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A Descriptive Study on the Outbreak of Hepatitis a in Tiruchirapalli , Tamil Nadu July-Sept 2012.

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ABSTRACT

An outbreak of Hepatitis A infection among residents of Melchinthamani (ward 9) in Trichy corporation of Tamil Nadu in July 2012 was investigated using serological and epidemiological methods. Methods: An active door-to-door search was carried out besides initiating a passive surveillance on local laboratories and general practioner. Operational case definition based on the signs and symptoms of cases reported at health facility was used in the surveillance. Blood samples and water samples sent for laboratory investigation. Hypothesis formulated and case control study was done. Excel and epi info were used to draw an epi-curve and to analyze the risk factors. A spot map was also drawn. Results: A total of 62 cases were identified with an attack rate of 6%. Outbreak lasted for four weeks. Females had a higher attack rate (6.6%) than males (4.8%). 23 out of 40 blood samples tested positive for HAV IgM. Fever, high coloured urine, abdominal pain, vomiting and Icterus were the predominant symptoms. Corporation water was the only drinking water source which had nil-very low chlorination levels at various points. Two leaks identified in the water lines had drainage pipe running close to it. Odds of getting Hepatitis. A was significantly higher among those who consumed untreated water (Crude OR 3.008 and adjusted OR 4.1041 p=0.013).Conclusion: Untreated pipeline water would have been the cause of the outbreak

Keywords: Hepatits A, Outbreak, Tiruchirapalli, Common source

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INTRODUCTION

Hepatitis A is a viral disease transmitted enterically and it is prevalent in India, especially among the younger age group [1]. The mode of transmission is primarily through ingestion of contaminated food and/or water (fecal-oral route), which are mostly the common source of infection. The incubation period for Hepatitis A is roughly one month (around 14-28 days) [2]. Hepatitis may occur with limited or no symptoms, but often leads to jaundice, anorexia (poor appetite) and malaise. Hepatitis A commonly present with either of these: Fever, loss of appetite, yellow discolourisation of urine, skin and/or conjunctiva, abdominal pain (Primarily Rt side), vomitting/nausea, body pain and fatigue [2]. HAV infection produces a self-limited disease that does not result in chronic infection or chronic liver disease. However, 10–15% of patients might experience a relapse of symptoms during the 6 months after acute illness. Acute liver failure from Hepatitis A is rare (overall case-fatality rate: 0.5%).

In most developing countries of Asia and Africa Hepatitis A has been highly endemic although a recent survey has reported a decline in the endemicity[3] in relation to improved hygenic standards and socio-economic conditions.

This study was carried out to investigate an outbreak of Hepatitis A in ward 9 0f Tiruchirapalli Corporation of Tamil Nadu, India during July-September 2012.

OBJECTIVES

- Estimate the magnitude of the cluster
- Identify the source of infection
- Propose recommendations for prevention and control of the outbreak

METHOD

Location and area

Tiruchirapalli is geographically located in the center of the state spread over 147 square kilometers. The city is administered by the corporation with 65 wards and four administrative zones. The ward 9 which reported Jaundice cases is located at the southern bank of Cauvery river. The ward has 23 streets, out of which four streets that were in close proximity reported cases of Jaundice. Ward 9 gets its water supply from an Over Head Tank (OHT) situated in Chatiram bus stand with its pumping station at Kambarasanpettai.

Case definition and case finding

Following reports of spurt in the cases of jaundice in ward 9 reporting to local laboratories, dispensaries and clinics, i was instructed to confirm and carry out an investigation of the Jaundice outbreak on the 18th of August 2012. A house to house survey was also carried out with the help of the local health staffs and paramedical students of a local institution. A case was defined as patients who live in ward 9 presenting with history of fever along with either of loss of appetite, abdominal pain, vomiting/nausea, yellowish discolorisation of the conjunctiva, high coloured urine from July 2012. An active search on door-to-door basis was done to identify acute cases. Details of households with recent history (on or after July 2012) of Jaundice were also noted. Simultaneously awareness regarding the illness, ways to prevent it and the need to report of any such occurrence to the health posts were also imparted to the people. Two nearby private laboratories were also instructed to collect data of patients found with High Sr.Bilirubin/ Urine Bilirubin as a part of stimulated passive surveillance.

Case-control study

A total of 43 cases who had high Bilirubin values and/or Hep A IgM positive results were interviewed. Also an equal number of persons who did not have the acute illness, matching the age and locality of the cases, were also interviewed.

