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Original Research Article

Knowledge, awareness and practices related to Hepatitis-B infection and vaccine among general population in Chengalpattu, Tamil Nadu

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ABSTRACT

Background: In India, 1,50,000 deaths are reported annually and 60 million people are affected due to Hepatitis B virus. For any government prevention programs to succeed, community awareness and participation is vital. Therefore, this study sought to assess the knowledge and awareness of hepatitis-B virus and vaccination among general population in rural areas. We also assessed the practices related to the hepatitis B vaccination.
Methods: We conducted a house to house survey in villages of Chengalpattu district. A total of 323 participants agreed to participate in the survey. A 22 item questionnaire was administered to assess the knowledge, awareness and practice. Data were entered in Microsoft Excel spreadsheet and analyzed using Statistical package for social sciences (SPSS) software. Independent t test was used to assess the difference in responses based on the independent variables. Pearson's correlation was used to analyze the association between the level of knowledge, awareness and practice scores.
Results: A total of 323 participants agreed to participate in the survey. Nearly, 87.9% had never heard about hepatitis B. The awareness of a vaccine for hepatitis B among the study subjects was 6.5%. Higher knowledge, awareness and practice were found among those with higher education and working professionals ($p<0.05$). Knowledge, awareness and practice were positively correlated ($p<0.005$).
Conclusions: It can be concluded that the levels of knowledge, awareness and practice in the rural population of Chengalpattu district, Tamil Nadu were marginally low. Extensive awareness and prevention programs related to Hepatitis B virus and its vaccine should be conducted targeting high risk populations.

Keywords: Hepatitis B infection, Vaccination, Illiterates, Graduates, Face to face interviews

INTRODUCTION

As of 2016, the world health organization estimated that 27 million people (10.5%) were aware of their hepatitis B infection. Recent estimate shows that hepatitis accounts for 1.3 million deaths annually, making it the 7th leading cause of death globally.[1] In India, 1,50,000 deaths are reported annually and 60 million people are affected.[2]

Hepatitis B is a serious liver infection caused by Hepatitis-B virus (HBV), which can cause both acute and chronic disease. The discovery of the etiologic agent of hepatitis B and the development of safe and effective vaccines constitute one of the remarkable scientific achievements of the 20th century.[3] In 1981, FDA approved plasma derived hepatitis-B vaccine for human use.[4] Although immunization remains the most effective way to control the spread of HBV infection, it is estimated that every year at least 27 million children worldwide do not receive the basic doses of immunizations.[5]

Identifying the severity of hepatitis infection, about 175 WHO member countries integrated hepatitis B vaccination

in their national immunization program by the year 2009.[6] Universal immunization program (UIP) in India was launched to immunize every child in the country against vaccine preventable diseases and this includes HBV.[7] In India, hepatitis B vaccination programme was initially launched in 2002 with gradual expansion to cover all districts in 10 States of the country in 2007-08.[8]

Despite the efforts of the government towards prevention of HBV, alarming rates and proportions of people who remain unaware and unvaccinated have been reported in the literature. In 2008, Sukriti et al reported that 28% of health care workers in India were unvaccinated and 17% were unaware of their vaccination status.[9] In 2015–16, 45% of the children aged 12–59 months were not vaccinated against hepatitis B in India. Considering that 75% of the population of India lives in rural regions, it is alarming that the conditional probability that a child in urban area will receive HBV vaccine is 0.54 while that in the rural area is 0.49.[10]

For any governmental preventive measures or programs to succeed, community awareness and participation is vital. For that reason, information related to knowledge and awareness of community members is crucial in order to design prevention programs in the community. Therefore, this study sought to assess the knowledge and awareness of hepatitis-B virus and vaccination among general population in rural areas. We also assessed the practices related to the hepatitis B vaccination.

METHODS

Ethical approval

Ethical approval of this study was obtained from the institutional scientific review board.

Sample size and sampling method

Based on a minimum recommended sample size calculation, along with Chengalpattu district's population (2.5 million people), this study required 312 respondents. This sample size is based on the conservative assumption that 50% of participants would have good knowledge and awareness of Hepatitis B virus, with a 5% margin of error and a confidence interval of 95%.

Study area and population

The district of Chengalpattu was selected in the state of Tamil Nadu as the study area. We conducted a house to house survey in villages of Chengalpattu district. A total of 323 participants agreed to participate in the survey.

Questionnaire, data collection and study period

The survey instruments were adapted from previously published articles and were piloted and tested on a sample of 30 participants.[11,12] The responses from these participants were not included in our study. The final version of the structured questionnaire was developed in English and Tamil to guide the interview.

Once the participants agreed to participate, interview was conducted in Tamil or English by trained interviewers. We obtained written informed consent from all participants and the anonymity of the participants was maintained.

