Original Article

DIARRHEAL DISEASES ROUTINE MICROBIOLOGICAL SURVEILLANCE: AN ANSWER TO RECOGNIZE THE SPECIFIC DIARRHEAL OUTBREAKS

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ABSTRACT

Context: Cholera is an acute diarrheal disease caused by V.Cholera 01(classical or El Tor). Cholera, including the El Tor biotype, may be under-recognized, and many outbreaks are simply recorded as 'diarrhea outbreaks'. Epidemic investigation was conducted to ascertain the extent of problem, possible factors responsible for the occurrence and to institute preventive and control measures.

Methods and Material: A cross sectional descriptive study was planned and a preliminary house to house survey in the village was done to find more cases and then details using a pre-designed questionnaire were taken from those who were having diarrhoea. Comparison was done with the persons not affected with the disease. Sanitary survey was done along with an assessment of environmental findings.Epidemic curve was prepared and attack rate was calculated.

Results: Total 8 persons of varying age and both male and female were found to be ill because of acute gastroenteritis of which one was confirmed for cholera. The symptoms ranged from acute abdominal pain, diarrhoea, vomiting to malaise. The age ranged from 2.5 years to 56 years. The attack rate was 2.79/1000 population. The cases were sporadic and no such congregation of cases was found. Chlorination was not done properly. The chlorine level was 0.2ppm.Insanitation was there in the village.

Conclusions: Diarrhoeal diseases microbiological surveillance is must, as cholera cases go unnoticed and such situations can be a potential threat for resurgence of cholera epidemic, once the environment situations becomes conducive.

Keywords: Cholera, epidemic, gastro enteritis, surveillance, chlorination

INTRODUCTION

Cholera is an acute diarrheal disease caused by V.Cholera 01(classical or El Tor).It is now commonly due to EL Tor biotype. The majority of infections are mild or asymptomatic. Unless there is rapid replacement of fluid and electrolytes the case fatality may be as high as 30-40%.[1] In India, cholera biotype El Tor has almost completely replaced the age old classical cholera.[2]

Clusters of acute diarrhoea are common but investigations are difficult to conduct. Cholera including the El Tor biotype, may be under-recognized, and many outbreaks are simply recorded as 'diarrhoea outbreaks' [3].

Bhalwar R has mentioned that comparison is done of the present rates (or number of cases) with those of corresponding time period of preceding three years. There could also be situations when a single case of a disease may be enough to call for investigations, e.g. a suspected case of plague, or in many of the day to day situations, even a single case of cholera.[4]

The objectives of the present study were to conduct an epidemiologic investigation to ascertain the extent of problem, possible factors responsible for the occurrence. Following the investigations, the things can be planned to institute preventive and control measures.

MATERIALS AND METHODS

Following to the reporting of a single case of confirmed cholera case a cross sectional descriptive study was done in Ardi village is in Anand district in Gujarat state. A preliminary house to house survey in the village was done of all the households in parts supplied by the main overhead water tank covering a population of 2859(that were actually using water tank for drinking purpose) Then the actual cases were approached by the teamand we took detailed history on an epidemiological case sheet Details of diarrhoea during the past 5 days were recorded along with the details of epidemiological data pertaining to age, sex, source of water supply, other eating places visited & disposal of excreta & solid wastes. The study was conducted on the following day but the case finding was done till 14 days (more than double the maximum incubation period for cholera) post reporting of the last case. Epidemic curve was prepared and attack rate was calculated and age range is mentioned.

Ethical approval: As this whole event was a natural event, prior HREC approval was not taken.Human Research Ethics Committee of the college was informed and later one copy of manuscript was submitted also. Informed consent was taken prior to epidemic investigation by the study participants.