Microbiology

Blood samples of patients presenting with acute symptoms or Jaundice were collected and sent to the Government Medical College Hospital in Trichy to test for Hepatitis A, Hepatitis E and Leptospirosis.

Environmental survey

The ward 9 has 23 streets. With the co-ordination of corporation staffs, sanitary workers and corporation health staffs the streets were inspected to look for any contamination in the water supplying pipes. Also a general awareness was created among people to report to the health posts if any of the acute symptoms develop. Water supply is done on a daily basis from around 4.00AM to 8.00AM. The water is purified by Gas Chlorination at the pumping station and then distributed to the OHT's.

RESULTS

Descriptive Epidemiology

A total of 87 cases who matched the case definition were detected in ward 9. Total of 71 cases of Hepatitis A were identified through active survey in 8 streets of Ward 9 (attack rate: 1.07) and 16 cases were obtained from the local laboratories through stimulated passive surveillance. Out of it 80 cases were below 20 years of age (91.95%). While 12 cases were detected in the age group of 0-5 years (13.79%), 68 cases were detected in the age group of 6-20 years of age (78.16%). [Figure: 2] Cases were distributed mainly among three streets of ward 9 with the majority of cases occurring in SS Koil Street (6.86%) [Figure: 1]. Majority of the patients (97.33%) took native treatment on diagnosis for Hepatitis A. There was no hospitalization of cases and no mortality. Baring one case each on 18th, 21st and 23rd of July, the spurt in the number of cases developing symptoms had occurred from 1st August to 28th August. After which there has been a decline with one case reporting on 24th,26th,27th and 29th of August. Besides fever (93%), the common symptoms among the cases included vomiting (88%), Loss of Appetite (81%), and myalgia (72%). The local laboratories had reported that they had cases reporting with high Serum Bilirubin until the 6th of September but details about their address and date of onset of symptoms couldn't be obtained. A total of 73 out of the 75 cases took native treatment. There had been no hospitalization of cases and nil mortality.

Microbiology

A total of 8 blood samples were tested for Leptospirosis and all turned out to be negative.
A total of 40 samples were tested for Hepatits A and E IgM, out of which 23 came positive for Hepatitis A IgM (Kit Name: HAV Rapid 1; Insight HAV IgM)

Environmental survey

The corporation drinking water had chlorination levels varying from low to nil at different collecting points. Inspecting for leaks at joints and at places where the water and drainage pipes are in close proximity revealed leaks. Also, interview with local people revealed that following a road laying work that had happened a month ago they had dark coloured foul smelling water for a couple of days. Many though couldn't recollect about the smell or colour of water when asked about its characteristics for the past one month. Open defecation was visible in the footsteps at the bank of the river located near the SS koil street which incidentally had children playing around.

Almost every household in these streets used corporation water as their only source of drinking water.

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Table 1: Street wise attack rate of Hepatitis A in ward 9 of Trichy Corporation during July-September 2012

Street	Cases (N=62)	Population	Attack Rate
Kosamettu Street#	14	297	4.71
MK Agraharam*/#	14	288	4.86
SS Koil Street#	34	495	6.87

* MK Agraharam alos includes Nadu Agrharam
# Cases more than 20 yrs of age have not been included

Table 2: Age wise attack rate of Hepatitis A in ward 9 of Trichy Corporation during July-September 2012

Age	Cases	Population	Attack Rate
0-5 years	9	317	2.83
6-20 years	52	763	6.81

DISCUSSION

This outbreak of Hepatitis A had started in the 1st of August and had its peak in the first and second week of August. The distribution of cases concentrated among the four streets of the ward which are in close proximity and the history of foul smelling, dark coloured water about a month back and identification of leakage add strength to the hypothesis that this outbreak of Hepatitis A would have been caused by the common source, that is drinking water, which is commonly used among everyone. Further there had been no mass gathering that happened in the locality in the past two months involving local residents. Although everyone in the region have been equally exposed to the same drinking water, the fact that only a certain number of people got the disease manifestation can be attributed to the individuals immunity level, dose response and also that this infection is bound to have sub-clinical manifestations that are also self-limiting. The age group of cases that have manifested with the disease adds strength to the argument [3].

Recommendations

The fact that the spurt of cases had occurred in the first two weeks of August and the whole machinery was available in the end of second week authenticates the need for a better surveillance mechanism to be in place and to improve the existing surveillance system.

