Transmission Of Hepatitis E In A Group Of Homosexuals In A Village Of North India

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Citation

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Abstract

Background: The article reports transmission of hepatitis E in a closed group homosexual.

Objective: To ascertain the mode of transmission of Hepatitis E

Methods: A house-to-house survey was done in the village from where an index case of jaundice was reported. Blood sample of jaundice cases, healthy family members were tested for antibodies. In depth interview of the affected cases were also done.

Results: Seven jaundice cases were detected in the village (Population 1149). All were positive for HEV IgM and IgG, but were negative for HIV, VDRL, HBsAg, Anti HCV, and HAV IgM. All healthy controls were negative for HEV IgG and IgM. All cases were member of a male homosexual group and were aged 15-25 years. History of use of saliva as lubricant during anal intercourse was elicited.

Conclusion: The hepatitis E outbreak in the affected group was probably due to faeco oral transmission facilitated by peculiar homosexual practice.

INTRODUCTION

Hepatitis E (HEV) has been reported to have multiple routes of transmission eg faecally contaminated water[1,2,3,4], person-to-person [5, 6], faecally contaminated foods[7, 8], or transplacental[9]. There are some reports on sexual mode of transmission of hepatitis E also[10, 11, 12]. However no data is available from endemic areas like India on this aspect. Present study describes a series of hepatitis (HEV) cases in an active group of male homosexuals from north India.

On 4th February 2005, a 24-year-old male reported at the OPD of a government general hospital with complaints of loss of appetite, yellow discoloration of skin/eyes/urine and pain in abdomen. He was provisionally diagnosed as a case of hepatitis by the principal investigator (PI), a senior resident doctor from the School of Public Health, Post Graduate Institute of Medical Education and Research, (PGIMER), Chandigarh, India. Enquiry revealed existence of two more cases of jaundice in the village of the index case. Against this background the investigators decided to ascertain the cause of the jaundice outbreak in the village. Present article briefly describes the results obtained.

MATERIAL AND METHODS

A five-member team of three doctors and two health workers was constituted to investigate the nature of jaundice outbreak. Health workers were trained for data and sample collection techniques. The team first discussed the problem of jaundice and its consequences with the village headman (Sarpanch). His consent was obtained to investigate the problem in the village. Informed written consent was also taken from the cases and or their parents for the outbreak investigation. After that, a quick house-to-house survey was conducted in the whole village. Cases were line listed and a spot map was prepared to indicate their geographical location. History of participation in any common food party, blood donation or blood transfusion was sought.

A sanitary survey was carried out to detect any leakage in water supply pipes. A field measurement of residual chlorine in drinking water was done using simple commercial colour-match comparators (Orthotolidine Test). Water samples were collected for different consumption sites for

bacteriological analysis using standard methods and transported within 12 hours to microbiology laboratory in PGIMER, Chandigarh. Most Probable Number (MPN) was calculated for presumptive test for coliform in the water samples.

Blood samples were drawn aseptically by venepunture from the cases as well as at least from two apparently healthy members of the families of the affected cases. The clotted blood samples were transported in an icebox to the Virology department of PGIMER. Serum was separated from these samples by refrigerated centrifugation at 3000 rpm for 10 minutes. Aliquots were made and stored at -80°C for further analysis. In addition, blood samples from apparently healthy males of the same age group not involved in the homosexual activity were also obtained.

Because of the involvement of homosexual group in the jaundice epidemic samples were tested for parenterally transmitted hepatitis i.e. hepatitis B virus (HBV) and hepatitis C virus (HCV). Involvement of hepatitis E virus was considered by exclusion criteria. Thus, all the samples were tested against hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), and hepatitis E virus (HEV) parameters by micro ELISA kit with a high specificity and sensitivity. Acute blood samples could be obtained from two of the seven patients and subjected to reverse transcriptase nested polymerase chain reaction (RT-nPCR) using the standard protocol with minor modification[13]. 'Comb Aids Kit' was used for HIV antibody test.

A case was defined to be suspected if there was acute illness compatible with jaundice, fever preceding jaundice, epidemiological link or outbreak in the area of residence of case. Suspected case with laboratory test positive for IgM anti HEV antibody were defined to be confirmed case of hepatitis E.

During initial part of investigation it was apparent that all the reported jaundice cases were members of a local male homosexual group. Judging the sensitive nature of investigation, qualitative research methodology was adopted to gather the relevant data. Two of the affected cases were subjected to in-depth interview by the PI. Affected homosexuals were interviewed for type and frequency of sexual exposure, use of condoms and lubricants during the act. The information were recorded on a proforma designed for the study which included informations on patient's identification, sociodemographic data, clinical history, physical examination, investigation, and living conditions (drinking water supply, excreta disposal, house cleanliness etc.)

