



**EPIDEMIOLOGICAL INVESTIGATION OF HEPATITIS IN A VILLAGE OF
NORTHERN DISTRICT OF BIHAR IN INDIA**

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ABSTRACT

An epidemiological investigation was carried out in village Jhigiyahi, block Motipur to understand the cause and risk factor of the hepatitis outbreak. Based on the initial investigation, consumption of contaminated water was suspected as primary source of infection. The outbreak investigation was carried out in the affected village following basic shoe leather epidemiology. A total of 41 cases fulfilling the case definition were identified in the village. Blood samples were collected from 12 individuals for testing HEP-A (IgM-ELISA) and HEP-E (IgM-ELISA) in the Department of Microbiology of Sri Krishna Medical College Muzaffarpur, Bihar. Out of the total 12 samples tested, 11(91%) cases were found to be positive for Hepatitis-E. The patients were followed in the field till their recovery and further surveys were done to note any subsequent cases in future. Domiciliary treatment was provided to all patients and health education was given to all villagers to avoid any such future outbreaks.

KEYWORDS: Outbreak, Hepatitis, Epidemiological investigation.

INTRODUCTION

Among six viral hepatitis (A B C D E and G), viral hepatitis caused by A and E viruses is the major public health problem in India due its feco-oral mode of transmission. Hepatitis is an inflammation of liver secondary to any cause but is most often encountered following infection with hepatitis virus. As mentioned the outbreak potential is maximum with hepatitis virus type A and E due to its feco-oral mode of transmission.^[1] Worldwide , hepatitis E virus (HEV) affects more individuals as compared to hepatitis A (estimated 20 million vs. 1.4 million).^[2] As there is no effective vaccine and definitive treatment, interruption of transmission is the only best available strategy against viral hepatitis E infection. Through effective Surveillance and early recognition of warning signs, early outbreak investigation, and application of specific control measures would check the spread and also reduce mortality due to the disease. Even Recently the Government of India has launched “National Viral Hepatitis Control Program” on July 28th 2018; it is integrated with control on Viral Hepatitis by 2030 which is also as per SDG^[3] develop linkage with “National Program on Prevention and Control of Viral Hepatitis” establishing laboratory networks, and support capacity-building activities in outbreak investigation. Every year,

numerous outbreaks due to hepatitis virus get reported from across the country. This is a major cause of concern as underreporting can undermine the true burden and negatively influence the implementation of prevention and control activities. In year January 2017, Muzaffarpur district received information of an outbreak of Jaundice through ASHA as well as through the newspaper. The cases were reported in cluster to Chief Medical officer of the District, none of the cases were admitted to any hospital. Thorough outbreak investigation was necessary to understand the epidemiology and explore the reasons behind its occurrence and suggest measures for its prevention in the future. With this objective in mind, we decided to investigate a jaundice outbreak in one of the villages of our field practice area in the state of Bihar, India to understand why each year numerous outbreaks occur in spite of repeated attempts made by the CHC level team taking support of local medical college to investigate and control.

METHODOLOGY

An Epidemiological outbreak investigation of jaundice cases was carried out in Jhingahi village of Muzaffarpur district, Bihar. Based on the initial investigation, consumption of contaminated water was suspected as primary source of infection. Initial investigation was

done by medical officer and his team from the PHC Motipur. In the initial phase of investigation, a meeting with villagers and other stakeholders was conducted for fulfilment of prerequisites and other requirements of the study.

The outbreak investigation was carried out in the affected village following basic shoe leather epidemiology. All standard protocol laid down by government of India for outbreak investigation was followed. A case definition of the health event was constructed using clinical criteria for the setting of this outbreak investigation. Case definition “any case with acute onset of illness (less than 15 days) having following clinical features: Fever with dark urine or yellowish discoloration of the sclera with or without anorexia, vomiting, malaise”. A study tool/case sheet was prepared for collection of data through door to door survey and reviewing of hospital records. The investigating team was made acquainted regarding the format and pattern of survey to be used in the investigation. The data was collected by the field investigators under the guidance of the chief investigator, who trained them on the questionnaire/study tool. The study tool included demographic details of the person interviewed, source of drinking water, habits, condition of the house, and duration of illness alongwith various sign and symptom. All the data collected were entered in

the template made in Microsoft Excel 2013 Excel for further analysis.

