

Insignificant prevalence of antibodies to hepatitis C in a rural area of western Maharashtra

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Objective: To determine the age-specific seroprevalence of hepatitis C virus (HCV) in a rural population in Maharashtra. **Methods:** 1054 serum samples collected from apparently healthy persons were tested by recombinant immunoblot assay for antibodies against HCV (anti-HCV). Anti-HCV positive samples were tested for HCV-RNA by nested reverse transcriptase polymerase chain reaction (RT-PCR). **Results:** One man tested positive for anti-HCV; his sample was also HCV-RNA positive. **Conclusions:** HCV infection is infrequent in this rural area in Maharashtra. [*Indian J Gastroenterol* 1999;18:22-23]

Key words: HCV antibodies

Epidemiological studies for the detection of antibodies to hepatitis C virus (anti-HCV) have been carried out all over the world.¹ Data from India are limited.²⁻⁵ Studies conducted so far in our country have mostly been restricted to patients suffering from hepatitis and voluntary blood donors. The only report describing age-stratified prevalence of anti-HCV antibodies in an urban healthy population is from western India.²

Since a large proportion of our population lives in rural areas and information about HCV exposure is lacking among them, we undertook a study to determine the prevalence of HCV in them.

Methods

Blood samples were collected from 1054 apparently healthy persons (6.6% of population) from four villages of Bhor Taluka in Pune district, with a total population of 16,000. The samples were taken during an ongoing surveillance for hepatitis viruses in this area in 1995. The sample size was determined with a confidence limit of 95% tolerating an error of 0.2%. Relevant history was taken from each individual on a preset proforma. Besides demographic information, history of previous episodes of jaundice, blood transfusion, operations, parenteral therapy, hospitalization, visit to dentist, intravenous drug abuse and other major illnesses was elicited. The study population (502 males) included 602 children attending primary and secondary schools and 46 pregnant women (aged 15-31 years) attending antenatal clinics at primary health centers; the other 406 adults of different ages were selected at random. Sera collected were stored at -20°C until testing.

All samples were tested for anti-HCV antibodies em-

ploying a third generation immunoblot assay (RIBA 3.0; Chiron, USA) as per the manufacturer's instructions. The RIBA 3.0 test is a 4-band assay employing two recombinant antigens (C33C and NS-5) and two synthetic peptides (C22 and C100) representing nonstructural and core regions of the HCV genome.

The anti-HCV positive sample was tested by nested RT-PCR. RNA was prepared according to the guanidium-phenol-chloroform method. The primers employed represented the highly conserved 5' noncoding region.⁶

Results

Four per cent of children (<15 years of age) gave past history of jaundice; 1.5% had history of operations, hospitalization, dental procedures or parenteral therapy and 0.2% had received blood transfusions. Among adults, 13.7% had a past episode of jaundice, 7.6% had history of operations, hospitalization, parenteral therapy or visit to the dentist; 0.3% had received blood transfusions. None gave a history of IV drug abuse.

Only one of 1054 samples screened was anti-HCV positive (confidence interval 0%-6.5%) (Table). This was from a 52-year-old man. This person had not suffered from jaundice in the past, nor had history of blood transfusion, parenteral therapy, hospitalization,

Age group	No. positive / No. tested
<10 years	0/556
11-20 years	0/168
21-30 years	0/109
31-40 years	0/73
41-50 years	0/57
>50-years	1/45
15-31 years (pregnant women)	0/46
Total	1/1054

or visit to a dentist. This sample tested positive for HCV-RNA by PCR. Blood samples from four of his family members were found to be anti-HCV negative.

Discussion

Exposure to HCV was uncommon in this rural population of western India. In a previous study² we had reported that prevalence in the healthy population of urban areas of Pune was also low (1/830). Thus, HCV infection among populations in and around Pune city is uncommon.

Intravenous drug abuse was not prevalent in our study region; the practice of invasive methods of medicine is relatively infrequent in rural areas of India. Hence, the risk of acquiring HCV by invasive/parenteral methods in these areas is low.

Our findings are consistent with those in Cameroon⁷ where the prevalence of anti-HCV antibodies among healthy persons in rural and urban areas was not different. When compared to urban populations a significantly higher anti-HCV positivity among certain rural populations was observed in the UK⁸ due to high IV drug abuse in these rural areas. Similarly, in Japan,⁹ increased HCV exposure in rural areas was attributed to improperly sterilized acupuncture needles. In another study¹⁰ higher anti-HCV positivity was noticed among patients receiving parenteral therapy from particular clinics in rural areas of Japan.

In contrast to the low anti-HCV positivity among civilians from Pune, the prevalence was 2.3% among healthy recruits to the Indian armed forces from all over India.⁵ Studies conducted in central³ and north⁴ India showed anti-HCV prevalence of 1.8% and 1.5%, respectively among voluntary blood donors; 1.5% of pregnant women were anti-HCV positive.⁴ Second generation ELISA was employed in both studies; this test is known to give false-positive results especially among low-risk populations. In the present study, RIBA 3.0, which is a confirmatory assay, was employed.

Ours is the first study conducted in a rural population in India. Similar populations from different parts of India need to be examined to obtain a comprehensive picture of HCV infection in rural India.

References

1. Choo QL, Weiner AJ, Overby LR, Kuo G, Houghton M. Hepatitis C virus: the major causative agent of viral non A, non B hepatitis. *Br Med Bull* 1990;46:423-41.
2. Arankalle VA, Chadha MS, Jha J, Amarapurkar DN, Banerjee K. Prevalence of anti HCV antibodies in western India. *Indian J Med Res* 1995;101:91-3.
3. Jaiswal SPB, Chitnis DS, Naik G, Artwani KK, Pandit CS, Salgia P, *et al.* Prevalence of anti HCV antibodies in central India. *Indian J Med Res* 1996;104:177-81.
4. Irshad M, Acharya SK, Joshi YK. Prevalence of hepatitis C antibodies in the general population and in selected groups of patients in Delhi. *Indian J Med Res* 1995;102:162-4.
5. Ohri VC, Rao MKK, Banerjee K, Raghunath D, Kher SK, Gupta RM, *et al.* Prevalence of antibodies to hepatitis C virus in hospitalised population subsets. *Med J Armed Forces India* 1997;53:3-6.
6. Okamoto H, Okada S, Sugiyama Y, Tanaka T, Sugai Y, Akahane Y, *et al.* Detection of HCV RNA by two stage polymerase chain reaction with two pairs of primers deduced from the 5' non coding region. *Jpn J Exp Med* 1990;60:215-22.
7. Mencarini P, De Luca A, Antinori A, Maiaro G, Spedini G, Bailly C, *et al.* Prevalence of anti HCV antibodies in Cameroon. *Trans R Soc Trop Med Hyg* 1991;85:654-5.
8. Majid A, Holmes R, Desselberger U, Simmonds P, McKee TA. Molecular epidemiology of HCV infection among intravenous drug users in rural communities. *J Med Virol* 1995;46:48-51.
9. Nakashima K, Ikenatsu H, Hayashi J, Kishinara Y, Mitsutake A, Kashiwagi S. Intrafamilial transmission of HCV among the population of an endemic area of Japan. *JAMA* 1995;274:1459-61.
10. Hayashi J, Kishihara Y, Yamaji K. Transmission of hepatitis C virus by health care workers in a rural area of Japan. *Am J Gastroenterol* 1995;90:794-9.

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