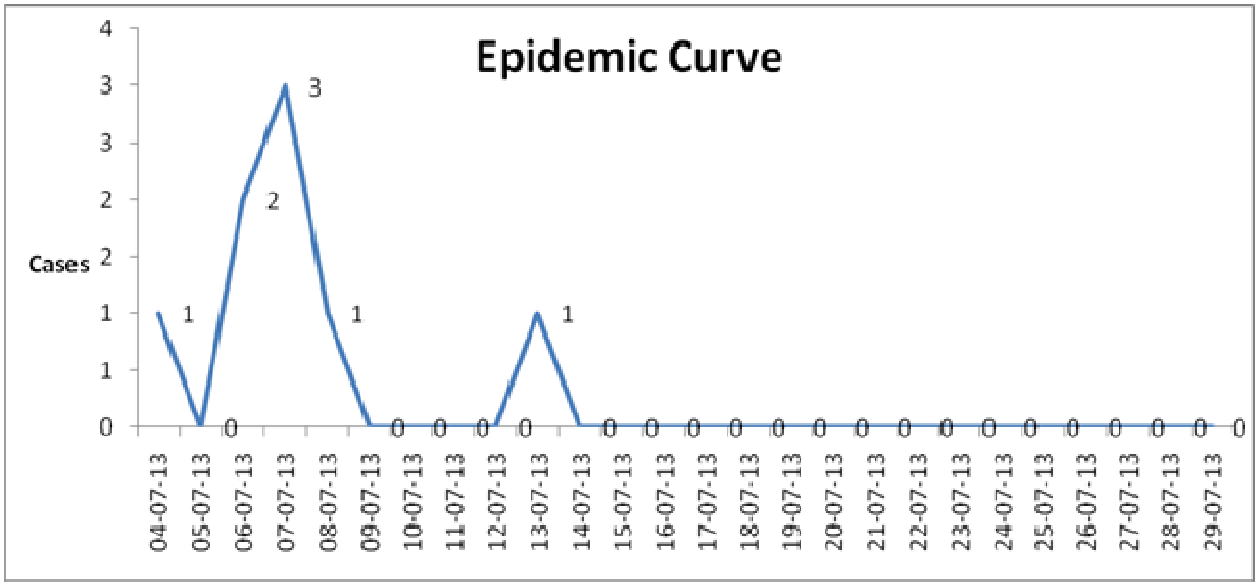
RESULTS

A. Epidemiological Findings-The actual outbreak:

Total 8 persons of varying age groups and sex were found to be ill because of acute gastroenteritis. The symptoms ranged from acute abdominal pain, diarrhoea, vomiting to malaise. The age ranged from 2.5 years to 56 years. The attack rate was 2.79/1000 population. Compared to previous years data there was an unusual increase in incidence. The cases were sporadic and no such congregation of cases was found, even though all had linkage using water from common over head water tank as evident from their history, but the others who didn't had the illness, did use the same water source who actually acted as control in the investigation. We started with the house of the confirmed cholera case. We started taking detailed history of other family members, as the woman confirmed for cholera was in the hospital. No other case of acute gastroenteritis was seen in the family. The case was an ante natal woman. Her case history sheet was seen in the hospital and the detailed history based on epidemiological case sheet was taken in the hospital. History of typical rice watery stools was present. In the hospital investigations, darting motility was seen and so probable diagnosis was put as cholera; else the culture was waited at that time, which actually confirmed later as "Vibrio cholera sero group O, biotype El tor, Serovera Ogawa isolated". On 13th July one of the family members who contacted the illness on 7th July, fell ill because of gastro enteritis. This was the last case of acute gastroenteritis reported and seen in the village. No other case signifying the acute gastroenteritis was seen in the family.Outside eating history was negative for all within past 5 days. In all other cases of diarrhoea, history of typical rice watery stools was not present. . Independent chlorination status was also checked using a chloroscope during the village survey and the same was found to be very unsatisfactory, as it was only 0.2ppm.

Epidemic Curve (Image)

On the day of our epidemic investigation, we found 6 cases that had the illness by that time, but were on treatment and were free of symptoms. Subsequent cases (one each) were found on 8th and then 13th.After 13 no more cases were seen. Overall cases were 8. Peak was seen on the 7th.



B.Environmental factors study

Chlorination status during the village survey was found to be very unsatisfactory as it was only 0.2ppm.The cases were sporadic and distribution by time, place and person were not having any proper linkage (the people were having from the common water tank, but there was no leakage in the line which supplied these areas and contradictory there were no cases where there was an underground leakage).The water may not be the source for the cholera, as from the leakage affected area, not a single case of gastroenteritis was reported. The water supply pipes were intact in areas which had gastroenteritis cases and also one confirmed case of cholera. 2 persons having diarrhoea were using RO water again refutes the probability of drinking water source as the culprit. Travel history, outside eating history was negative in all the cases. Open air defecation is very common in the village (69.7%). conditions; There were abundant house flies in the area because of insanitation. So the house flies can be a possibility of being a carrier arthropod of the disease (both cholera and gastroenteritis).

