DOI: 10.14260/jemds/2014/2241

ORIGINAL ARTICLE

INCIDENCE OF DIARRHEAL DISEASES AMONG CHILDREN IN KISHANGANJ DISTRICT OF BIHAR

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HOW TO CITE THIS ARTICLE:
Kashif Shahnawaz, Manoj Kumar, Suryadev Singh, Laxman Kumar. "Incidence of Diarrheal Diseases among Children in Kishanganj District of Bihar". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 12, March 24; Page: 3040-3047, DOI: 10.14260/jemds/2014/2241

ABSTRACT: INTRODUCTION: Diarrhoea is a common and preventable disease, but unfortunately in India and other developing countries of the world diarrhoea continues to cause serious problems in infants and children. It is among the topmost causes of morbidity and mortality in children. **OBJECTIVE:** To study different factors responsible for the incidence of diarrhoeal diseases among children of Kishanganj district of Bihar. **MATERIALS & METHODS:** The present study was conducted from July 2013 to Sep. 2013. The sample size has been collected using standard method in CDD household survey manual. To ensure reasonable limit of precision target sample size of approximate 3742 children upto 12 years of age was selected for study. The survey consisted of 30 clusters and each cluster consists of about 125 children. The association of diarrhoea in children in relation to some factors like literacy level of parents, housing condition, socio-economic status and sanitary condition of the house, were studied. **OBSERVATION:** The percentage of diarrhoea cases in children of both illiterate parents, only father literate, only mother literate and both literate parents, were 20.3%, 16.01%, 10.8%, & 8.6% respectively. The incidence of diarrhoea in good and poor housing was 15.1% & 17.6% respectively. The incidence of diarrhoea in low, middle and poor socio-economic group was 17.8%, 14.1% and 50.0 % respectively. The incidence of diarrhoea among children, living in poor and good sanitary condition was 18.5% and 8.9% respectively. **CONCLUSION:** The incidence of diarrhoea was low among children belonging to literate families, living in good housing condition, belonging to middle socio-economic group, and living in good sanitary condition.

KEYWORDS: Diarrhoea, Factors, Children.

INTRODUCTION: Children are the future of a nation. Strength of any nation depends upon its children and the extent to which any generation shapes the future of a country is determined, by the conditions provided for their growth and development. It is a bitter truth that while man is trying to conquer the limits of the universe through space expedition and nuclear power; the children are dying of a very common and preventable disease, diarrhoea. Diarrhoeal diseases are amongst the top three killers of children in the world today.[1] Despite the substantially declining mortality rate from diarrhoea in developing countries, diarrhoea still accounts for approximately 11% of all mortality in children under 5 years of age.[2]

In developing countries like India, diarrhoea continues to be a serious health problem in infants and children, due to multiple determinants, like low socio-economic status and education of mothers,[3,4] Lack of safe drinking water, inadequate sanitation and poor hygiene,[5,6] child malnutrition,[7] crowding[8] and low maternal age,[9] etc. Diarrhoea is defined as defecation frequency of three or more loose/liquid stools in a day (or more frequent passage than is normal for the individual).[10] This is actually, a symptom of infections, caused by a host of bacterial, viral and parasitic organisms, most of which are spread by faeces-contaminated water.[11] Infection is more common

when there is a shortage of adequate sanitation and hygiene and safe water for drinking, cooking and cleaning. Rotavirus and Escherichia Coli are the two most common etiological agents of diarrhoea in developing countries.[12]

The key primary barriers to the transmission of enteric pathogens responsible for diarrhoeal diseases are maintenance of proper sanitation and personal hygiene, safe stool disposal and adequate hand washing, especially after contact with fecal material during anal cleansing of adults and children.[13] A significant proportion of diarrhoeal diseases can be prevented through safe drinking water and adequate sanitation and hygiene.

It is an accepted truth that the subject is vast enough, yet our sincere endeavor is to establish the relationship between literacy level, SES of parents, housing condition, sanitary condition of the house and diarrhoeal diseases in children in an area of Kishanganj district of Bihar.