RESULTS

The outbreak investigation was carried out in the village-Jhingahi with the support of Medical officer in charge, ANMs, Surveillance Medical Officer and other support staff. First, the team confirmed the outbreak and found that it is an active and ongoing outbreak. The incidence was reported on 10th of January but we cannot identify the index case in the community. The team conducted an active case survey in whole village to confirm the outbreak. The village had total population of 2094 (Male-1054 and Female- 1040) in block Motipur of district Muzaffarpur. Total 41 cases fulfilling the case definition were identified in the village. Blood samples were collected from 12 individuals for testing HEP-A (IgM-ELISA) and HEP-E (IgM-ELISA) in the Department of Microbiology of Sri Krishna Medical College Muzaffarpur, Bihar. The mean age group of the cases was 25 years and range was 7 to 55 years. Out of the total 12 samples tested, 11(91%) cases were found to be positive for Hepatitis-E. The patients were followed in the field till their recovery and further surveys were done to note any subsequent cases in future. Domiciliary treatment was provided to all patients and health education was given to all villagers to avoid any such future outbreaks.

Table1: Independent variable of epidemiological study.

Sr No.	Indicators	Female n(%)	Male n(%)	Total
1	Gender	4(9.8%)	37(92.2%)	41(100)
2	Tobacco	0	14(37.8%)	14(34.1%)
3	Smoking	0	6(16.2%)	6(14.6%)
4	Quality of drinking water (Good)	4(100%)	31(83.8%)	35(85.4%)
5	Sanitaion practice (Using sanitary toilet)	2(50%)	7(18.9%)	9(22.0)
6	Any treatment received	3(75%)	30(81.1%)	33(80.5%)
7	Taking drugs	0	6(16.2%)	6(14.6%)
8	SGPT	1(25%)	16(43.2%)	17(41.5%)
9	CBC	0	1(2.7%)	1(2.4%)
10	Spicy foods	3(75%)	27(73%)	30(73.2%)
11	Serum Billirubin	1(25%)	20(54.1%)	21(51.2%)
12	Is she/he is a BPL card holder	3(75%)	32(86.5%)	35(85.4%)
13	Fever	1(25%)	23(62.2%)	24(58.5%)
14	Vomiting	3(75%)	15(40.5%)	18(43.9%)
15	Abdominal pain	3(75%)	26(70.3%)	29(70.7%)
16	Yellow discoloration to whites of the eye	4(100%)	36(97.3%)	40(97.6%)
17	Yellow discoloration of urine	4(100%)	36(97.3%)	40(97.6%)
18	Clay colour stool	2(50%)	17(45.9%)	19(46.3%)
19	Itching	2(50%)	19(51.4%)	21(51.2%)
20	Weight loss	3(75%)	34(91.9%)	37(90.2%)
21	Fatigue	3(75%)	35(94.6%)	38(92.7%)
22	Jaundice	4(100%)	37(100%)	32(78%)
23	IV infusion	0	5(13.5%)	5(13.5%)
24	Alcohol	0	31(81.8%)	31(75.6%)
25	Paracetamol toxicity	3(75%)	19(51.4%)	22(53.7%)
26	Hospitalization	0	4(10.8%)	4(9.8%)
27	Blood transfusion	0	0	0

Epidemiological analysis	
Mean Age	27
Male -Female ratio	37:4
SD	9.72
% positivity for HepE	91%
Attack rate	0.019

DISCUSSION

The present outbreak is a focal outbreak of hepatitis occurred in Jhingahi village under Muzaffarpur district. The Jhingahi village has schedule caste population and they belong to socio-economic status. Most of the patients belong to worker group. The households in the village has hand pumps which is deep enough (more than 60 feet). The water quality is good and potable none of the village draws water from open well. The age groups of people who are mostly affected meet at one point and drink Taadi (Local alcoholic beverage prepared by juice of palm tree). This drink is very unhygienic and it provides very ambient environment for the growth and propagation of Hepatitis Virus. Normally they don't go for treatment if the cases are one or two especially if it happens to children because community beliefs that like other disease children has to develop Hepatitis (Jaundice). The cases were highlighted because suddenly a group of people in the village developed symptoms of Jaundice along with weakness.

The attack rate was similar to other outbreaks reported from different parts of India (1-15%).^[4] Though it was 20/1,000, it only reflected the tip of the iceberg as usually the ratio of symptomatic to asymptomatic cases ranges from 1:1 to 1:20.^[5] Focus in the knowledge about viral hepatitis is required and this is possible through sustained IEC activities that have to be particularly intensified during the transmission season. Along with this, construction of community toilets and provision of piped water to the villagers could be some of the other community level interventions that may prove to be an effective long-term measure for preventing this kind of outbreak in the future. It is imperative that the village health sanitation committee and panchayat members take an active step forward to mobilize the existing and mostly unutilized funds and tap the available schemes to improve the overall sanitation and hygiene in the villages.

CONCLUSION

There should be awareness regarding Viral Hepatitis among the community and regular IEC for ill effect of consuming alcohol

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Conflict of interest.

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