

Original Research Article

Trends of hepatitis B among hospital admissions at tertiary care hospital, Solapur

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ABSTRACT

Background: Hepatitis B is a national and global public health problem. Various studies have supported the change in prevalence and trends of Hepatitis B. The aim of the study was 1) to study the trends of Hepatitis B according to age, sex and area of residence, 2) to study seasonality of Hepatitis B cases, 3) to find geographical predilection of Hepatitis B cases in Solapur city.

Methods: The records of patients with Hepatitis B from January 2012 to December 2016 admitted to tertiary care hospital, was retrieved and studied. Statistical analysis used: Percentages, z test of proportions, ACF and PACF.

Results: Out of 406 Hepatitis B cases, 51.97% belonged to 15 to 45 years of age. There was an increasing trend of Hepatitis B from age of 15 years up to 45 years. The male female ratio was 2.63:1. Fifty-seven percent cases were from urban areas. The proportion of cases from urban area decreased from 9.01% in 2012 to 6.01% in the year 2016. Contrarily, it increased from 5.78% in 2012 to 10.98% in 2016 in rural area. Hepatitis B cases appear to come in sharp rises and falls in these five years with no specific trend. PACF results showed no seasonality. Ward number 17 reported maximum cases.

Conclusions: The primary prevention for Hepatitis B should be targeted at 15 to 45 years of age group. There is no seasonal variation seen in Hepatitis B infection. Areas observed with hot pockets must be screened and kept under surveillance.

Keywords: Hepatitis B, Trend, Seasonality, Rural, Geographical predilection

INTRODUCTION

Hepatitis B is a national and global public health problem. In 2013, viral hepatitis was a leading cause of death worldwide.¹ More than 90% of this burden is due to the sequelae of infections with the hepatitis B virus and hepatitis C virus.¹ Prevention can reduce the rate of new infections. In the absence of additional efforts, 19 million hepatitis-related deaths are anticipated from 2015 to 2030.¹

India has “intermediate to high endemicity” for hepatitis B surface antigen (HBsAg) with an estimated 40 million

chronic HBV infected people, constituting approximately 11 per cent of the estimated global burden.² Population prevalence of HBV infection in India is around 3-4 percent.³ Chronic HBV infection accounts for 40-50 per cent of hepatocellular carcinoma and 10-20 per cent cases of cirrhosis in India.³

Demographic changes and expanded vaccination can create new epidemiological patterns of the virus which will have impact on region-specific endemicity levels. Two-thirds of outbreaks were reported from rural areas by IDSP during 2011-2013 and 7% was due to hepatitis B or hepatitis C.⁴ There is wide variation in HBsAg prevalence in different geographical regions in India.³

Various studies have supported the change in prevalence and trends of hepatitis B in past years.¹⁻⁷ So the present study was undertaken with the following aims and objectives of (i) To study the trends of hepatitis B according to age, sex and area of residence (ii) To study seasonality of hepatitis B cases (iii) To find geographical predilection of hepatitis B cases in Solapur city.

METHODS

This study is a record based retrospective study. The approval of the Ethical Committee of Dr. V.M. Govt. Medical College was obtained before the commencement of the study.

The list of patients suffering from hepatitis B was retrieved from 1st January 2012 to 31st December 2016, from the Communicable Disease reporting register at Record section under Community Medicine Department of Dr. V.M. Govt. Medical College and hospital, Solapur, Maharashtra. Using the medical registration number, their case sheets was traced and was studied for the required variables like name, age, sex, and complete address and laboratory investigations. Only 406 cases with serological evidence of hepatitis B were included in the studies and those patients with repeat admission were excluded to avoid duplication.

The Solapur city map and the list of wards with areas included under it, was obtained from the Health Department of Municipal Corporation. Though there were 233 patients residing in urban area, spot map was prepared for 228 cases as their addresses could be correctly classified into respective wards.

The data collected was tabulated and analyzed using Microsoft excel 2010 and SPSS16 using appropriate statistical test.

RESULTS

A total of 406 hepatitis B cases were reported during the study. Out of the total (112) female cases, 65 (58.04%)

belonged to the reproductive age group. There were 15(3.96%) cases belonging to the age group of 0-14 years (Table 1).

The number of cases increased from 15 years of age up to 45 years and again decreased thereafter. There were 211(51.97%) hepatitis B cases which belonged to the age group 15 to 45 years. Most of the cases belonged to the age group of 40 to 45 years [49 (12.07%)] followed by 47 (11.57%) cases in 35 to 40 years of age group (Figure 1).

