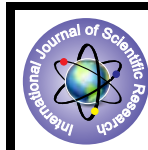


Identification of Maternal, Environmental and Hygienic Practices as Risk Factors for Diarrhoea



Medical Science

KEYWORDS: Risk factor, Diarrhoea, Maternal factors.

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ABSTRACT

Objective: To identify maternal, environmental and hygienic determinants of childhood diarrhoea which can be modified to improve child health.

Methods: This was a case-control study matched for age and sex under 3 years children. A case was defined as ≥ 3 loose stools per day in a child and was the first person in the household with diarrhoea. Controls were healthy children residing in the nearby household and had no history of diarrhoea in last one month. The households with children < 3 years were selected by simple random sampling method.

Results: The risk of diarrhoea was 64% lower who were literates than illiterates ($OR=0.36$, $95\%CI=0.22-0.57$, $p=0.0001$). The children of housewife's were significantly at greater risk of diarrhoea than working ($OR=2.11$, $95\%CI= 1.20-3.70$, $p=0.008$). The hand washing by mother before feeding the child and after cleaning faeces were found to be significantly associated with the risk of diarrhoea. The risk of diarrhoea was about two times higher among those where the water was stored in container ($OR=1.81$, $CI=1.08-3.01$, $p=0.02$). The presence of toilet facility in the house was at lower risk for diarrhoea.

Conclusion: The present study has identified important socio-economic and environmental determinants that contribute to the occurrence of diarrhoea in under 3 years children. Mothers with some education protected their children against diarrhoea better than mothers with no education under poor environmental settings.

INTRODUCTION

Diarrhoeal disease remains one of the principal causes of morbidity and mortality in children. Globally, children aged less than five years experience, on average, 3.2 episodes of diarrhoea every year¹, and consequently 1.87 million children will die from dehydration associated with diarrhoeal disease². It is usually a symptom of an infection in the intestinal tract, which has a variety of causative agents including viruses, bacteria and parasites^{3,4}. Diarrhoeal infection spreads through the ingestion of contaminated food or drinking-water, or person-to-person as a result of poor hygiene.

Environmental and maternal care seeking variables are key implementation priorities that are likely to contribute in reduction of mortality due to diarrhoeal disease⁵. As supplemental food and fluids are introduced, if the mother knows and practices good hygiene, is able to prevent contamination of her child's food, and keeps the dwelling and its surroundings free of waste-water and excreta, the child may still remain healthy. Child diarrhoea needs to be understood through the mother because a child's world is predominantly controlled by and experienced through the mother. Additionally, the extent to which a mother can care for her child is governed by various familial, social, and cultural factors. The mother is linked to her child biologically and also takes care of her child's basic needs. When a mother is absent due to maternal death, there is an increased likelihood of child morbidity and mortality⁶. Low socioeconomic status, lack of maternal education, unsatisfactory health knowledge, short birth intervals, poor hygiene practices, inadequate disposal of child's stools, and insufficient breastfeeding are maternal factors that have been linked to an increased risk of child morbidity and mortality due to diarrhoea⁷. Nearly 90% of diarrhoea is attributed to unsafe drinking water, inadequate sanitation and poor hygiene⁸.

The objective of the present study was to identify maternal, environmental and hygienic determinants of childhood diarrhoea which can be modified to improve child health.

MATERIAL AND METHODS

Study design

This was a case-control study matched for age and sex of the child conducted in the field practice area of the Department of

Pediatrics, Hind Institute of Medical Sciences, Barabanki, UP, India. Children age < 3 years were included in the study. The parents or guardians of eligible children were asked for informed consent to participate in the study

Case definition

A case was defined as ≥ 3 loose stools per day in a child and was the first person in the household with diarrhoea. The latter criterion was established to help elucidate environmental risk factors for diarrhoea, rather than intra-household transmission. Those who met the case definition for diarrhoea were enrolled as a case regardless of whether the current episode was a recurrent episode.

