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Short Communication

Unfinished agenda of acute diarrhoeal disease in tea garden of Dibrugarh, Assam

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ABSTRACT

About 600 million people fall ill with foodborne illness every year and reporting takes place in the event of mortality or large attendance in health facilities with similar illnesses. An analysis of outbreak of diarrhoeal disease was conducted in a tea garden of Assam using standard IDSP format. Rectal swabs and water samples were tested. In depth interview was conducted with stakeholders. A rapid sanitation survey was done using questionnaire and observation method. Source of drinking water was from individual tube wells without any pre-treatment. Condition of toilets were insanitary with wide practice of open-air defecation. Water sample (8 numbers) from the tube wells were tested and 7 were found contaminated. Rectal swabs collected from 28 individuals and 12 were positive for *Vibrio cholera*. Attack rate was 2.5% and case fatality rate was 2%. After active intervention the outbreak could be controlled. Provision of adequate potable water, improved sanitation, and hygienic practices and early intervention has potential to prevent the future occurrence of acute diarrhoeal disease and its related mortality.

Keywords: Diarrhoea, Cholera, Tea garden

INTRODUCTION

Acute diarrhoeal disease (ADD) remains a major public health problem affecting the vulnerable communities in India. With more than 13 million cases and more than 25% occurrence of all outbreaks, ADD poses a significant burden in India.[1] With the onset of monsoon rain, the probability of such outbreak soars high due to inappropriate management of water supply and sanitation.[2] Intake of contaminated food or drinks and inappropriate hand hygiene is the easiest mode of spread of the infection.[3]

Though Assam is the largest tea producing state in the country yet the plantation workers reside in poverty, illiteracy, malnutrition and lack of accessibility to health services with lower socio economic condition.[4] The practice of open air defaecation is 19% more evident in lower socio economic group and such practice leads to transmission of diarrhoeal disease and so the present study intends to conduct an analysis of outbreak of diarrhoeal disease among plantation workers in a tea garden of Assam.[5,6]

METHODS

Epidemiological investigation of an outbreak of diarrhoeal disease was conducted following two reported deaths. Rapid response team of integrated disease surveillance programme (IDSP) was utilized for outbreak investigation and containment measures. Line listing of cases was done and analysis of collected data done by using descriptive statistics. In depth interview was conducted among stakeholders till saturation level and narrative analysis was presented.

A rapid sanitation survey was conducted to know the water, sanitation, and hygiene (WASH) among the

residents of the tea garden using questionnaire and observation method.

RESULTS

With the onset of monsoon rains, outbreak of acute diarrhoeal disease broke out in a tea garden of Dibrugarh in the families of the tea plantation workers in June 24. Concern was raised following a death with loose watery motion on 08 June 2024 which was followed by another death in an attendee at the funeral of the deceased. Similar illness broke out subsequently among the other inhabitants. This was followed by rapid investigation and analysis revealed that a total of 94 cases were line listed (Figure 1) and attack rate was 2.5%. Case fatality rate was 2%.

Rectal swabs collected from 28 cases showed presence of *Vibrio cholera* 01 Eltor Ogawa serotype in 12 patients. Out of 94 affected, 42.56% were males and 57.44% were females (Table 1). Source of water was tube well on sharing basis among five families without any pre-treatment. Water samples from tube wells were sent for bacteriological examination to microbiology department of Assam Medical College and it revealed contamination with *V. cholera*. Toilets were insanitary and there was wide practice of open-air defecation.

Table 1: Age and sex distribution of cholera cases.

Age (years)	Male		Female	
	Number	%	Number	%
0-20	7	17.5	20	37.03
21-40	18	45	19	35.19
41-60	14	35	13	24.08
61-80	1	2.5	2	3.7
Total	40	100	54	100

Sanitation survey revealed that due to absence of concrete platform in 82.2% (Figure 2) waste water collects in base of tube wells and 81.3% does not have any drainage facilities (Table 2).

Practices leading to cholera

In depth interview with tea garden inhabitants revealed that there was no practice of washing hands with soap following defecation or before eating meal. Using soap is considered a luxury and not an essential commodity. They use the toilets mostly for storing wooden logs to be used as fuel or for hanging clothes in a clothesline. They prefer to defecate in open air in the gardens mostly as a behaviour or habit as even the graduate youngsters are not using the toilets as has been reported by one of the stakeholders. Until few years ago when during the rainy season the toilet trenches got overflowed, it became unusable and so they preferred defecating in open air, which became a habit and behaviour which the residents are still practicing. With the monsoon, the flood water inundates the garden and the practice of open air defecation poses a health hazard as the drinking water sources are contaminated. The inhabitants revealed that there was no pre-treatment of drinking water. They call the un-boiled water as "kutcha pani" which is consumed with meals. The term boiling is understood as adding tea leaves and salt to hot water which they consume as tea, not the water for drinking. The patients prefer garden hospital for their illnesses, takes prescribed medicines if available in garden pharmacy, however refuses to attend public hospitals when referred and prefers over the counter drugs or herbs which they feel will heal them.

