Study of acute respiratory infection and diarrhoeal disease among children attending pre-primary schools: A longitudinal study

RV Mohite, SV Kakade, Mahendra M Alate and Dhirajkumar Mane

Abstract

Aim: Longitudinal study was undertaken in Karad Town, to study the epidemiological factors responsible for ARI and ADD, and to assess the magnitude of ARI and ADD among the children in preprimary school.

Material and method: Examination of each subject was carried out. The information was collected from mother/father/guardian and class teacher/anganwadi worker. During this period, parents were told about the signs and symptoms of acute respiratory infections and Diarrhoeal diseases so that they can deliver proper history. The child who was ill during this period and continued to be ill for next month was not taken as a new case in the 1st follow up. For the desired sample to be achieved three private preprimary schools and four anganwadis were covered.

Result: 6.5% children of private pre-primary school children were of birth order more than two. The proportions of LBW children were observed higher (17.8%) in anganwadi children than private pre-primary school children (2.6%) Maximum children of private pre-primary schools belong to nuclear type of family (57.4%), followed by three generation (24.5%) and joint family (18.1%), whereas among anganwadi children, nuclear (47.8%) and joint (45.2%) type of family was observed almost equal proportion.

Conclusion: Even though there is consistently presence of infection, improvement in nutrition status was observed with subsequent follow up visits which suggests that change in level of awareness can be possible even only with concern visit paid to the mothers/community.

Keywords: epidemiological, longitudinal study, magnitude of ARI

Introduction

Malnutrition and infectious diseases both occur in the same unfortunate children and together they play a major role in causing the high morbidity and mortality in them. The factors that depress the nutritional state of the susceptible children seem to be the same factors that magnify the severity of the infectious diseases that the children acquire. Generally dietary and state of nutrition alter susceptibility to infectious diseases [1, 2]. ARI estimated to be the responsible cause for 3.9 million deaths of children annually worldwide. ARI result in 1.9 million childhood deaths per year in developing countries, 20% of these deaths are from India [6, 7]. In India ARTI is one of the major cause of death and it is also one of the major reason for which children are brought to hospitals and health facilities. Every year some 12 million children in developing countries die before they reach their fifth birthday, many during the first year of life. Seven in ten of these deaths are due to ARI (mostly Pneumonia), diarrhoea, measles, malaria, or malnutrition or a combination of these conditions. Diarrhoeal diseases continues to plague the developing world. Resulting in more than 3 million deaths, accounting for 17% of total childhood deaths i.e. under 5 years, children especially those who are malnourished remain at a greater risk. More than 1.5 billion episodes of diarrhoea have been reported in children below 5 years resulting in over 3 million deaths [3].

A major determinant of child health is the health and knowledge of the Child’s mother. It has been seen that the mother is the main caregiver for the child in almost all societies [4].

Correspondence

Dr. RV Mohite
Department of Community medicine, KIMS, Maharashtra, India
So, the knowledge, attitude and health practices of the mothers directly reflect on the health and vitality of the child. Most of morbidity due to diarrhoea is such that, they can adequately managed at home. Health education on the aetiology, prevention and management of the diarrhoea has the potential to establish productive contact between the health services and the community, to increase the capability of the families to recognise the danger signs of diarrhoea in children and to encourage appropriate and early care seeking behaviours [6].

Thus this longitudinal study was undertaken in Karad Town, to study the epidemiological factors responsible for ARI and ADD, and to assess the magnitude of ARI and ADD among the children in preprimary school. In an effort to identify the gaps in awareness and practices in the community and evaluate the bottleneck and reasons for impediments in the fight against the ARI and ADD in this town.

Material and Method

The present study was carried out among the preprimary children to find out the incidence of Acute Respiratory Infection and Acute Diarrhoeal Diseases and also to assess its risk factors associated with it. Community based descriptive longitudinal study. The study was conducted in two areas i.e. Private preprimary schools of urban area and Anganwadis of urban slum area of Karad town. Preprimary school children (3-5 years). Children between 3-5 years at the time of selection of study subject from private preprimary school and Anganwadi. Examination of each subject was carried out. The information was collected from mother/father/guardian and class teacher/anganwadi worker. During this period, parents were told about the signs and symptoms of acute respiratory infections and Diarrhoeal diseases so that they can deliver the child to the early care seeking behaviour. The child who was ill during this period and continued to be ill for next month was not taken as a new case in the 1st follow up. For the desired sample to be achieved three private preprimary schools and four anganwadis were covered.