Control definition

Controls were healthy children residing in the nearby household and had no history of diarrhoea in last one month. The controls were interviewed at the same time to avoid any bias and to maintain the comparability of the cases and controls.

Sampling

A simple random purposive sampling method was adopted. Considering 17% exposure of diarrhoea in controls and assuming 80% power with 5% significance level, the required sample size was 145 in each cases and controls.

Tools of investigation

A predesigned and pretested interview schedule was used to elicit information on socio-demographic characteristics and required information. The schedule was pretested on a sample of 10 children and necessary modifications were made in the schedule to overcome the difficulties encountered during pretesting.

Data collection

The households with children < 3 years were selected by simple random sampling method. In case, there were no eligible children in the selected household, the next household was taken in the sample. The survey was carried out till the desired number of study units was completed. Each participant was explained about the purpose of the study prior to administration of tool. The confidentiality was assured. Interview was started with general discussion to gain confidence and it slowly extended to

the specific points related to hygienic practices and the associated socio-demographic characteristics.

Analysis

The results are presented in mean±SD and percentages. The univariate and multivariate logistic regression analysis was carried to find out the risk factors for incidence of diarrhoea. The unadjusted odds ratio (OR) and its 95% confidence interval (CI) was calculated as well as adjusted OR. The p-value <0.05 was considered significant. All the analysis was carried out by using SPSS 16.0 version.

RESULTS

Table-1 describes the maternal related factors associated with the risk of diarrhoea among the children <3 years. The risk of diarrhoea was 64% lower who were literates than illiterates (OR=0.36, 95%CI=0.22-0.57, p=0.0001) and this was statistically significant. The children of housewife's were significantly at greater risk of diarrhoea than working (OR=2.11, 95%CI= 1.20-3.70, p=0.008). The family size was associated with the risk of diarrhoea, however, the risk was higher among larger family size. The hand washing by mother before feeding the child and after cleaning faeces were found to be significantly associated with the risk of diarrhoea.

The environmental and hygienic factors associated with the risk of diarrhoea is presented in the Table-2. The children living in Kucha and semi-pukka houses were at greater risk of diarrhoea than living in pukka houses. The presence of animal in the house and hand pump as the source of drinking were not significantly (p>0.05) associated with the risk of diarrhoea. The risk of diarrhoea was about two times higher among those where the water was stored in container (OR=1.81, CI=1.08-3.01, p=0.02). The presence of toilet facility in the house was at lower risk for diarrhoea.

DISCUSSION

This study has revealed the important determinants of childhood diarrhoea among under three children. Out of environmental variables, the presence of toilet facility, storage of drinking water and source of drinking water were found to be significantly associated with childhood diarrhoea.

Children from households with toilet facility were 83% at lower risk of diarrhoea than children living in households without toilet facility; this finding is consistent with the findings in other studies^{9, 10, 11}. In this study, the hygienic practices like hand washing by mothers before feeding and after cleaning faeces of child may significantly affected the occurrence of childhood diarrhoea. The type of toilet facility and stool disposal schemes might shade light on the notions of household sanitary conditions and as such on the possibility of the transmission of diarrhoeal pathogens through fecal contamination^{12, 13}.

Of all the socio-economic variables considered in the present study, the maternal education and occupation were significant risk factors for diarrhoea. The findings of this study regarding maternal education emphasizes that mothers with lower educational status put their children at higher risk for having diarrhoea, which is in line with a community-based cross-sectional study in Ethiopia, Zimbabwe, Uganda, India and in a case control study done in Lesotho^{14, 15, 16, 17}. Mother's literacy influences hygienic practice, child feeding, weaning and sanitation practices which in turn were important factors for childhood diarrhoea.