RESULTS

Out of the total village population surveyed (1149 persons in 175 houses) only 7 patients of jaundice were found. All were positive to HEV IgM and IgG but were negative for VDRL, HIV, Australia antigen (HBsAg), Anti HCV antibody and HAV IgM. None of the 15 apparently healthy controls was positive to any of the infections tested including the HEV IgG antibody. Of the two acute blood samples, one was positive for HEV RNA by RT-nPCR (Figure 1), using primer from the ORF1 region with an amplified HEV specific product of 343bp visualized in 2% agarose gel electrophoresis, thus confirming the HEV etiology in the study individuals. Total serum billirubin of cases ranged from 2.0-15.2 mg%.

Figure 1

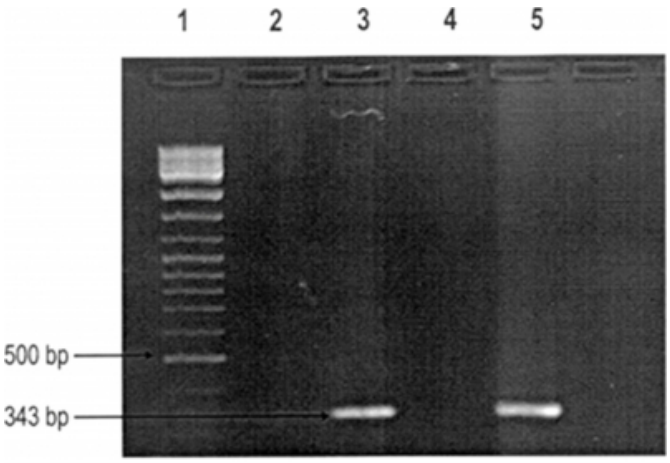

Fig. 1: 2% Agarose gel electrophoresis:

Lane1: 100 bp Mol. Marker
Lane2: Negative control
Lane3-4: Acute patient sample
Lane5:ORF-1 Positive control

All seven cases of hepatitis were males; aged 15-25 years with history of homosexual relationship with each other within the group. This closed group comprised of a school teacher (24 years), three students, and the driver of a school bus, an unqualified local medical practitioner and an unemployed boy from the village. The houses of the victims were in close proximity to each other. Each case had indulged in homosexual activity with each other on more than one occasion. None of them ever used condom or any barrier protection during sexual intercourse. All of them gave history of use of saliva as lubricant for sexual act. Licking of fingers was used for applying saliva on anal

orifice.

Clinically all cases had fever, pain in abdomen, yellow discoloration of urine and loss of appetite. No other case of jaundice was found in the families of the affected cases. No history of common food party exposure was there. None of the sample was positive for coliform bacilli, all were declared fit for human consumption. Fifty water samples were tested for residual chlorine on the spot with OT test, all the samples were positive for OT (Ortho- Tolidine) Test.

DISCUSSION

The epidemiological and laboratory investigations suggest that the seven jaundice cases in this study were due to hepatitis E virus (HEV). Our results exclude the possibility of contaminated water as a source of transmission. None of the affected members had attended any common food party in last three months indicating that food might not be the source of present outbreak of HEV. In the present study, all the healthy family contacts of these males were negative for HEV antibody. This excludes the possibility of intrafamilial spread of HEV. It is generally believed that hepatitis E virus is not transmitted through the percutenous route such as transfusion of blood or blood products[10] but few reports from Germany and Greece suggested that HEV infection may be transmitted by routes similar to those of hepatitis B and C viruses[14, 15].However, there was no history of any recent blood transfusion or parental administration of blood products in the jaundiced cases. So blood borne route was also excluded.

Exclusive occurrence of jaundice in a closed group of homosexual males in this study indicated the possibility of sexual transmission. Thomas et al[16] reported that anti HEV antibodies were found in 15.9% of homosexual men. Montella et al[12] had also reported that HEV antibodies were found in 33 of 162 homosexual men (20.4%). But HEV essentially is water borne infection. How do we explain its occurrence in a group of male homosexuals? The answer was provided by in depth exploration of the sexual practices of this group through qualitative research. None of the cases used condom during the sexual act. All had exclusively engaged in homosexual activity except one who was bisexual. During intercourse the member of this homo sexual group used saliva as a lubricant. Possibly faeco oral transmission of HEV was facilitated by this practice. First the person concerned spat on his fingers and applied this saliva on the anal orifice of the ‘passive partner'. Then he licked his fingers again to apply more saliva on anal orifice. This process was repeated three to four times. Probably this practice led to contamination of hand and fingers by faecal remains. The contaminated fingers then possibly transmitted HEV through mouths of ‘active partners'. Whether the route of transmission was actually sexual i.e. through mucosal tear of rectum, penis or faeco oral as suggested above is open to question. However, faeco oral transmission facilitated by homosexual practice seems to be the most plausible mode of transmission. This finding has been supported by other reports on the transmission of enteric protozoa and helminthes among the homosexuals through oro rectal contact[17].

Thus, this study highlights the need to generate awareness among the homosexuals on the safe sexual practices (use of condoms/safe lubricants).

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