At the same time post cards were distributed to class teachers/anganwadi workers so that they can inform investigator regarding illness of the child happening before follow up visits and they themself will also notify the illness of the children which will be utilized for gathering information and to prevent the loss of information. Subsequent three follow up visits were carried out at the interval of every 4 months i.e. in the month of April, August & December. During the follow up visits, if the child was having illness (ARI/ADD) which continued after the completion of the time limit of that visit, it was not considered as new case in next follow up procedure was repeated for all the follow ups. And during these visits history of any illnesses including episodes of ARI and ADD till the follow up visit collected from the mother, guardian or class teacher/anganwadi worker of each which enrolled subject was followed by General and systemic examination of the child. A total of 155 children from private preprimary school and 157 children from anganwadi were retained in the study till the end of the study. And after the last visit health education on preventive measures of acute respiratory infections, diarrhoeal diseases and hygiene was imparted to all the parents.

Results

This descriptive longitudinal study was carried out among the children of private pre-primary schools and anganwadis of Karad town. In this study total 312 children were followed up (155 from private pre-primary schools and 157 from anganwadis), excluding 20 dropouts. This study was carried out to find the incidence, attack rate of ARI and ADD and also to find the risk factors for the same illness. During the course of one year follow up, it was observed that, the overall episodes of ARI were 686, with attack rate of 98.71 and of ADD were 327 with attack rate of 78.58, which comes to incidence 2198 (2.198 episodes per child per year) and 1041 (1.041 episodes per child per year) for ARI and ADD respectively.

The population covered to achieve the said objectives were 155 children from three private pre-primary schools and 157 children from four anganwadis were studied. Among which more than 2/3rd (69%) of study population of private preprimary school belong to the age group 56 of 48-60 months and the proportion of boys (68.7%) and girls (69.4%) in the study was almost equal. It was observed that 100% of mothers of private pre-primary school children were literate, of which only 4% were working out of the house, where as almost 60% of mothers of anganwadi children were illiterate but 85% were engaged in working out of the house.

Nearly 1/3rd (32.5%) children of anganwadi were of birth order more than two, whereas only 6.5% children of private pre-primary school children were of birth order more than two. The proportions of LBW children were observed higher (17.8%) in anganwadi children than private pre-primary school children (2.6%). Maximum children of private preprimary schools belong to nuclear type of family (57.4%), followed by three generation (24.5%) and joint family (18.1%), whereas among anganwadi children, nuclear (47.8%) and joint (45.2%) type of family was observed almost equal proportion.

In private pre-primary school children almost half of children belong to socio economic class III (51.6%), followed by class IV (21.3%) and class II (18.1%), whereas maximum children of anganwadi belonged to class IV (45.9%) and class V (45.2%) of modified BJ Prasad. It was observed that the episodes per child per year of ARI in children of private preprimary schools was 1.890 with 293 episodes in one year with attack rate of 94.41%, whereas 0.632 episodes per child per year of ADD’s with 98 episodes in the same year with attack rate of 100%. The incidence of ARI and ADD was observed higher among the boys of private pre-primary school children. Among anganwadi children incidence of ARI and ADD was observed higher than private pre-primary school children. The incidence of ARI was 2503 with 393 total episodes in one year with the attack rate of 100% and the incidence of ADD was 1145 with total episodes of 227 in the same year with attack rate of 100%, but the episodes of ARI and ADD per child per year was observed higher in girls of anganwadis.

![Fig 1: ARI episodes](image)
higher proportion of ADD affected children of anganwadi observed in illiterate (59.5%), working mothers (85.4%), joint family (45.2%), birth order more than 2 (32.5%) and birth weight less than 2.5kgs (17.8%) as compared to ADD affected children of private pre-primary school the difference observed was statistically significant.