MATERIALS AND METHODS: This study was conducted in Kishanganj district of Bihar. Study period was from July- 2013 to Sept-2013 (three months). A pre-designed, pre-tested study schedule was used to collect data. Both open and close ended questions were kept in the schedule. Privacy of the children & their parents were maintained.

Confidentiality was gained from parents of the selected children. I have selected Kishanganj district in Bihar, a suitable field of study because of the following reasons. Geographically, this district has a continuity of border with West Bengal state and is very close to Bangladesh. In spite of border restrictions, there is a continuous flow of population between these states. The location of this district also worth mentioning.

It is situated on the low land area on the basin of River Mahananda. This district of Bihar is socially, educationally and economically backward. Sanitation and safe water supply are very meager.

Lack of knowledge of hygiene and the traditional customs are very favorable for the transmission of infections and contagious diseases including diarrhoeal disorders. Health education facilities are practically nil. Health consciousness is at the baseline and the basic preventive requirements of the diseases are far from human sight.

Consideration of all these factors and to find out their role in the causation of children diarrhoea are the aim of my proposed study, although I shall try to establish the contribution of individual factors in relation to the incidence of children diarrhoea. This work has been undertaken to find out various factors, predisposing and exciting in the causation of diarrhoea. The factors of study include socio-economic, environmental and educational in relation to diarrhoeal incidence.

The children selected for study belonged to age group of newborn to 12 years, who are mostly permanent residents of this area or who are residing in this zone for more than 6 months. Children who are visitors from outside of this area are not considered in this study. The survey has been conducted as cluster sampling method as described in WHO/CDD house hold survey manual (CDD/SER/86.2, REV.1989).

The survey consisting of 30 clusters by and large from rural and few from sub and semi-urban population. To ensure reasonable limit of precision target sample size of approximate 3742 children upto 12 years of age was selected. Thus each cluster consists of about 125 children. Having surveyed all the eligible children of the house hold, we moved to next closest household. This process was continued till 125 children were included.

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There were only a few household which did not have eligible children and there was no household which could be marked as absent. Primarily two queries were made in each household-(1) is there one or more than one resident child under 12 years of age in the household, and if so (2) whether or not any of the child is a victim of diarrhoea or any of the children had diarrhoea within the last 2 weeks.

At this point a very pertinent question arouse as to what is the meaning of diarrhoea in the mind of the caretaker of the child.

At this point the definition of diarrhoea ie.3 or more loose or watery stool/day with or without blood for one or more day was properly defined and made to understand in the mind of the caretaker of the child. It was further enquired if there was any case of diarrhoea, what treatment was being given, i.e. antibiotics, antimicrobials, and also questions about ORS or SSS or RHF has been given in the cases which have occurred in the last 24 hrs.

The diagnosis was confirmed after detail and thorough interrogation of the patients and their parents or guardians, clinical examination of the patients and by required pathological examination like routine examination of stool of the sufferer child.

OBSERVATION: In the present study, the study sample was divided into four groups, i.e. both parents illiterate, father literate and mother illiterate, mother literate and father illiterate, and both parent literate. The percentage of diarrhoea cases in these groups are 370 (20.3%), 229 (16.1%), 40 (10.8%) & 9 (8.6%) children respectively. [Table-1]

Parents	**Children**		
	Suffering from diarrhea	**Not suffering from diarrhea**	**Total**
Both illiterate	370(20.3%)	1477	1847(49.3%)
Father literate Mother illiterate	229(16.1%)	1193	1422(38%)
Father illiterate Mother literate	40(10.8%)	329	369(9.8%)
Both literate	9(8.6%)	95	104(2.7%)
Total	**648**	**3094**	**3742**
Percent	**17.3**	**82.7**	**100**

TABLE 1

Showing Incidence of Diarrhoea among children according to literacy level of Parents

In the present study, the study sample was divided into 2 groups, i.e. good or poor. The destination was made on the basis of ventilation, pucca building, and adequate drainage system. In the study sample only 413 (11%) had good housing whereas 3329 (89%) has poor housing. The incidence of diarrhea in good and poor housing was 15.1% and 17.6% respectively. [Table-2]