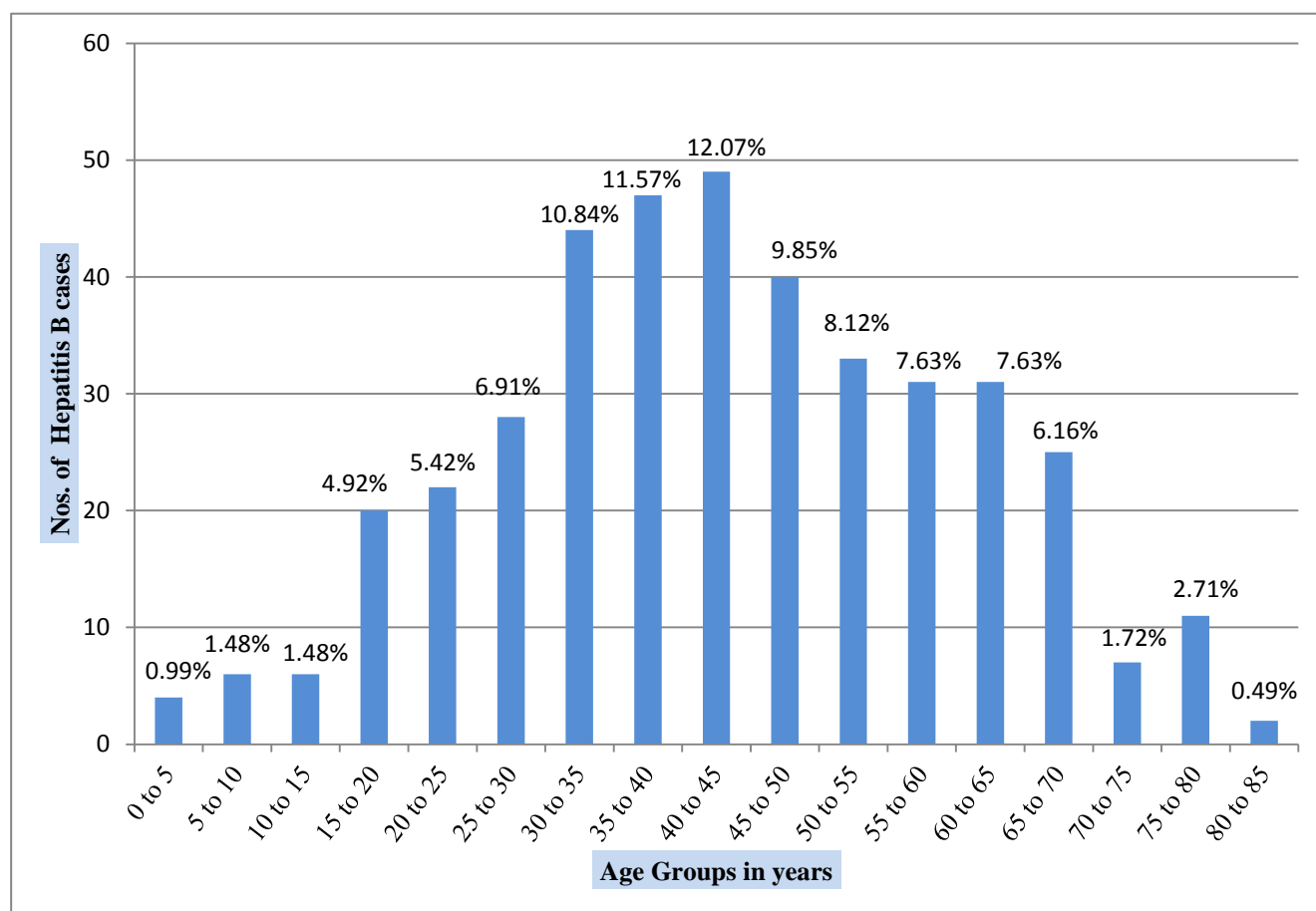


Figure 1: Graph showing distribution of Hepatitis B cases according to age group [N=406].

There were 294 (72.41%) males and 112 (27.59%) females and this difference was proved statistically significant, $p < 0.01$. The male: female ratio was 2.63:1. There were 233 (57.39%) patients from urban area and 173 (42.61%) to rural area. This difference was statistically significant, $p < 0.01$. The urban rural ratio was 1.35:1. The number of cases from urban area was less in the year 2016 (6.01%) as compared to 2012 (9.01%). Contrarily, more cases were reported from rural areas in 2016 (10.98%) than 2012 (5.78%) (Table 2).

