



A study on the distribution of Hepatitis B and C viral markers in the Weaver's community of Tamil nadu state, India

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Abstract

Plan

To study the distribution of Hepatitis B and C viral markers among the weavers population from Kanchipuram, Erode and Tiruvannamalai Districts of Tamil Nadu.

Methodology

Medical camps were organized in three districts (Kanchipuram, Erode and Tiruvannamalai) based on information about the weavers population who live in these localities. Three hundred and two blood samples were collected non-randomized and screened for Hepatitis B surface antigen (HBsAg) and Anti HCV by ELISA.

Outcome

HBsAg positivity rate of Kanchipuram District was (3.09%), Erode District (2.04%) and Tiruvannamalai District (1.88%) HCV positivity was observed in one person only in Tiruvannamalai District (0.94%). There was no significant association between age, gender and the incidence of HBV and HCV positivity ($p \geq 0.05$ at 5% confidence). The percentage of HBV (HBsAg) and HCV in the weaver community is similar to the general population.

Key words: HBV, HCV, Weaver community.

1. Introduction

Hepatitis B virus and C viruses are the most important aetiologic agents of viral hepatitis. Hepatitis B virus infection is a global health problem. There are nearly 350 million people chronically infected with HBV. However the prevalence of infection varies between different countries. A large number of studies on the epidemiology of HBV infection have been carried out and India falls in the intermediate zone with around 3-4%.



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The carrier rate of Hepatitis B in India varies across the country.^{1,2} HBV is an important cause of liver disease in India, leading to 42% of acute hepatitis, 68% of chronic hepatitis 80% cirrhosis and 61% of hepato-cellular carcinoma.

The important aspect of in the epidemiology of HBV is the age of acquiring the disease³. The most important mode of transmission in the community is the unsafe injection practices prevailing in the vast rural areas of the country. However intravenous drug use and sexual mode forms the major modes of infection among adults. Horizontal transmission of HBV is more common than perinatal transmission in India. Acquiring the infection in early childhood is due to crowded and unhygienic conditions⁴.

Similar to Hepatitis B, Hepatitis C virus is also another common aetiological agent for cirrhosis of the liver. It is the commonest blood borne infection leading to liver transplants. Hepatitis C can present as acute or chronic hepatitis. The worrying aspect of HCV infection is that the majority of the infections are asymptomatic and the symptomatic acute hepatitis with jaundice is seen only in 25%. However nearly 54% - 86% of the infected individuals progress to chronic hepatitis which is a matter of concern⁵. Chronic hepatitis may lead to cirrhosis and hepatocellular carcinoma. The global prevalence of Hepatitis C infection is around 2% with 170 million chronic infections⁶. Transmission of Hepatitis C virus is strongly associated with intravenous and percutaneous drug and needle use and blood transfusion and unsafe needle infections.^[7] This virus is the cause of post-transfusional hepatitis and sexual transmission remains unclear. Dialysis and renal transplants are also important risk factors for acquiring infections. Most studies of the HCV prevalence are from the blood banks, general population and other occupational groups.

Weaving in India is considered as one of the largest cottage industry. Weaving industry has been one of the most promising sectors of huge employment in rural areas next to agriculture. Handloom weavers alone comprise 33% of the industry in which more than 40% are women. Despite the government's continuous efforts regarding their welfare, this section is socio economically backward, education and access to health information is limited to these people.

The existing literature indicates that though many studies have been done on allergies and occupational respiratory diseases pertaining to the weaving community^{8, 9, 10}, but no study has ever been attempted on their health status with respect to HBV and HCV viral infections. Therefore this study would be particularly a pioneer work in the hitherto unexplored Weavers population for the Hepatitis B and Hepatitis C viral markers.

2. Materials and Methods

2.1. Study Population

The study population comprised of 302 weavers belonging to the three districts of Tamilnadu viz. Kanchipuram, Erode and Thiruvannamalai. (Fig. 1) The subjects were exclusively handloom weavers belonging to the cooperative society and working under the government of Tamilnadu. Ethical clearance was obtained from the Institute ethical committee of Life Teck Research Centre, Chennai -600 026, Tamil Nadu State, India.

2.2. Specimen collection

Medical camps were conducted during November 2009 and October 2010. Serum samples were collected and were non randomized. Written consent was obtained. Interviews were done using a questionnaire and the procedures were explained. 5 ml of venous blood was collected and serum plasma separated and transported in dry ice and stored at minus 20° C. Serum samples were screened for HBsAg and anti –HCV antibodies using commercially available ELISA kits. (HBV: HBsAg (ELISA): Abbot, Murex, Dartford U.K. HCV: Anti HCV (ELISA): Murex, Biotech, Kyalami, South Africa).

2.3. Exclusion Criteria

Subjects below 18 years were excluded from the study.

3. Results

Hepatitis B

The Hepatitis B virus (HBsAg) carrier rate in weaver community was 3.09%, 2.04% and 1.88% in Kanchipuram, Erode and Thiruvannamalai respectively.

