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ORIGINAL ARTICLE

ASSOCIATION OF DIARRHOEA WITH PRACTICES OF HAND WASHING AND EXCRETA DISPOSAL IN CHILDREN

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ABSTRACT: INTRODUCTION: Diarrhoea is a common and preventable disease, but still it accounts for approximately 11% of all mortality in children under five years of age. Diarrhoeal infections are more common when there is a shortage of adequate sanitation, hygiene and safe water for drinking, cooking and cleaning. To prevent stool pathogens from gaining access to the domestic environment, efforts should concentrate on hand washing after stool contact, especially after defaecation or after cleaning up a child. **MATERIALS AND METHODS:** Present study was conducted from Dec-2014 to Feb-2015, after selecting a total of 500 children. The association of diarrhoea in these children were studied in relation practices of hand washing and excreta disposal among them. **OBSERVATION:** It was observed in our study that the incidence of diarrhoea was more in children excreting inside the household premises (32%), in comparison to those excreting outside (11.5%). Incidence of diarrhoea in children having the habits of washing hands was lower (13.6%), than the children not having the habit (21.8%). **CONCLUSION:** Based on the above findings we conclude that human stools in the domestic environment are a source of diarrhoeal infection, and safe disposal of stools should be one of the key measures to prevent diarrhoeal diseases.

KEYWORDS: Diarrhoea, Excreta disposal, Hand washing.

INTRODUCTION: Diarrhoea is a very common and preventable disease, but unfortunately in India like other developing countries, it still accounts for approximately 11% of all mortality in children under 5 years of age.[1] In India and other developing countries of the world diarrhea is a serious health problem in children, due to multiple determinants, like low socio-economic status and education of the mothers,[2,3] lack of safe drinking water, inadequate sanitation and poor hygiene,[4,5] child malnutrition, overcrowding and low maternal age.

Hand washing can interrupt several of the transmission routes. The promotion of hand washing with soap is an intervention that appears to be both highly effective, reducing diarrhoea incidence by between 27 and 89%, and feasible (Kaltenthaler et al).[6] To prevent stool pathogens from gaining access to the domestic environment, efforts should concentrate on hand washing after stool contact, especially after defaecation or after cleaning up a child.

In India, a majority of the population still defaecate in the open.[7] Due to excreta disposal in open, infective material leaves a human host via faeces, multiply (or not) in the environment, be ingested by an animal host, colonize the animal host, release infective material back to the environment to multiply (or not), before being ingested by a new human host. Examples of enteric pathogens for which man is the principal reservoir, and whose transmission mostly originates from human faeces are entamoeba histolytica, and viruses such as rotaviruses, adenoviruses, and astroviruses. Flies landing on excreta can carry pathogens to foods or surfaces that are used for food preparation or eating.

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Human or animal feet that tread in faecal material deposited in the open bring pathogens into the domestic environment and children playing with or eating faecally contaminated earth can ingest pathogens. Excreta can contaminate water sources, and contaminated water can be drunk directly or used in food preparation.

MATERIALS AND METHODS: This study was conducted in the department of paediatrics, Katihar Medical College, Katihar, after obtaining institutional ethical committee approval, from the period of Dec-2014 to Feb-2015 (three months). A total of 500 children suffering from diarrhoea were selected for the present study from both the outdoors and indoors of the department of paediatrics in the study period. A semistructured proforma containing questionnaire was used to collect data. Both open and closed ended questions were kept in the schedule. Privacy of children and their parents were maintained. Confidentiality was gained from parents of the selected children. The children selected for the study belonged to the 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. At this point, a very pertinent question arouse as to what is the meaning of diarrhea in the mind of the caretaker of the child. At this point the definition of diarrhoea, i.e 3 or more loose 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. The diagnosis of diarrhea was confirmed after detailed history taking of the patients and their parents, thourough clinical examination of the patients and by routine pathological examination of the stool of patients. Stastistical calculations were expressed as percentages.

Finally, the relation of diarrhoea in children in relation to some factors, related with the sanitation practices like source of drinking water, defecation practices & habit of cleaning hand were established.