There were maximum 135 (33.25%) cases of Hepatitis B reported in the year of 2013. In that period there are two-fold more cases in males as compared to females. The wide gap seen in urban [21 (9.01%)] and rural [10 (5.78%)] distribution of cases in year 2012 has decreased

such that in the year 2016 there are more [19 (10.98%)] cases from rural area than urban area [14 (6.01%)] cases (Table 2).

Table 1: Age and sex wise distribution of hepatitis cases.

Age in years	Males (%)	Females (%)	Total (%)
0-14	07 (2.38)	08 (7.14)	15 (3.69)
15-45	146 (49.65)	65 (58.04)	211 (51.97)
46-59	73 (24.83)	16 (14.29)	89 (21.92)
>60	68 (23.13)	23 (20.54)	91 (22.41)
Total	294 (100)	112 (100)	406 (100)

Table 2: Year wise distribution of hepatitis B cases according to sex and area of residence.

Year	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	Total (%)		
Sex	Male	21 (7.14)	98 (33.33)	71 (24.15)	80 (27.21)	24 (8.16)	294 (100)	$P < 0.01^*$
	Female	10 (8.93)	37 (33.04)	22 (19.64)	34 (30.36)	9 (8.04)	112 (100)	
Area of residence	Urban	21 (9.01)	82 (35.19)	57 (24.46)	59 (25.32)	14 (6.01)	233 (100)	$P < 0.01^*$
	Rural	10 (5.78)	53 (30.64)	36 (20.81)	55 (31.79)	19 (10.98)	173 (100)	
Total	31 (7.64)	135 (33.25)	93 (22.91)	114 (28.08)	33 (8.13)	406 (100)		

*z test of proportions.

There is increase in number of Hepatitis B cases from September 2012 to March 2014 and later there is sharp rises and falls in number of cases at irregular interval. Hence no specific trend was observed (Figure 2).

In Figure 3 plotting of auto correlation function (ACF) and partial autocorrelation function (PACF) showed no significant lag at 4, 8, 12 and 16. So this rules out any seasonal component in the data.

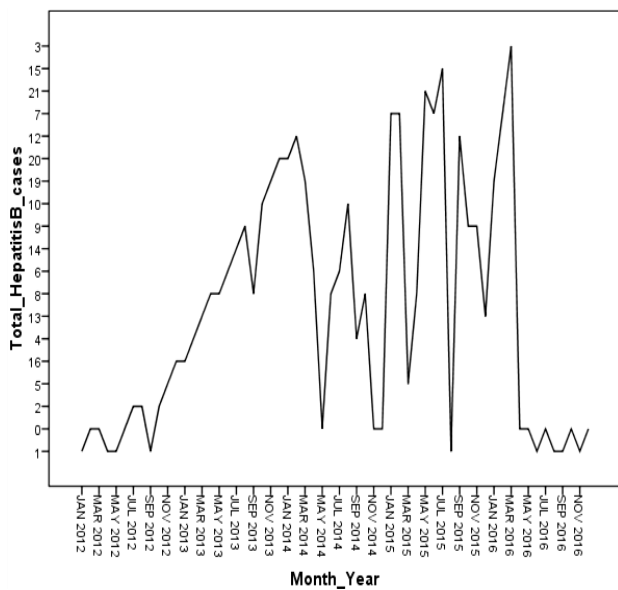


Figure 2: Month-wise distribution of hepatitis B cases.

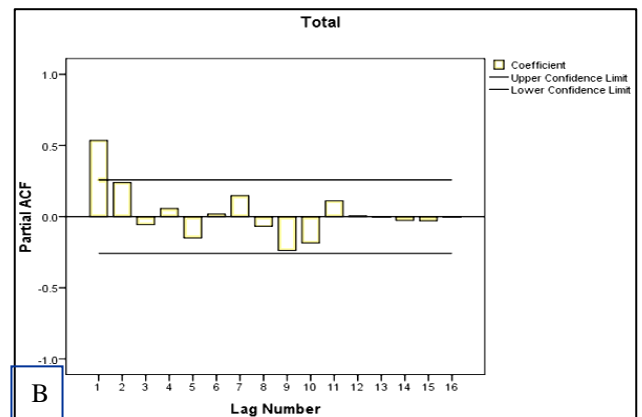
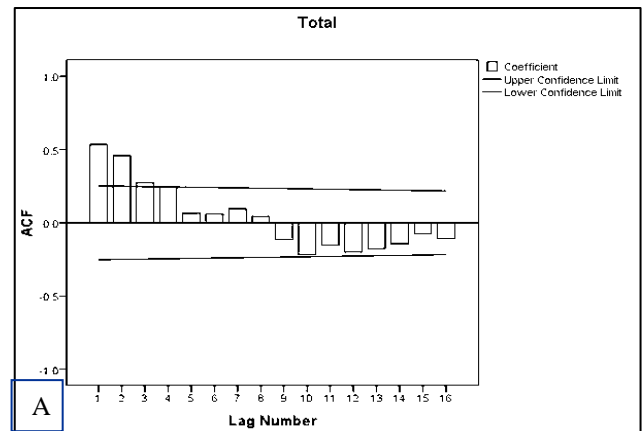


Figure 3: Partial autocorrelation plot for hepatitis B cases (A =ACF, B =Partial ACF).