DOI: 10.14260/jemds/2014/2241

Age in months	Housing					
	Good			Poor		
	Mode of onset					
	Normal	Diarrhea	Total	Normal	Diarrhea	Total
0-5	21	3	24	116	9	125
6-11	9	4	13	89	73	162
12-35	45	16	61	406	217	623
36th and above	276	39	315	2132	287	2419
Total	**351**	**62**	**413**	**2743**	**586**	**3329**
Percent	**84.9**	**15.1**	**100**	**82.4**	**17.6**	**100**

TABLE 2

Showing Incidence of Diarrhoea among children of each age group according to Housing Condition.

In the present study, the number of children in low, middle and poor socio-economic group was 3257(87%), 471(12.6%) and 14(0.4%) respectively. The incidence of diarrhoea in low, middle, and poor socio-economic group was 581 (17.8%), 66(14.1%) and 7(50%) respectively. [Table-3]

Age in months	SOCIO-ECONOMIC STATUS								
	Low			Middle			Poor		
	Mode of onset								
	Normal	Diarrhea	Total	Normal	Diarrhea	Total	Normal	Diarrhea	Total
0-5	114	10	124	22	2	24	1	0	1
6-11	89	70	159	9	7	16	0	0	0
12-35	397	215	612	54	18	72	0	0	0
36th & above	2076	286	2362	320	39	359	6	7	13
Total	**2676**	**581**	**3257**	**405**	**66**	**471**	**7**	**7**	**14**
Percent	**82.2**	**17.8**	**100**	**85.9**	**14.1**	**100**	**50**	**50.0**	**100**

TABLE 3

Showing Incidence of Diarrhea among children of each age group according to socio-economic status

In the present study, children were divided into two groups, as good or poor, on the basis of sanitary condition. In this study, 3308 children (88.4%) were found to be living in poor sanitary condition, i.e. inadequate drainage system, filthy surrounding containing sullage inside and outside the house. Only 434(11.6%) children were found to be living in houses which had a clean surrounding with adequate drainage. The incidence of diarrhea in this poor sanitation group was 18.5%, whereas the incidence of diarrhea was only 8.9% in children living in good sanitary condition [Table-4].

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Age Group in months	Sanitary Condition					
	Good			Poor		
	Mode of onset					
	Normal	Diarrhea	Total	Normal	Diarrhea	Total
0-5	21	2	23	116	10	126
6-11	16	4	20	82	73	155
12-35	53	11	64	396	224	620
36th & above	305	22	327	2103	304	2407
Total	**395**	**39**	**434**	**2697**	**611**	**3308**
Percentage	**91.1**	**8.9**	**100**	**81.5**	**18.5**	**100**

TABLE 4

Showing Incidence of diarrhea among children of each age group according to sanitary condition of the house.

DISCUSSION: In the present study, 3742 children under the age of 12 years were surveyed with a view of finding out the incidence of diarrhea in the child population. The children were divided into four age groups, i.e. 0-5 months, 6-11 months, 12-35 months, and 36th months to 12 years. The frequency of each of these age group was 149 (4%), 175 (4.7%), 684 (18.3%) and 2734 (73%) respectively. A difference in the incidence of diarrhea in present study could probably be due to various factors, e.g. different study methodology, nature of population, geographical factors, socio-economic condition and educational level of different study groups.

In the present study of diarrheal diseases, the maximum incidence of diarrhoea (20.3%) was seen in children, of whom both the parent were illiterate. On the other hand, where both parents are literate, the incidence of diarrhoea was minimum (8.6%). In the other two groups, incidence of diarrhoea was less, where the mother was literate (10.8%) as compared to where father was literate (16.1%), [Table-1].

Literacy, particularly of the mother, has an important impact on the upbringing of children in the family. Mother is the backbone of the family and an educated or literate mother can take a very important role in shaping the future of her child by understanding the preventive aspect of the disease as well as promoting positive health of her child. Diarrhoeal incidence in relation to parental education were studied by Hatt L.E et. Al (2006)[3] and Boadi K. et al (2005).[4] They established a significant relationship between childhood diarrhoeal morbidity and parental education.