OBSERVATION:

Age group in months	**Excreta Disposal: Home**			**Excreta Disposal: Outside**		
	Mode of onset					
	Normal	**Diarrhoea**	**Total**	**Normal**	**Diarrhoea**	**Total**
0-6	16	02	18	00	00	00
7-12	13	07	20	00	00	00
13-35	34	21	55	28	12	40
36th & above	05	02	07	326	34	360
Total	**68**	**32**	**100 (20%)**	**354**	**46**	**400 (80%)**
Percentage	68	32	100	88.5	11.5	100

Table 1

Diarrhoea Among Children According to Practices of Excreta Disposal: In the present study, majority of the cases,i.e 400(80%) children were defecating outside the household premises whereas in 100(20%) children were defecating somewhere within the household premises. [Table-1]

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Age group in months	Habit of washing Hand					
	Yes			No		
	Mode of onset					
	Normal	Diarrhoea	Total	Normal	Diarrhoea	Total
0-6	09	01	10	11	01	12
7-12	06	03	09	07	09	16
13-35	27	07	34	33	24	57
36th & above	124	15	139	190	33	223
Total	**166**	**26**	**192 (38.4%)**	**241**	**67**	**308 (61.6%)**
Percentage	86.4	13.6	100	78.2	21.8	100

Table 2

Diarrhoea Among Children According to Habit of Washing Hand: Our study also shows that, 192(38.4%) children had the habit of washing their hand, whereas 308 (61.6%) children did not have any habit of washing their hand before taking food or after defecation (where children did not take food themselves, their mother were enquired about habit of washing hand). [Table-2]

DISCUSSION: In the present study, a total of 500 children under the age of 12 years were studied with a view of finding out the incidence of diarrhoea in the child population. The children were divided into four age groups, i.e 0-6 months, 7-12 months, 13-35 months and 36th months to 12 years:

i. In majority of the cases (80% children), excreta were thrown outside the house whereas only 20% of the children were defecating somewhere in the house boundary. In my study group only 3 houses had sanitary latrine. Unfortunately, even in that household, children were found to be defecating in open. In this study, the incidence of diarrhoea was much higher where the children defecating inside the house premises whereas the incidence was much lower in children who defecated outside the house hold premises [Table-1].
ii. In our study, the incidence of diarrhoea in children having the habit of washing their hand was 13.6%, whereas the incidence in children not having the habit of washing their hand was 21.8% [Table-2].

The association between stool disposal and child diarrhoea has been investigated in a number of epidemiological studies. Indiscriminate defaecation near the home or in living areas was found to be associated with an increased incidence of diarrhoea (Stanton & Clemens[8] and Han & Moe.[9] Baltazar & Solon [10] in their study found a 64% increase in pathogen positive diarrhoea in families where children stools were inadequately disposed. Mertens et al[11] reported that unsafe stool disposal was associated with a 54% greater diarrhoea risk in Srilanka and deducted that, if such practices were reduced from 91% to 50% of the population, then 12% of diarrhoeal episodes could be prevented. A case control study of the risk factors for diarrhoea in children under three years in Burkina Faso (Traore et al)[12] reported that the unsafe disposal of child stools (left lying on the ground, thrown on a heap or outside the compound) was associated with a 50% increase in the risk of hospitalization with diarrhoea by comparison with disposal in a latrine (95% confidence interval 1.09-2.06). Daniels et al [13], suggested in their study that the presence of a latrine may reduce diarrhoeal infection by a quarter, especially in households with good hygienic practices.

Proper hand washing practices can interrupt several of the transmission routes. There are a number of epidemiological studies on hand washing which claim substantial reductions in diarrhoeal morbidity. Wilson et al,[14] reported a reduction in diarrhea incidence of 89% through the promotion of hand washing in four different circumstances, including after defaecation, in an Indonesian village. Han and Hlaing,[15] claimed a 30% reduction in diarrhoea morbidity in Burma through encouraging regular hand washing with soap. Many studies have been carried out in Bangladesh, where Clemens and Stanton[7] and Alam et al,[16] suggested that hand washing was one of the factors which lowered the incidence of diarrhoea in interventions. Hoque et al,[17] found a reduction in diarrhoea prevalence associated with lower numbers of faecal colony-forming bacteria on hands, six years after an intervention to improve water, sanitation and hygiene in Bangladesh. Pinfold et al,[18] also found in their study that a significant reduction in hand contamination and diarrhoeal diseases was observed from an intervention to promote hand washing and dishwashing in Thailand.

CONCLUSION: The incidence of diarrhoea was found to be less in children defaecating outside the house hold premises (11.5%), as compared to children defecating the house hold premises (32%). It was found to be less in children whose mothers were having the habits of cleaning their hands before taking food or after defecation (13.6%) as compared to children and their mothers who were not having the habits of cleaning their hands before taking food or after defecation (21.8%).

All the transmission routes can be blocked by changes in the domestic hygiene practice. Improved infrastructure such as water and excreta disposal facilities, can also contribute to preventing transmission. Nevertheless, the consistent nature of the above findings and the force of biological arguments that human stools in the domestic environment are a source of diarrhoeal infections for small children, support the conclusion that the safe disposal of stools should be one of the key measures to prevent diarrhoeal diseases.

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