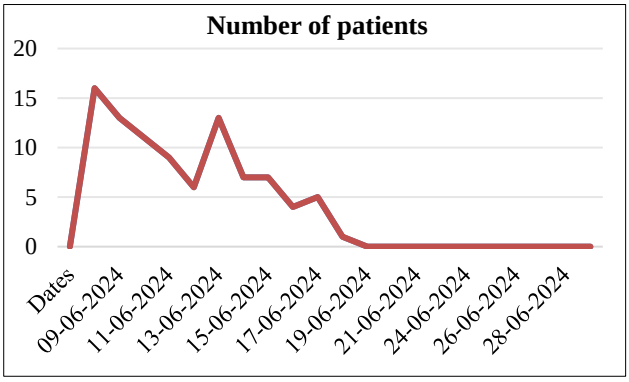

Figure 1: Epidemic curve.

Table 2: Distribution of study participants according to sanitary survey.

Variables	Number	Percentage
Latrines within 10 metres of hand pump?	319	39.8
Domestic animals approach the hand pump?	140	17.5
Any other source of contamination within 10 metres of hand pump?	454	56.6
Waste water collects on base of hand pump?	659	82.2
Is drainage channel missing, damaged or blocked with debris?	652	81.3
Does people regularly bath, wash clothes or washes for cooking in hand pump?	755	94.1

People mostly attend the garden markets held on Saturdays every fifteen days' interval for all kinds of household needs, clothes and eateries. Sweets and snacks are sold in open without any cover exposing them to flies and other insects (Figure 3). Pets, poultry and other domestic animals like goat are kept in the same room where people live. There is usually one bed in every household underneath which poultry and goats are kept.

Similar kind of diarrhoeal illnesses are reported on and off throughout the year in the garden hospital but took the

outbreak form with the onset of rains when many fell ill at the same time.

Another stake holder exclaimed that in day time as parents move out to work in garden the children are left alone at home and it was a plight to notice small kid and dog eating together from the same plate.

Figure 2: Insanitary tube well.

Figure 3: Tea estate markets.

DISCUSSION

Tea industry is one of the oldest industry in the country and the workers involved in plantation are mostly dependant on authority for housing, education, health, water and other needs. However, the working and living conditions, health, education is generally poor.[7] The authority provides housing, water and sanitation services to the permanent employees, but the temporary workers, who are resident of the gardens by dint of their parents or grandparents occupation do not avail such facilities. The residents are dependent on the garden hospital for all kinds of illnesses, but many a times due to shortage of manpower, the hospitals are run by pharmacist without any doctors. They are willing to take the prescribed medicines if it is available in hospital but are reluctant to visit on their own to public facilities when referred as the affected garden too is geographically situated in remote and distant place and moreover loss of wage is another barrier in reaching out.

Cholera is a disease transmitted by faeco oral route directly from person to person or indirectly from contaminated fluid, food or flies perpetuated by presence of other factors like poor hygiene, sanitation or food handling.[8] Practice of open air defecation, open food markets, insanitary rearing of domestic animals, insanitary tube wells with absence of concrete platform at the base, occurrence of diarrhoea at reduced interval throughout the year suggests there is fecal contamination of drinking water, and WASH intervention in the spirit to leave no one behind can be an effective strategy to reduce diarrhoea occurrence in the vulnerable communities.[9] The outbreak of cholera in the present garden also signifies inadequate WASH practice in the lines (hamlets) where the plantation workers reside as the other staff of the garden (Babu lines) who also get similar tube wells, none of them suffered from diarrhoea due to adoption of filtration and hygienic hand washing practices.

Present study demonstrated more females were affected in comparison to males which goes alike to another similar study in a tea garden.[10]

Not only making WASH available, but also a behaviour change to utilize them through public awareness program, targeted health intervention will significantly reduce the endemicity level to less infections.[11,12]

The strength of our study is that it was done at the time of outbreak investigation by the District rapid response team and covered the entire garden. However not all the households could be visited as the investigation was conducted at day time when many of the adults were engaged in their plantation and factory work.

CONCLUSION

Community wide occurrence of cholera in a tea garden occurred due to inadequate availability and utilization of water, sanitation and hygiene practices. To prevent similar episodes in future, provision of potable water, utilization of sanitary practices, hygiene, behaviour change and a hand holding approach among various stake holders may bring an end to this unfinished agenda of cholera in the tea gardens.

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