The positive cases were in the age range of 31-70 in Kanchipuram and Erode, and male predominance was observed in Kanchipuram (4%) and (4.4 %) in Erode (Table-1-2, Fig. 2).

On the other hand in Thiruvannamalai district, the positive cases were in the age group of 51- 80 (Table-3) and the females showed predominance (3.33%).

Hepatitis C

All the samples tested for HCV anti-antibodies tested were negative in Erode and Kanchipuram districts. However in Tiruvannamalai district the only one female weaver was positive for HCV(0.94%).

Statistical analysis

The data was analyzed by Chi square using SPSS 13 software package to find out the association of age group and gender for Hepatitis B and C positivity. There was no significant association of Age, Gender and HBV and HCV positivity in the weaver population of all three districts (Table-4).

4. Discussion

The present study, which is done in the Weavers community of Tamilnadu, is a pioneer work. Prevalence study of HBV and HCV infection has been done in many groups like sex workers, voluntary and professional blood donors, pregnant women, tribes, health care workers, children and some industrial populations but not in the weavers community so far in India.

The carrier rate of Hepatitis B in India varies across the country. The highest prevalence reported is among aborigines of Arunachal Pradesh (21.2%).¹¹ Excluding the high risk group the point prevalence in non-tribal group is 2.4% and tribal population is 15.9%. The chronic HBsAg carrier rate in the country among non-tribal population is 1.9%,¹² and in South India the reported prevalence rate is 5.5%¹³.

The prevalence of HBs Ag is 3.09%, 2.04% and 1.88% in Kanchipuram, Erode and Tiruvannamalai respectively as revealed by the present study. Prevalence of HBsAg over age distribution of study subjects was similar in Kanchipuram and Erode 31-70 years. On the other hand in Tiruvannamalai positive cases were in the age range of 51-80 years. This may be due to the fact that in Kanchipuram and Erode people enter into the weaving profession at an early age.

Male predominance was observed in Kanchipuram and Erode. On the contrary positivity was present only in the female population (3.33%) in Tiruvannamalai. However when statistically analyzed, the disease pattern was not significantly associated with age and sex in all the three districts. (Table -4)

Contradictory to this a previous study¹⁴ done in Industrial population in Salem district among spinning mill workers, the positivity was higher (15%) and age and gender was statistically associated with the prevalence of HBsAg. On the other hand positivity rate of HBsAg was higher in certain occupational sectors viz. sewage (6.6%) and solid waste workers (11.3%)^{15,16} in which age and gender association was insignificant in that population which is similar to the present study.

In a similar study conducted in an automobile industry in South West Nigeria positivity was higher (10- 14%) than our study, and the highest prevalence was observed by them in the age group of 41-50.¹⁷ In another study on tourism workers in Egypt, prevalence rate of HBsAg was slightly higher (5.9%).¹⁸ In a study in industrial population of Pakistan high prevalence of HBsAg (14%) was seen in tannery workers. 12% of prevalence was observed in other group of paper mill and textile industry workers and in their study the age group was not statistically associated with the prevalence rate¹⁹.

In a study done in India in the coastal community of Tuticorin,²⁰ the prevalence rate of HBsAg was higher than our study (7.5%). Seropositivity was mainly associated with sexually active stage of study groups in previous studies. In our study it was evenly distributed in Kanchipuram and Erode and older age group in Tiruvannamalai.

Compared with a study among general population in Northern India the prevalence rate was almost similar (2.25%) and predominance was observed in males. Unlike our study, gender and age was significantly associated with the occurrence of HBV and HCV in that study²¹. Therefore, most of the previous studies from India and abroad indicated higher prevalence of HBsAg in professional workers but in our study in weavers community there was not much difference in HBsAg positivity when compared with general population.

Community based studies on the prevalence of Hepatitis C are few. In India the HCV positivity is lowest in Rural West Bengal (0.71%), whereas in the general population is it around 0.9%. Generally higher prevalence was found in chronic liver infections (14%).²²

In Tamilnadu the prevalence rate in voluntary blood donors ranges from (0.75% - 1.4%)^[23] .In our study there was no HCV positivity in Kanchipuram and Erode Districts. However in Tiruvannamalai district one female (0.94%) was positive for Anti HCV in the age group of 51-60. In a previous general population based study from West Bengal the prevalence rate of HCV was slightly lower (0.71%) than our study and the age group (> 60 years)²⁴ is similar to the present study.

In a study conducted in the industrial population in Pakistan the prevalence of HCV was 7% and 9% in tannery and textile workers respectively. In Tourism workers of Egypt the prevalence rate of HCV was 7.4% and the age was independent of the infection.

5. Conclusion

In conclusion the present study revealed that the positive percentage of HBV and HCV in the weaver population is less when compared with other industrial populations.