The maternal occupation was found to be significantly associated with childhood diarrhoea. The findings of this study suggested that children of mothers whose occupation was non-working had a higher risk of diarrhoea compared with children whose mothers were working; this result is in line with a case control study in Iran¹⁸. A study in Egypt showed a result quite contrary to this; children whose mothers were not working or farmers or manual laborers had a significantly higher frequency of diarrhoea¹¹. In Nigeria, mothers in informal occupations had 23% more likelihood of child diarrhoea compared to mothers in other occupational categories¹⁹. The

effect of maternal occupation on childhood diarrhoea varied from study to study; this might be due to the difference in economic activities of each place studies took place. This study clearly indicated that children of uneducated mothers were the most vulnerable to diarrhoea in the absence of toilet facilities. This is consistent with a study in Ethiopia and Ghana^{20, 21}. Thus, educated mothers without toilet facilities can manage to reduce the risk of diarrhoea even though these children are ex-ogenously exposed to a higher risk of diarrhoea.

In general, the findings of this study have important policy implications for health intervention programs and underline the view that encouraging girl's education may have a considerable importance on child health and survival in this region.

One of the limitations of this study that the data was collected cross-sectionally; in such studies it is difficult to take into account seasonal differences of the occurrences of diarrhoea. Therefore, there is need to study in different season to account for seasonal variations.

CONCLUSION

The present study has identified important socio-economic and environmental determinants that contribute to the occurrence of diarrhoea among under 3 years of children. Mothers with some education protected their children against diarrhoea better than mothers with no education under poor environmental settings.

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Conflict of interest

None

Source of funding

None

Table-1: Maternal related factors associated with the risk of diarrhoea

Factors	Cases No. (%) (n=150)	Controls No. (%) (n=150)	OR (95%CI), p-value
Education			
Literate	48 (32.0)	85 (56.7)	0.36 (0.22-0.57), 0.0001*
Illiterate	102 (68)	65 (43.3)	1.00 (Ref)
Occupation			
Housewife	126 (84.0)	107 (71.3)	2.11 (1.20-3.70), 0.008*
Working	624 (16.0)	43 (28.7)	1.00 (Ref)
Family size			
<5	32 (21.3)	29 (19.3)	1.00 (Ref)
≥5	118 (78.7)	121 (80.7)	1.13 (0.64-1.98), 0.66
Hygienic practices			
Hand washing before feeding to the child with soap			
Yes	54 (36.0)	130 (86.7)	0.08 (0.04-0.15), 0.0001*
No	96 (64.0)	20 (13.3)	1.00 (Ref)
Hand washing after cleaning faeces of child			

Yes	73 (48.7)	114 (76.0)	0.29 (0.18-0.49), 0.0001*
No	77 (51.3)	36 (24.0)	1.00 (Ref)

OR-Odds ratio, CI-Confidence interval, Ref-Reference category, *Significant

Table-2: Environmental and hygienic factors associated with the risk of diarrhoea

Factors	Cases No. (%)	Controls No. (%)	OR (95%CI), p-value
Environmental			
Type of house			
Pucka	27 (18.0)	43 (28.7)	1.00 (Ref.)
Semi-pucka	61 (40.7)	54 (36.0)	1.79 (0.98-3.29), 0.06
Kucha	62 (41.3)	53 (35.3)	1.86 (1.02-3.41), 0.04*
Animal in the house			
Yes	39 (26.2)	35 (23.3)	1.16 (0.68-1.97), 0.56
No	110 (73.8)	115 (76.7)	1.00 (Ref)
Source of drinking water			
Tap	71 (47.3)	53 (35.3)	2.09 (1.17-3.74), 0.01*
Hand pump	49 (32.7)	50 (33.3)	1.53 (0.83-2.80), 0.16
Other	30 (20.0)	47 (31.3)	1.00 (Ref)
Storage of water in container			
Yes	116 (77.3)	98 (65.3)	1.81 (1.08-3.01), 0.02*
No	34 (22.7)	52 (34.7)	1.00 (Ref)
Toilet facility in the house			
Yes	32 (21.3)	92 (61.3)	0.17 (0.10-0.28), 0.0001*
No	118 (78.7)	58 (38.7)	1.00 (Ref)

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