Original Article

ACUTE DIARRHOEAL DISEASES AMONG PRESCHOOL CHILDREN IN WESTERN MAHARASHTRA, INDIA

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ABSTRACT

Background: 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. Acute Diarrhoeal diseases (ADD's) are reported to be the 2nd leading cause of child morbidity and mortality.

Objectives: To study the attack rate of Acute Diarrhoeal Disease among pre-school children and to study the socio-demographic variables of pre-school children suffering from Acute Diarrhoeal Disease.

Methods: A Longitudinal study was conducted among preschool children (3-5years) of Private pre-primary school of urban area and followed for the period of one year. Mother/ guardian/ teacher was interviewed by using pre-tested proforma.

Results: About 56% of children found suffering from ADD with 0.6 episodes per children per year among private pre-primary school. Higher proportions of ADD affected children were residing in nuclear type of family, belonging to middle socio-economic class, mothers were literate & housewives, born with order >2 compared to non ADD affected children.

Conclusion: More than half of children from private pre-primary schools suffered with nearly one attack of Acute Diarrhoeal Disease. Maternal illiteracy and working mothers found favorable factors. Immunization coverage, EBF and proper weaning play a very important role in prevention of infections.

Keywords: Anganwadi, ADD, Incidence, Literacy, Pre-primary school children

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.[1] The period below 5 years among the children is the most crucial period and if any infection occurs during this period, will affect the growth and development of child because maximum growth and development occur in this period. Among the infectious diseases, acute respiratory infections (ARI) and acute diarrhoeal disease (ADD) are leading cause for childhood mortality and morbidity.[2] acute Diarrhoeal Disease is defined as 'passage of loose/liquid/watery stools 3 or more than 3 times a day. Recent change in consistency of the stool which is important rather than frequency.[3]

In India Diarrhoeal disease is a major health problem among children under the age of 5 years. During 2005 about 1.07 million cases of acute diarrhoea were reported in India with 2040 deaths. Diarrhoeal diseases cause a heavy economic burden on health services.[4] Most of diarrhoeal diseases (88%) are attributed to unsafe water Supply, inadequate sanitation and hy-

giene. Measures like improvement in water supply and sanitation helps in reducing diarrhoeal disease morbidity.[5]

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. 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 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 recognize the danger signs of diarrhoea in children and to encourage appropriate and early care seeking behaviours.[6]

MATERIAL & METHODS:

A community based longitudinal study was carried out among the pre-primary school children (3-5years) to find out the attack rate of Acute Diarrhoeal Diseases & also study the socio-demographic factors associated with it. Sample size was calculated by taking the incidence of acute diarrhoeal diseases from the past study i.e. 11%, [7] and considering 5% error which comes around 151. The formula applied was sample size = $(1.96)^2 \times pq/E^2$. Considering the chances of drop outs during the Course of the study, extra 10% samples were added it. So the final sample size was 166. This sample was taken from private pre-primary school of urban area.

Three Private pre-primary schools from karad city were selected randomly & required number of children's & their mother/guardian/teacher were enrolled for the study by using pre-structured & pretested proforma. The proforma included the baseline data i.e. general particulars of the parents and children and also on birth and immunization history (cross checked from records), breastfeeding history and anthropometric measurements of the child; general and systemic 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 diarrhoeal diseases so that they can deliver proper history.

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, episodes were counted if they appeared freshly after completion of visit & during the visit. This procedure was repeated for all the follow ups. During these visits, history of any illnesses including episodes of ADD till the follow up visit was collected from the mother, guardian or class teacher/ anganwadi worker followed by General and systemic examination of the child.

Ethical clearance was obtained from Institutional Ethical Committee & informed verbal consent from principals of schools and guardians were also obtained prior to the study. Frequency percentage, chi-square test & odds ratio calculations were applied for analysis.

RESULTS

Among private pre-primary children followed for one year 88 out of 155 had attack of ADD one or more time giving an incidence rate of 0.632 episodes/child/year (attack rate 56.77%)

Table 1: Magnitude of ADD among pre-primary school children

Group	Total	Boys	Girls
No.	155	83	72
Children affected in a year	88	48	40
Episodes in a year	98	55	43
Incidence= Episodes/Child/year	0.632	0.662	0.597
Annual attack Rate (%)	56.7	57.8	55.5

Table 2: ADD Episodes according to follow-up visits

Particulars	Baseline	Visit I	Visit II	Visit III
Total Episodes	14	27	43	14
Mean Episodes/child	0.090	0.174	0.277	0.090
Standard Deviation	0.287	0.380	0.449	0.287
Period Prevalence	9%	17%	27.7%	9%

The incidence of ADD was observed higher among the boys of private pre-primary school children compared to girls (table 1).

Table 2 shows the period prevalence of ADD was 9% during baseline data collection which was increased to 17% & 27.7% during 1st & 2nd follow up and then decreased to 9% during last visit. This shows seasonal change in prevalence of ADD, i.e. 1st & 2nd visits were done during summer & rainy seasons respectively whereas baseline data collection & last 3rd visit was undertaken during winter seasons. Other variable like total number of episodes & mean episodes/child also support the seasonal variation.

