



BRIEF COMMUNICATION

## Hepatitis C virus infection during pregnancy in North India

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### KEYWORDS

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Hepatitis C virus (HCV) is responsible for 20% of cases of acute viral hepatitis and nearly 50% of cases of chronic viral hepatitis [1]. Most persons acutely infected with HCV will develop a persistent infection and nearly 70% will experience chronic necroinflammation of the liver [1].

Information concerning potential risk factors for HCV infection is provided by studies conducted on blood donors, on patients with chronic liver disease and on individuals with a history of intravenous drug use. The present study aims to assess the seroprevalence of anti-HCV antibodies in healthy asymptomatic pregnant women from the Indian subcontinent.

A total of 1900 asymptomatic pregnant women were recruited randomly from the antenatal clinic between August 2003 and April 2004. Their mean  $\pm$  S.D. was  $24.05 \pm 4.06$  years, and their mean height and weight were  $1.53 \pm 0.03$  m and  $54.16 \pm 9.54$  kg. Women with preexisting liver disease were excluded from the study. K.A.S. and R.K.G. collected detailed demographic and clinical profiles in a predesigned, pretested fashion. The institution's ethics committee approved the study.

A blood sample was collected for the detection of anti-HCV antibodies by third-generation enzyme-linked immunosorbent assay diagnostic kits (SP-NANBASE C-96 3.0; General Biological Taiwan). To decrease the rate of false positivity, the initially reactive samples were retested in duplicate. The assay was considered positive if at least two of three results were reactive. The affected women were informed of the positive results and counseled accordingly.

Fourteen of the 1900 asymptomatic pregnant women tested positive for anti-HCV antibodies (95% confidence interval: 0–1.79%).

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An increasing trend in the prevalence of seropositivity was observed with increasing age until women reached 29 years (Table 1). The seropositivity rate among women in their first or second pregnancy was 0.48%, whereas it was 1.60% among pregnant women in their third or fourth pregnancy. The seropositivity rate, which was 0.62% among illiterate women, increased with increasing literacy status and reached 1.05% among the women having more than 10 years of education (Table 1). A further breakup of these data revealed an anti-HCV antibody positivity of 1.2% among college graduates ( $P>0.05$ ). None of the women with a history of congenital malformation, stillbirths, preterm labor, diabetes or hypertension were found to be seropositive.

Table 2 presents the prevalence of risk factors for HCV infection in the study population, which showed no history of homosexuality, multiple sexual partners or intravenous drug use.

To the best of our knowledge, this is the largest study demonstrating the prevalence (14 of 1900 [0.73%]) of anti-HCV antibodies in asymptomatic pregnant women from the Indian subcontinent. The absolute number of only 14 positive cases precludes the detection of small differences in the prevalence of risk factors; however, the prevalence of anti-HCV antibodies has been reported to increase with age and to be the highest among women older than 40 years [2].

Tattoos and body piercing are potential risk factors for HCV infection, particularly when carried out by “backyarders”, or practitioner not adequately trained in infection control procedures [3]. There is a slightly increased risk of anti-HCV seropositivity in individuals with a history tattooing (odds ratio: 1.30) and dilation and curettage (OR: 1.52), which suggests a blood-borne mode of transmission. Unsteri-

**Table 1** Characteristics of 1900 asymptomatic pregnant women seropositive for anti-HCV antibody in India

Characteristic	Total no. of women	No. of seropositive women
<i>Age, years</i>		
15–19	360	2
20–24	1007	8
25–29	440	4
30–39	93	0
<i>Gravity, no.*</i>		
1–2	1462	7
3–4	438	7
<i>Years of education, no.*</i>		
None	480	3
1–10	1031	7
>10	378	4
<i>Religion*</i>		
Hindu	1325	9
Muslim	575	5

\*  $P>0.05$ .

**Table 2** Prevalence of risk factors among 1900 asymptomatic pregnant women seropositive for anti-HCV antibody in India

Risk factor*	Total no. of women	No. of seropositive women	Odds ratio (95% confidence interval)
<i>Smoking</i>			
Yes	3	0	
No	1897	14	
<i>Chewing tobacco/pan</i>			
Yes	8	0	
No	1892	14	
<i>Acupuncture and/or tattooing</i>			
Yes	215	2	1.30 (0–6.2)
No	1685	12	
<i>Use of oral contraceptive pill</i>			
Yes	35	1	4.2 (0.01–32.2)
No	1865	13	
<i>Dilation and curettage</i>			
Yes	186	2	1.52 (0–7.3)
No	1714	12	
<i>Surgical procedures</i>			
Yes	220	1	0.57
No	1680	13	

lized medical equipment is likely to be an important risk factor, responsible for a prevalence rate greater than 20% in parts of Egypt [4]. Positivity for HCV antibody in women is independently associated with intravenous drug use. The risk of contracting hepatitis C through sexual intercourse is unclear, but having or having had a sex partner with a history of multiple sex partners may represent a potential risk.

Intravenous drug use, multiple sexual partners and homosexuality are presumed to be uncommon in Indian society, particularly among women. However, these issues are not often discussed, probably because of social inhibitions.

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