The pattern of housing has direct bearing on the level of incidence of diarrhoea. It is said that, sunlight is the best sterilizing agent, as it readily kills micro-organism. Moreover, a well-ventilated room also safeguard against spread of disease. Every dwelling unit must have good drainage system as accumulation of dirty water inside leads proliferation of micro-organism, insects and flies.

In the present study, the incidence of diarrhoea was higher where the housing condition was poor (17.6%) as compared to children who had good housing condition (15.1%), [Table-2]. A previous study conducted in Indonesia also reported an increased risk of having diarrhoea in children with unavailability of sewage and/or a place to dispose the child's stool.[14] contamination of drinking water by sewage due to pump-failure or blockage of a sewage system[(15)] and outbreaks of

viral gastroenteritis resulting from sewage contamination of water supplies have been previously described.[16, 17]

The incidence of diarrhoea within a given sample is strongly influenced by the socio-economic factor. Diarrhoea has often been called as "Disease of poverty" because as living condition improved, the disease tends to reduce in incidence. In the present study also, the incidence of diarrhoea was maximum in children belonging to a low socio-economic group. Saran (1981)[18] reported significantly high incidence of diarrhoea in children belonging to poor families (54.3%) as compared to high socio-economic families (33.67%). Rao and Puri (1973)[19] also observed that children coming to the pediatric hospitals with diarrhoea were mostly from lower socio-economic group [Table-3].

Wagstaff A. et al (2004)[20] shown that the absence of basic sanitation facilities in a low socio-economic family may lead to poor food hygiene and sanitation practices in the households, which are an important contributing factor for diarrhoea.

Since food and water contamination is one of the main causes behind spread of diarrhoea. The quality of sanitary condition often reflects an increase relationship with the incidence of diarrhoea. In the present study, children were divided into two groups, as good or poor, on the basis of sanitary condition. In this study, 3308(88.4%) children were found to be living in poor sanitary condition, i.e. inadequate drainage system, filthy surrounding containing sullage inside and outside the house. only 434(11.6%) children were found to be living in houses which had a clean surrounding with adequate drainage.

The incidence of diarrhoea in these poor sanitation group was 18.5%, whereas the incidence of diarrhoea was only 8.9% in children living in good sanitary condition [Table-4]. The increased risk of having diarrhoea in children, whose mother had poor food hygiene practices in our study was similarly observed in a pri-urban district of Guinea-Bissau.[21] Contaminated weaning food has been suggested as a major contributor to diarrhoea in low income settings as upto 70% of diarrhoea episodes are actually caused by water and food contaminated with pathogens.[22] High incidence of diarrhoea in relation to lack of safe drinking water, inadequate sanitation and poor hygiene was also studied by Mokoni FS et. al (2004).[23]

CONCLUSION: Due to lack of basic civic amenities, children are affected much more than adult population, as their needs are more to maintain a positive health. The present study has been carried out to find the incidence of diarrhea in children under 12 years of age, in Kishanganj district and to collect data on various social and hygienic practices of the children of this area and their living condition in relation to diarrhoea. Followings were the summary of this study:

1. The incidence of diarrhoea was minimum among children belonging to literate families as compared to children belonging illiterate families. When one parent was literate, the incidence of diarrhoea was less where mother was literate as compared to where father was literate.
2. The incidence of diarrhoea was less in children living in good housing condition (15.1%) as compared to children living in poor condition (17.6%).
3. The incidence of diarrhoea in low and poor socio-economic group was higher 17.8% and 50% as compared to children belonging to middle socio-economic group (14.1%).
4. Children are more prone to develop diarrhoea who were living in poor sanitary condition (18.5%) as compared to children living in good sanitary condition (8.9%).

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Date of Submission: 25/02/2014.
Date of Peer Review: 26/02/2014.
Date of Acceptance: 14/03/2014.
Date of Publishing: 19/03/2014.