There were 22 questions in each questionnaire. The first section of the questionnaire was related to demographic data. The remaining close ended questions were related to HBV knowledge, awareness and previous vaccination. The questions were simple and understandable. The study was conducted between March 01, 2020 to March 17, 2020.

Statistical analysis

Responses were coded and entered into Statistical package for social sciences (SPSS) database. Data were entered in Microsoft Excel spreadsheet and analyzed using SPSS software (version 21, IBM Corporation, Texas, USA). Descriptive statistics were conducted. Independent t test was used to assess the difference in responses based on the independent variables such as age groups, gender, marital status, education level and occupation. Pearsons correlation was used to analyze the association between the level of knowledge, awareness and practice scores.

RESULTS

A total of 323 subjects participated in our survey. Majority of our study subjects (61.6%) belonged to the age group of <40 years while 38.4% belong to the age group of ≥41. About 33.4% were male and 66.6% study subjects were female. Majority of the study subjects were married (81.7%). Most of them had completed graduation or higher studies (43.0%) and were unskilled labours (34%) (Table 1).

Only 7.5% were aware of HBV vaccine being given to a newborn, 6.5% subjects were aware that HBV vaccine should be received in three doses; 6% were aware that Hepatitis B is curable and that there are effective treatments. More than 95% of the study subjects had not been tested for HBV and were not previously vaccinated. However, 78.6% were willing to receive HBV vaccination (Table 2).

Nearly, 87.9% had never heard about hepatitis B, only 1.9% knew someone who was currently infected and 2.5% knew about the consequent liver damage. Only 8.7% of the participants were aware of mother to child transmission. The awareness of a vaccine for hepatitis B among the study subjects was 6.5%. Less than 7% of the study subjects were aware correctly of the transmission of hepatitis B through exchange of needle and sexual transmission, and 10.5% were aware of transmission by blood (Table 2).

Table 1: Distribution of study subjects.

Variable	Categories	Number	Percentage
Age	<40	199	61.6
	≥41	124	38.4
Gender	Male	108	33.4
	Female	215	66.6
Marital Status	Single	59	18.3
	Married	264	81.7
Education	Illiterate	110	34.1
	School	74	22.9
	Graduate or higher	139	43.0
Occupation	Unemployed	105	32.5
	Unkilled labour	110	34.1
	Skilled labour	53	16.4
	White collar Job	34	10.5
	Professional	21	6.5

The mean knowledge score and awareness score was higher among the <40 years study subjects when compared to the >41 years age group. The difference was statistically significant ($p<0.03$, $p<0.05$ respectively). There was no significant difference in the mean practice score between the two age groups. (Table 3) There were no differences in the mean knowledge, awareness and practice scores based on gender or marital status. (Table 4 and 5 respectively).

The mean knowledge, awareness and practice scores were higher for study subjects who had completed their graduation or higher when compared to illiterates or subjects who had only completed school. There was a significant difference in the mean awareness and practice scores based on education. However, we found no statistical significance for the difference in the mean knowledge score. (Table 6)

The mean knowledge, awareness and practice scores were higher for the professional study subjects, lowest mean scores were found among the unemployed and unskilled laborers. There was a significant difference in the mean knowledge, awareness and. practice scores based on occupation ($p<0.001$, $p<0.01$ respectively). (Table 7)

We found positive correlations between knowledge, awareness and practice. As mean knowledge increased, the mean awareness and practice increased. Similar trends were found between awareness and practice. All correlations were found to be significant ($p<0.005$). (Table 8)

Table 2: Aggregate responses to the questions.

Questions		Responses	Number	Percentage
Have you ever heard about Hepatitis B?		Yes	38	11.8
		No	284	87.9
Do you know anyone who is currently infected?		Yes	6	1.9
		No	317	98.1
Do you know HBV can cause liver damage		Yes	8	2.5
		No	315	97.5
Do you know HBV causes yellowing of eyes and skin?		Yes	23	7.1
		No	300	92.9
Do you know alcohol further damages the liver for people with Hepatitis B?		Yes	36	11.1
		No	287	88.9
Do you know HBV can lead to death?		Yes	34	10.5
		No	289	89.5
Do you think HBV spreads through air when a person coughs or sneeze		Yes	31	9.6
		No	292	90.4
Can HBV get transmitted from mother to child?		Yes	28	8.7
		No	295	91.3
Awareness				
Are you aware of a vaccine for Hepatitis B prevention?		Yes	21	6.5
		No	302	93.5
Are you aware how HBV is caused?		Yes	11	3.4
		No	312	96.6
Are you aware that HBV is transmitted through…	Blood	Yes	34	10.5
		No	289	89.5
	Tears	Yes	14	4.3
		No	309	95.7
	Saliva	Yes	28	8.7

Continued.