The low to nil chlorination levels at various water drawing points necessitates the need to have stricter monitoring and inspection of chlorination on a daily basis. The sanitary inspectors should be adequately posted to man the wards. The fact that nearly 100% of the residents use corporation water for drinking and 70% of those interviewed do not use any water treatment (boiling/RO treatment) before drinking makes it necessary to create awareness among the people on the need to drink boiled water.

The less co-operation extended by the local laboratories who were reluctant in spite of requests made by the local Urban Health Nurse to collect address/ phone number of patients reporting with high Sr.Bilirubin/ Urine Bilirubin levels must be adequately addressed so that this does not re-occur in the future.

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Fig 1: Outbreak of Hepatitis A In Tiruchirapalli Corporation, Tamil Nadu July-September 2012

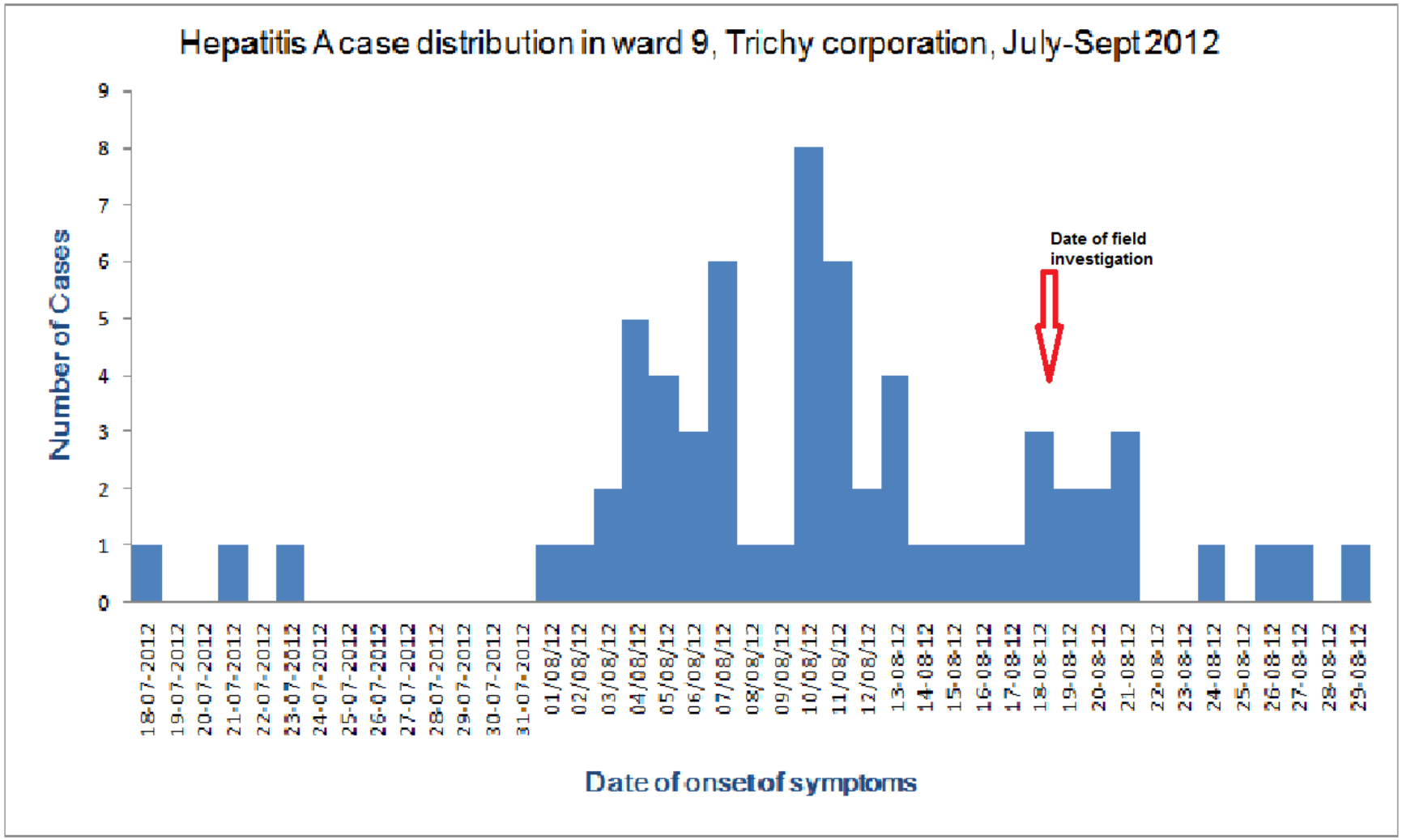

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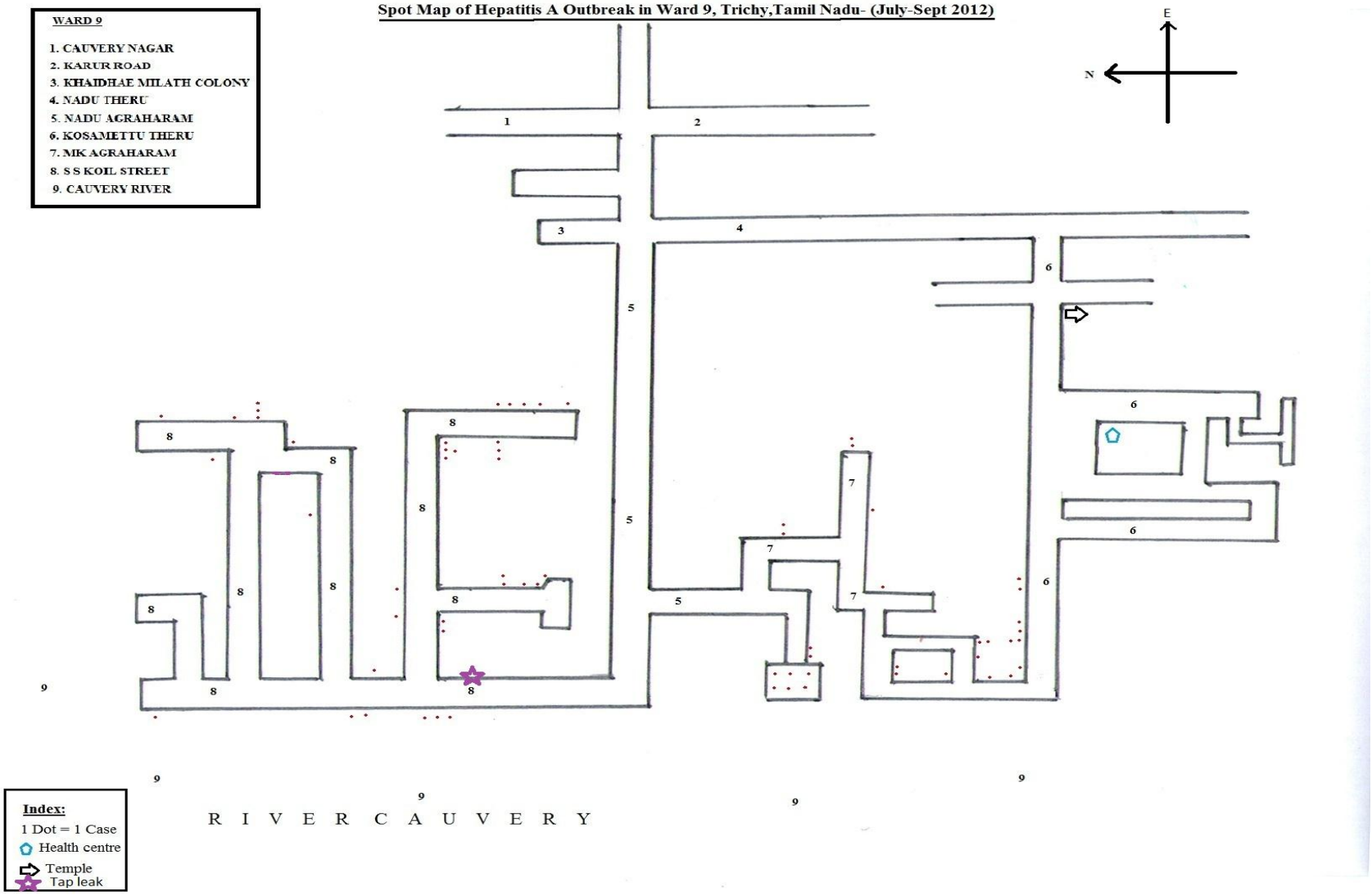
Fig 2: Spot map of Hepatitis A outbreak cases in Ward 9 of Trichy Corporation, Tamil Nadu (Jul-Sept 2012)



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