The positive rate of HBsAg and HCV in weaver group is more or less similar to the general population in India. Age and Gender of the weaver community had no impact in the HBV and HCV positivity.

Table 1: HBS Ag Positivity in Kanchipuram District Weaver Community

Age Group	MALE			FEMALE		
	No of Samples Tested	Positive	%	No of Samples Tested	Positive	%
11 – 20	Nil	-		Nil	-	
21 – 30	4	-		3	-	
31 – 40	15	1	6.6	13	-	
41 – 50	21	-		14	1	7.1
51 – 60	3	-		15	-	
61 – 70	7	1	14.2	2	-	
Total	50	2	4	47	1	2.12

(n- 97)

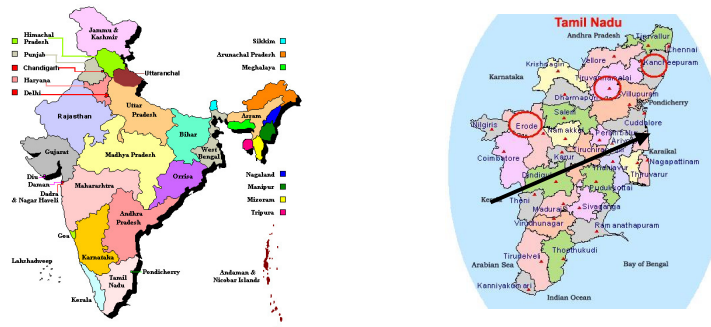


Figure.1 Map showing Kanchipuram, Tiruvannamalai & Erode Districts (encircled) of Tamil Nadu State, India.

Table 2: HBs Ag Positivity in Erode District Weaver Community

Age Group	MALE			FEMALE		
	No of Samples Tested	Positive	%	No of Samples Tested	Positive	%
11 - 20	Nil	-	-	Nil	-	-
21 - 30	Nil	-	-	6	-	-
31 - 40	1	-	-	20	-	-
41 - 50	17	1	5.88	18	-	-
51 - 60	17	-	-	7	-	-
61 - 70	8	1	12.50	2	-	-
71-80	1	-	-	-	-	-
81-90	1	-	-	-	-	-
Total	45	2	4.4	53	-	-

(n- 98)

Table 3: HBs Ag & HCV Positivity in Tiruvannamalai District Weaver Community

Age Group	No. of Samples Tested	HBs Ag MALE		HCV MALE		No. of Samples Tested	HBs Ag FEMALE		HCV FEMALE	
		Positive	%	Positive	%		Positive	%	Positive	%
11 - 20	Nil	-	-	-	-	Nil	-	-	-	-
21 - 30	15	-	-	-	-	16	-	-	-	-
31 - 40	2	-	-	-	-	12	-	-	-	-
41 - 50	3	-	-	-	-	12	-	-	-	-
51 - 60	15	-	-	-	-	12	1	8.33	1	8.33
61 - 70	7	-	-	-	-	6	-	-	-	-
71 - 80	3	-	-	-	-	2	1	50.00	-	-
81 - 90	1	-	-	-	-	Nil	-	-	-	-
TOTAL	46	-	-	-	-	60	2	3.33	1	1.66

(n=106)

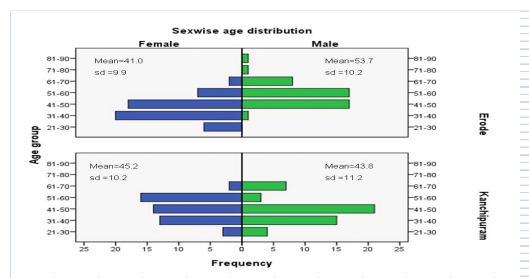


Figure 2 Age and Sex distribution of the study population weaver community

Table 4: Statistical analysis of Age and Gender in HBV, HCV positive cases

Disease	Location	p Value		Significance
		Age Group	Gender	
HBV	Kanchipuram	0.599	0.594	NS
	Erode	0.624	0.404	NS
	Tiruvannamalai	0.392	0.211	NS
HCV	Tiruvannamalai	0.815	0.379	NS

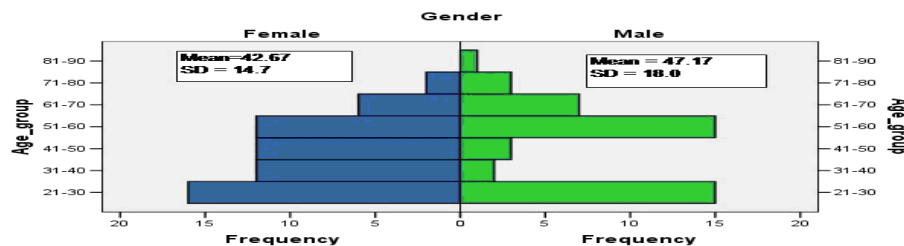


Figure -3 Sexwise age distribution Tiruvannamalai

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