Questions		Responses	Number	Percentage
		No	295	91.3
	Exchange of needle	Yes	22	6.8
		No	300	92.9
	Sexual transmission	Yes	22	6.8
		No	301	93.2
	Breast milk	Yes	34	10.5
		No	289	89.5
Are you aware that HBV vaccine should be given to newborn?		Yes	25	7.5
		No	298	92.3
Do you know HBV vaccine should be received in three doses?		Yes	21	6.5
		No	302	93.5
Do you know Hepatitis B is curable?		Yes	21	6.5
		No	302	93.5
Do you know there are effective treatments for Hepatitis B?		Yes	20	6.2
		No	303	93.8
Practice related questions				
Have you been tested for HBV?		Yes	6	1.9
		No	317	98.1
Have you been previously vaccinated against HBV?		Yes	10	3.1
		No	313	96.9
Are you willing to receive HBV vaccination?		Yes	254	78.6
		No	69	2.4

Table 3: Comparison of mean awareness, knowledge and practice regarding Hepatitis B among the population based on age groups.

Variable	Mean ± SD Scores		Mean difference	t value	P value
	<40 years	>41 years			
Knowledge	4.39±0.98	4.17±0.74	0.214	2.085	0.03
Awareness	0.60±1.43	0.33±0.81	0.272	1.929	0.05
Practice	0.86±0.45	0.79±0.42	0.074	1.450	0.14

Independent t test; p value <0.05 – statistically significant

Table 4: Comparison of mean awareness, knowledge and practice regarding Hepatitis B among the population based on gender.

Variable	Mean ± SD Scores		Mean difference	t value	P value
	Male	Female			
Knowledge	4.37±0.85	4.27±0.92	0.105	0.987	0.32
Awareness	0.49±1.14	0.50±1.28	-0.011	-0.079	0.93
Practice	0.83±0.42	0.83±0.46	-0.003	-0.073	0.94

Independent t test; p value <0.05 – statistically significant

Table 5: Comparison of mean awareness, knowledge and practice regarding Hepatitis B among the population based on marital status.

Variable	Mean ± SD Scores		Mean difference	t value	P value
	Unmarried	Married			
Knowledge	4.24±1.09	4.32±0.86	-0.080	-0.605	0.54
Awareness	0.64±1.70	0.46±1.11	0.179	0.988	0.32
Practice	0.89±0.45	0.82±0.44	0.068	1.060	0.29

Independent t test; p value <0.05 – statistically significant

Table 6: Comparison of mean awareness, knowledge and practice regarding Hepatitis B among the population based on education.

Variable	Mean ± SD Scores			F value	p-value
	Illiterate	School	Graduate or higher		
Knowledge	4.18±0.81	4.31±0.87	4.41±0.97	1.970	0.14
Awareness	0.40±0.95	0.20±0.61	0.72±1.60	4.861	0.008
Practice	0.79±0.40	0.75±0.43	0.91±0.47	3.892	0.02

One way Anova; p value <0.05 – statistically significant

Table 7: Comparison of mean awareness, knowledge and practice regarding Hepatitis B among the population based on occupation.

Variable	Occupational Classification					F value	P value
	Unemployed	Unskilled labour	Skilled labour	White collar job	Professional		
Knowledge	3.95±0.35	4.42±0.94	4.41±1.02	4.62±1.09	5.50±3.53	7.814	0.001
Awareness	0.09±0.38	0.70±1.42	0.60±1.08	0.64±1.59	3.50±4.94	6.47	0.001
Practice	0.81±0.38	0.77±0.50	0.92±0.26	0.86±0.48	2.00±1.41	3.89	0.01

One way Anova; p value <0.05 – statistically significant

DISCUSSION

National Viral Hepatitis Control Program was launched by the Ministry of health and family welfare. 28th July 2018 - World Hepatitis Day.[13] A key component of the program is the promotive and preventive component which includes awareness generation. This confirms that prevention and control program can only succeed if community members have good knowledge and awareness of the infection. Additionally, Shanmugam et al found that the prevalence of HBV was 1.63% and prevalence was higher in rural areas.[14] Therefore, we selected random villages in the chengalpattu district of Tamil Nadu to explore the knowledge, awareness and practices related to HBV among the general population.

