening of information education activity in other programmes, raising female literacy level, to help in prevention and control of RTI. Proper training of health workers regarding identification, management and timely referral cases of RTI are essential.

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