Discussion
As we know that the incidence of ARI and ADD are very much higher in under five children, the number of factors that can make difference in occurrence of these diseases vary in various geographical areas, according to change in socioeconomic status and various environmental factors, which was studied in the current study among the pre-school age children of urban (private pre-primary school) and urban slum (anganwadi) by catching them in the preprimary school, so in this study it was observed that the incidence of ARI was very much higher among the anganwadi children (2.5 episodes/child/year) than the private pre-primary school children [6].

The attack rate of ARI in anganwadi children of slum area was found to be 100% where as it was 50% in private pre-primary school children of urban area, this might be due to high proportion of poor ventilation and indoor air pollution in houses of anganwadi children.Maximum mothers of affected children from anganwadi (85.4%) were working out of the houses, as they were day labourers because they were illiterate, where as 97% of the mothers from private preprimary schools were house wife though they were educated and the result obtained was statistically significant [7].

Significantly higher proportion of ARI affected children from anganwadi (32.5%) were of birth order > 2, as compared to the affected children from private pre-primary school (6.6%), similarly in a community based study done by Mitra NK 54 43% of affected cases of ARI were also of birth order more than 2, as it was observed that as the birth order increases the risk to various other infections.In the current study among higher proportion of overcrowding (17.2%), ill ventilated (39.5%) and indoor air pollution (29.3%) was seen in anganwadi affected children than private pre-primary school children. In the current study it was observed that the attack rate of ARI increased in winter season, it was observed that among the diarrhoea affected children boys were most commonly affected, [9] where as in the current study among anganwadi children reverse findings was seen this may be due to unfavourable nutritional and environmental condition for girl child, whereas there is no difference observed in girls and boys suffering with DD’s in private pre-primary school children. As in the current study proportionately large number of children belong to age group 48-60 months, the higher number of affected children also belong to same group than 36-47 months Higher proportion of ADD affected children from anganwadi were of birth order more than 2, in comparison with 6% of affected children from private pre-primary schools Similarly in this study found that 66% of ADD affected children were of birth order more than 2 [8], it means as birth order increases the risk of DD’s also increases.In the current study higher proportion of LBW in ADD affected children as it is known that LBW is predisposing factor for recurrent DD’s [10]. In the current study only 30% of ADD affected anganwadi children were exclusively breast fed in comparison with private preprimary school children ADD affected children with very less proportion of exclusive breast feeding, such poorly fed children get exposed to ingestion of contaminated top feed which leads to DD’s since infancy. As like exclusively breast feeding, poor weaning also contributes for introduction of DD’s and repeated attacks of DD’s since infancy significantly higher proportion of mothers of ADD affected anganwadi children not practicing washing of their hands with soap and water before preparation of food (72%), before feeding their children (76.4%), after feeding (24.8%), after defecation (21%) in comparison to mothers of private pre-primary school children, similarly in the study of Ray SK et al. in urban slum area 98% washed their hands with soap after defecation; [11] Only 36%, 16% and 2% washed their hands with soap before meal, before serving food and before cooking respectively. However, it was observed that 69% used soap and water for hand washing after cleaning the child's faeces. In rural area 71% used soap and water after defecation while 26% used mud or ash. Only 13%, 1%, 1% and 5% used soap and water before meal, before serving food, before cooking and after cleaning the child’s faeces, and Wondwossen Brike Eshete in his study found only 19% of the affected children washed their hands with soap after defecation.

The period prevalence of ADD combined (PVT and anganwadi) was 17.6% during the baseline data collection period which increased in 1st, 2nd and 3rd visits, with mean episodes/child of (0.307, 0.368 and 00.189).

The nutritional status of children affected by diarrhea improved in the second and third follow ups; whereas reverse findings were seen in similar studies carried out by Meriton Stanly et al. and Bhanderi D et al. (23% and 88%) of affected children were malnourished, this might be due to the awareness that has created among the mothers of affected and non-affected children due to repeated follow-ups.

Conclusion
Nuclear family and low socioeconomic status are the indirect supporting factors for ARI and ADD, and poor environmental factors also favours the ARI and ADD. Positive past histories of ARI/ADD suggest the recurrent infections which may affect the nutritional status of the child and thus continuing the vicious cycle of under nutrition and infection. Even though there is consistently presence of infection, improvement in nutrition status was observed with subsequent follow up visits which suggests that change in level of awareness can be possible even only with concern visit paid to the mothers / community.

Conflict of interest: No conflict of interest

References