An alarming 87% of our study subjects had not heard about hepatitis B and only about 1.9% of them knew someone who was currently infected. Our findings were low when compared to Singh et al wherein they found that 50% of the respondents in their survey had not heard of hepatitis B.[12] This difference could be attributed to the fact that our study included a rural population, while the latter study was conducted in a city. Ray stated that awareness about HBV infection is dismally low in India, and this problem is compounded by the absence of symptoms (until late stage of disease) in a large majority of cases.[15]

The awareness of the transmission routes of HBV among the study population was also alarmingly low. Only about 10%, 6.8% and 6.8% of the population knew that HBV transmission takes place through blood, exchange of infected needle and sexual transmission respectively. Few studies reported similar findings with regards to the knowledge of routes of transmission via blood, infected needles and sexual transmission.[12,16] Other studies have reported that higher proportion of their populations knew about the routes of transmission of HBV.[17-19] About 8.7% of our respondents were aware that transmission of HBV can take place from mother to child during pregnancy. These findings were similar to that of Singh et al.[12]

Only 6.5% of the respondents were aware of a vaccine for HBV prevention and 3.1% had been vaccinated. These findings were much lower when compared to the findings of previous studies wherein higher proportion of the population were aware of a vaccine and were previously vaccinated.[17,18,20,21] The fact that the previous studies surveyed both urban and rural populations could be the reason for them to have better levels of awareness. However, the low awareness rates are not unexpected among the general population as Sukriti et al found that 44.6% health care workers (HCWs) in their survey could not recall their status of vaccination and about 27.7% of the HCWs were never vaccinated.[9]

Majority of the current study subjects (>90%) were not aware that HBV vaccine should be given to a newborn and that the vaccine should be received in three doses. Previous studies conducted among the general population reported higher percentage of respondents being aware of the vaccination being given to a newborn.[18] Likewise, previous studies reported that about 35-50% children were reported as vaccinated by their parents.(18,22) More than 98% study subjects had never been tested for HBV in our study. Brouard et al found that 83% of their surveyed population had never been tested.[17]

We compared the mean knowledge, awareness and practice scores in the study population based on various socio-demographic variables such as age groups, gender, marital status, level of education and occupation. Those

study subjects below 40 years of age had a higher knowledge and awareness score than those above 40 years of age ($p<0.05$), this was similar to the findings reported by Rajamoorthy et al.[11] Contrasting results were found by a few studies in which the subjects of the higher age groups (>45 years) had a higher mean knowledge.[17,23] The younger study subjects in our study had higher formal education when compared to the older age groups, this could be the reason for their higher mean knowledge and awareness scores.

We found no difference in the levels of knowledge, awareness or practice based on either gender or marital status. However, Rajamoorthy et al found that married subjects and females had higher levels of awareness and knowledge.[11] A study among French study subjects Malaysian university students found that females had a higher level of knowledge of HBV when compared to males.[17,21] Few studies also reported a higher knowledge among married study subjects.[11,21] One study reported contradictory results of male study subjects having higher knowledge were reported.[11]

Graduates or those with higher education had a higher mean awareness and practice scores when compared to those who were illiterates and had completed school ($p<0.008$ and $p<0.02$ respectively). Professionals and those doing white collar jobs had the highest mean knowledge, awareness and practice score among all the occupation categories ($p<0.01$). Most studies found that those with higher education had higher levels of knowledge, awareness and practice.[11,17,21,24]

Interestingly, Padmanathan et al found that those with no formal education had the highest knowledge and awareness levels and subjects who had completed their postgraduation had the lowest level of knowledge and awareness.[23] Similar to the findings of other studies, our data indicated a significant positive correlation between knowledge, awareness and practice scores.[11,21] Additionally, Rajamoorthy et al found that participants who had good knowledge were 2.5 times more likely to have a good awareness.[11] Numerous factors such as racial, cultural, language, literacy and socio-economic differences play a role in determining how one accesses health information.[25]

Limitations

This study had some strengths and limitations. Firstly, a strength of this study is that we attempted a random selection from the population, and therefore our results can be generalized to the population of Chengalpattu district and further to Tamil Nadu. Although, the study was limited by being cross-sectional study, efforts were made to design the study such that the respondents may serve as much as the representatives of the study population as possible. Our results can be generalized with caution to the population of India. This is because India is a vast country with differences in the sociodemographic characteristics and cultures of the population. Nonetheless, the population may differ substantively from other countries of the world.

Secondly, this survey is the face to face interviews we conducted, this helped us in accurate screening, capture the verbal and nonverbal cues of the participants and capture the behaviors of the study subjects. However, there is the possibility of the participants giving socially desirable responses. Furthermore, we did not test the patients for the Hepatitis B surface antigen and antibody (HBsAg) and so the history of vaccination was self-reported; therefore, responses might be subject to recall and response biases.

CONCLUSION

Based on the findings of the present study and within the limitations, it can be concluded that the levels of knowledge, awareness and practice in the rural population of Chengalpattu district, Tamil Nadu were marginally low. The study level, age, and occupation of the respondents were significantly associated with their levels of knowledge, attitude and practices towards hepatitis B. We would like to highlight the small proportion of the population who had been vaccinated. Therefore, well planned and extensive awareness and prevention programs related to Hepatitis B virus and its vaccine should be conducted. Special emphasis must be placed on the rural population of the country as they form the majority of the population in India. Mass media campaigns should be initiated to educate the community about this easily preventable infection.

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