C.Laboratory Investigations

Laboratory investigation was done only in the notified case which was confirmed for cholera and no investigations of other cases were done as all had taken medicines contacting local physicians and were relieved of symptoms. In the confirmed case serum electrolytes, S.creatinine, Hep-B surface antigen, Histogram was done. Darting motility was checked and further confirmed by culture.

D. Actions takenand suggestions given:

All the gastroenteritis cases were given Tab Doxycycline for chemotherapy as a suspected case of cholera. The contacts in the family were given Tab Doxycycline as prophylactic measure.ORS packets were given and proper preparation technique was demonstrated and cross verified. Chlorine tablets were also given and simultaneously distributed throughout the village. How to use the tablet was properly communicated. The main water pipe from the tank was repaired immediately on the very same day.

DISCUSSION

One case of acute gastroenteritis was confirmed for cholera, as the woman happened to visit the hospital because of diarrhoea complaint and there she was put under laboratory investigations based on the signs and symptoms. This case was the only confirmed case of cholera. As per WHO statement, all cholera cases identified during routine surveillance were confirmed by bacterial culture. However, during outbreaks not all cases of diarrhoea were confirmed in the laboratory, and the WHO case definition: any patient with diarrhoea in an area where culture-confirmed cases of infection with *V. cholerae* O1 or O139 were identified during the outbreak.[7] Everyone had contacted local physicians and were put on treatment for diarrheal complaints. The attack rate was 2.79/1000 population. The attack rate was 9.97/1000 in the study done for epidemiological investigation of cholera outbreak by Thakur JS et al[8] in a peri- urban slum colony in Chandigarh. The others who didn't had the illness, did use the same water source who actually acted as control in the investigation. If the same is seen as case and control point of view then against 8 cases, 2595 persons had used the same water source, but didn't fell ill. The ratio of severe cases to mild or inapparent infections has been shown to be about 1: 5 for classical cholera and 1: 25 to 1: 100 for El Tor cholera. Without the back up of proper laboratory investigations, these acute gastroenteritis cases can't be refuted for cholera seeing to the fact that manifestations in the form of mild symptoms or inapparent infections do occur in El Tor vibrio cholera. Typical history of rice water stool was absent in all other cases than the confirmed one. The cases were very sporadic and no such connection can be made between all these cases except the common water source. Travel history, outside eating history was negative in all the cases. Seeing to all these discussions, the origin and source of the cholera in the village is still unexplainable.The same situation was reported by Das A et al[9]. inParbatia (Orissa) epidemic investigation. In the epidemic investigation by Das A et al[9] in Parbatia (Orissa), for 36% cases, there was not any specific explanation for diarrheal disease. They however hypothesized that towards the second part of the outbreak a certain amount of person-to-person transmission might have occurred. Underground pipe leakage with open air defecation being very common in the village (69.7%) with demanding state of the body (in the confirmed case – Ante natal women), poor nutritional status, poor socio economic status, abundance of domestic flies, overcrowding, poor hygiene, poorly chlorinated water, improper hand washings may be the responsible factor. Trivedi AV et.al[10] also mentioned about the non-availability of safe and potable drinking water, open air defecation and disposal of sullage in an open space. Pardeshi GS et al[11] in her article mentioned about the open air defecation and leakages in the valves and pipes led to water contamination due to back pressure, siphoning or seepage. If only the leakage is to be blamed, then the actual cases were very less; but on the other side there may be many inapparent infection in the village. But still the simultaneous appearance of the these many cases points to the water borne nature of the disease and may be because of seepage from the leaked pipe lines.

CONCLUSION AND RECOMMENDATIONS

As here in this epidemic investigation it was very clear that the case which was confirmed for cholera visited the tertiary care centre and based on the severity of diarrhoea and symptoms; the stool sample was microbiologically examined for cholera vibrio. If the case had not visited the centre, the diagnosis may not have been put for cholera and simply the diarrhoea. As in

El tor cholera, the symptoms vary from mild to severe the improper microbiology investigation will give a misdiagnosis of simply diarrhoea and not the cholera.Diarrhoeal diseases microbiological surveillance is must as cholera cases go unnoticed.

Limitations of the study: An epidemic investigation exercise was carried out in the affected village with an intention to give a clear idea as to what should be done in a case of epidemic and how to conduct such epidemic investigation. The two important limitations in the study were:

1. Stool samples were not taken from the patients as they had already been cured of the symptoms by the time epidemic investigation was carried out.
2. Before water sample was taken, chlorination was already done. So in this case, exact cause was not ascertained.

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