RELATIONSHIP BETWEEN WATER CONSUMPTION AND DYSENTERY IN TEKNAF: A RURAL BANGLADESH VILLAGE

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Bangladesh is said to be the gift of the rivers. The large majority of its population live close to multiple sources of water like rivers, canals, ponds and wells. Due to poor hygienic practices, most of these water sources become heavily polluted by human and other organic wastes giving rise to frequent epidemics of waterborne diarrhoeal diseases including cholera. Although water is so universally available, over 25% of Bangladesh population live in areas where both sources and quantity of water is limited. Some districts of northern Bangladesh, parts of Chittagong and Chittagong Hill Tracts are relatively dry and water is treated as a valuable commodity, particularly during the dry season of the year. Teknaf situated in the south-eastern part of Bangladesh has a layer of volcanic rock at a depth of 8-15 feet. In some parts of this area it is difficult to dig wells and sink hand pumps. The sources of water for drinking and washing are limited to the few communal wells. Reports of fights over the limited quantity of water in these communal wells are not uncommon during the pre-monsoon period between January to March.

A large number of families use these communal wells as sources of water for both drinking and washing. Due to the

conservative nature of the society, the women usually carry water to their homes in earthenware pitchers early in the morning and again in the evening after the sun-set.

Since the quantity of water used for washing and bathing is directly related to the level of cleanliness and hygienic practices of the respective family it was considered worthwhile to attempt to obtain some quantitative information on this relationship. Incidences of shigellosis was used to measure this level. The present report is based on an evaluation carried out amongst the families living in Jaliapara and Kulalpara of Teknaf Dysentery Project area.

MATERIALS AND METHODS

A questionnaire was devised to obtain information on the quantity of water carried to each family from the communal wells. Water carried for both drinking as well as washing were recorded. Those families who had sources of water near or inside their homes and did not carry water were excluded from this study.

Only a small number of communal wells had sufficient depth of water to satisfy the needs of the large number of families. Water pitchers of standard design were manufactured in Teknaf and used universally to carry water in the area. The quantity of water held by the pitchers from each of the families were

measured and were expressed in "seers" which is very close to a litre. Number of persons in each family were recorded in the census books which were being kept updated.

A routine surveillance was continued for the population of Jaliapara and Kulalpara where information on incidence of diarrhoea and dysentery were collected at weekly intervals. Any child who became ill from dysentery or diarrhoea also reported to the treatment centre close by. Rectal swabs were collected for routine bacteriological investigation by using a kerosene incubator.

The report here covers the period between January and December, 1976.

RESULTS

Table 1 shows the incidences of clinical dysentery and confirmed shigellosis according to the volume of water consumed for washing, bathing and drinking. Once water is brought to home it was kept in seperate containers. Although drinking water might be used for washing, reverse is unlikely to happen.

The table shows the number of persons in each catagory classified according to the amount of available water for each person. Children and adults were considered as equal

units as far as total consumption of water was concerned. There was a decreased rate of incidences of both clinical dysentery as well as bacteriologically confirmed cases with the increased consumption of water. Thus, the attack rates were significantly different between those using 20 litres compared to 30 litres.

DISCUSSION

There are many factors associated with a high incidence of shigellosis. Water is only one of such factors. Although the principal mode of transmission in shigellosis is from person to person, waterborne infection has been documented in a number of occasion. The preliminary data here suggested that an availability of a larger quantity of water may have a close association with its incidence through better hygienic practices. Increased quantity of water is mainly used to wash foods, utensils and hands, as well as anals areas of children and adults after defaecation. Its availability in plentiful quantity may also encourage frequent bathing and washing of hands, particularly amongst the female inmates of the house who act as the food handlers. Water, therefore, may act as a vehicle for washing the organisms away and decreasing them a quantitatively. Increased consumption of water however also suggests a higher standard of living and consequently a

greater awareness of some aspects of personal hygiene. In this community, the pattern of living does not seem to have a relationship with their economic status. The uniformity of living style is mainly due to a lack of education and lack of exposure to a better hygienic condition.

Family size may have some relationship with incidences of dysentery. If the quantity of water carried to the home does not increase with the increasing number of persons in the family, the availability of water per person will decrease. Also a large family stands the chance of importing dysentery from outside contacts more often than a small family. A large family often has more children who have higher rate of dysentery than adults. An analysis was done to find out the effect of family size on dysentery and shigellosis with the increasing family size, the differences were not statistically significant in shigellosis. However, there were significant differences in clinical dysentery between the smallest and the largest families.

This preliminary analysis therefore suggests that the amount of water carried to homes for washing and bathing has significant relationship with incidences of both dysentery and shigellosis. The relationship was less marked with the size of the family.

TABLE 1

RELATIONSHIP BETWEEN THE AMOUNT OF WATER USED AND THE INCIDENCES OF CLINICAL DYSENTERY AND SHIGELLOSIS IN TEKNAF

LIT/PERSON/DAY	NO OF PERSONS	CASES OF DYSENTERY		ATTACK RATE/1000/YEAR	
		CLINICAL	SHIGELLA POSITIVE	DYSENTERY	SHIGELLA POSITIVE
<20	1034	323	57	312 [a]	54 [1]
21 - 29	857	201	34	234 [b]	39 [2]
30+	674	130	19	193 [c]	28 [3]
All	2565	624	110	243	43

a Vs b : p< 0.01

a Vs c : p< 0.01

b Vs c : p< 0.05

1 Vs 3 : p< 0.01

TABLE 2

RELATIONSHIP BETWEEN THE FAMILY SIZE AND THE INCIDENCES OF CLINICAL DYSENTERY AND SHIGELLOSIS IN TEKNAF

FAMILY SIZE	NO. OF PERSONS	CASES OF DYSENTERY		ATTACK RATE /1000/YEAR	
		CLINICAL	SHIGELLA POSITIVE	DYSENTERY	SHIGELLOSIS
1 - 4	581	122	22	210 [a]	38
5 - 6	1058	280	50	265	47
7 -10	1753	488	85	276 [b]	49
11 +	523	160	30	306 [c]	57
All	3915	1050	187	268	48

a Vs b: $p < 0.01$

a Vs c: $p < 0.01$