Table 3: Distribution of Pre-Primary School Children

Particulars	ADD present n=88 (%)	ADD absent N=67 (%)	Total N=155 (%)	χ2 (p value)	OR	95%CI
Sex of the child						
Boys	48(54.5)	35 (56.4)	83 (53.5)	0.01 (0.90)	1.09	0.58-2.07
Girls	40(45.5)	32 (43.6)	72 (46.5)			
Age group(mn)						
36-47	24(27.3)	24 (36)	48 (31)	0.93 (0.33)	0.67	0.33-1.33
48-60	64(72.7)	43 (64)	107 (69)			
Type of Family						
Nuclear	54(61.4)	28 (42)	82 (53)	5.08 (0.02)*	2.21	1.15-4.22
Joint	34(38.6)	39 (58)	73 (47)			
Socio Economic Status						
Upper class	20 (22.8)	09 (13.6)	29 (19)	6.92 (0.03)*	-	-
Middle class	48(54.5)	30 (44.7)	78 (50)			
Lower class	20(22.7)	28 (41.7)	48 (31)			
Maternal Education						
Illiterate	00(00)	00 (00)	00 (00)	-	-	-
Literate	88(56.7)	67 (43.3)	155 (100)			
Maternal Occupation						
Working Mothers	43(48.9)	16 (23.9)	59 (38.1)	9.03 (0.002)*	3.04	1.51-6.13
Non-Working Mothers	45(51.1)	51 (76.1)	96 (61.9)			
Birth Order						
≤2	40(45.4)	31 (46.3)	71 (46)	0.01	0.96	0.51-1.83
>2	48(54.6)	36 (53.7)	84 (54)	(0.001)*		
Birth Weight						
< 2.5Kgs	28 (32)	11 (16.5)	39 (25)	4.00	2.37	1.08-5.21
≥2.5Kgs	60 (68)	56 (83.5)	116 (75)	(0.04)*		

Table 4: ADD affected children and Feeding Practices

Particulars	ADD present N=88 (%)	ADD absent N=67 (%)	Total N=155 (%)	χ2 (p value)	OR	95% CI
Exclusive Breast Feeding						
Present	36 (41)	39 (58.2)	75 (48)	3.89 (0.04)*	0.49	0.26-0.94
Absent	52 (59)	28 (41.8)	80 (52)			
Total Breast Feeding						
Up to 2yrs	43 (48.9)	45 (67.1)	88 (56.7)	4.47 (0.03)*	0.46	0.24-0.90
>2 yrs	45 (51.1)	22 (32.9)	67 (43.3)			
Weaning						
≤6months	47 (46.6)	23 (34.4)	70 (45)	4.84 (0.02)*	2.19	1.13-4.22
>6months	41 (53.4)	44 (65.6)	85 (55)			

The above table no. III showed that, higher proportions of ADD affected children were boys & in the age group of 48-69months but the difference was not found statistically significant. Whereas significantly higher proportions of ADD affected children were residing in nuclear type of family, belonging to middle socio-economic class, whose mothers were literate & housewives, born with order >2 and with birth weight ≥2.5Kgs compared to non ADD affected children.

The above table IV depicts significantly higher proportion of children affected by ADD had not got Exclusive breast feeding and proper start of weaning compared to non ADD affected children whereas total breast feeding was done for up to 2yrs. On application of odds ratio to weaning showed ADD 2.1times more among children in whom weaning was started before 6months.

DISCUSSION

In the current study it is observed that the incidence of ADD's in private pre-primary school children (0.6 episodes/child/year), **Gupta N et al[8]** observed almost similar findings (1.6 epi-

sodes/child/year) of DD's in their study conducted in slum area, where as the incidence of diarrhoea was reported higher from Africa, Asia and Latin America.[9]

In the study of **Molbak et al[10], Bhattacharya et al[11] and Shally Awasthi and Vinod Pande[12]** it was observed that among the diarrhoea affected children boys were most commonly affected, where as in the current study whereas there is no difference observed in girls and boys suffering with ADD'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, similarly of **EI-Gilany A.H. et al[13]** also reported higher proportion of ADD affected children belong to age group (48- 60 months).

Significantly higher proportion of ADD affected children belonged to nuclear family, similar finding (54.7%) was reported by **Bhattacharya et al[11]**.

In the current study more than 50% of mothers of DD's affected children were working which might have contributed for poor nutrition and poor health status of children thus, similar findings was reported by **Mulugeta Teklu[14].**

Higher proportion of ADD affected children were of birth order more than 2 similarly **EI-Gilany A.H. et al[13]** in his study found that 66% of ADD affected children were of birth order more than 2, it means as birth order increases the risk of DD's also increases.

The period prevalence of ADD was 9% during the baseline data collection period which increased in 1st & 2nd visits, with mean episodes/child of (0.09, 0.17, 0.27 and 0.09), similarly prevalence was reported by **Snyder and Merson[8], Bhanderi D et al[14] and Gupta N et al[8]** (2.2 episodes/child/year, 2 episodes/child/year and 1.69 episodes /child /year respectively).

CONCLUSION

Maximum number of children from private pre-primary schools suffered with at least one attack of Acute Diarrhoeal Disease. Maternal illiteracy and working mothers found favorable factors in causing ADD. Immunization coverage, EBF and proper weaning play a very important role in prevention of infections in early life as well as repeated attacks in future.

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