A majority of cases i.e. 27 were reported from ward nos.17 from Solapur city, followed by ward nos.50 reported 18 cases, ward nos.6 reported 14 cases, ward no.45 and 46 each reported 13 cases and ward no.48 and 2 reported 10 cases each. There were even some wards without any cases. There was clustering of cases in the central part of Solapur city (Figure 4).

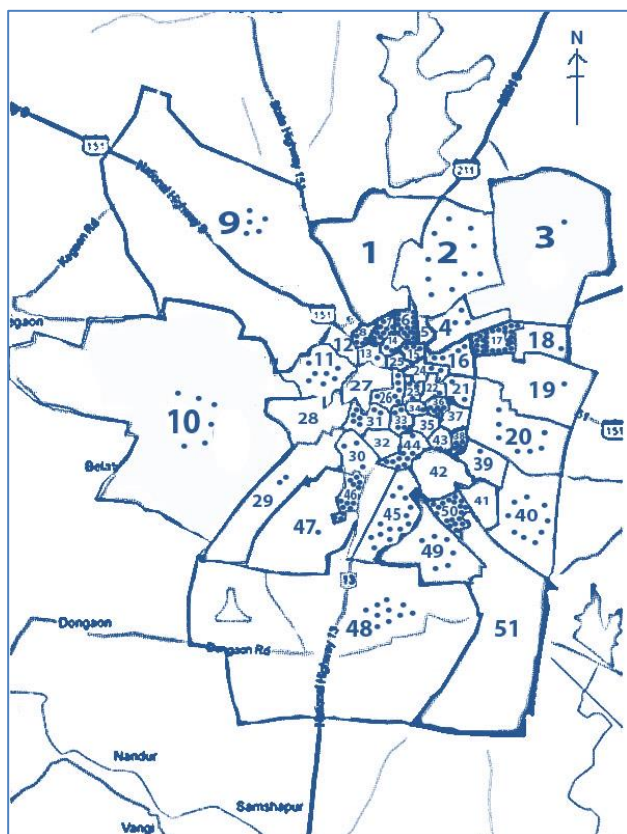


Figure 4: Spot map of hepatitis B cases residing in Solapur city.

DISCUSSION

In our study almost half of the total cases (51.97%) and 58.04% of the total females were from 15 to 45 years. This warrants an early intervention at the commencement of reproductive life. There were 3.96% cases belonging to age group of 0 to 14 years, which indicates that apart from sexual transmission other routes of Hepatitis B transmission are still prevalent in society. Many cases belonged to age group 40-45 years (12.07%) followed by 35 to 40 years (11.57%) in this study. Similar age group i.e. 35-45 year age was also reported by Behal et al and 37.2±16.2 years age group was reported by Ziad et al in their study.⁹ But Sood reported that the highest prevalence was noted in age group of 51-60 years.¹⁰ Singh et al reported that majority of the seropositive donors were younger than 35 years (137) and 52 donors above 35 years.¹¹

There is increasing trend of Hepatitis B cases from 15 years of age up to 45 years of age group and decreasing

thereafter. Similarly Behal et al reported that the age specific prevalence rose from 1.78% (108/6058) in donors aged 19-25 years to a maximum of 3.03% (96/3161) in donors aged 35-45 years and decreased in older age groups.⁸

There was statistically significant difference in number of admission of males and females in our study. Similarly Behal et al, Ziad et al, Singh et al reported that HBV was reported more in males than females.⁸⁻¹⁰ Whereas Kurien et al reported that the difference was statistically non-significant ($p=0.3$), and also Jadeja P et al reported that though the sero-prevalence rate was more among male donors than in female blood donors (1.35% versus 0.48% respectively) but, this difference was statistically insignificant ($p = 0.183$).^{12,13}

The sex difference in hepatitis B prevalence may be due to a difference in viral exposure with men being more exposed as a result of inherently more active lifestyle or behavior.¹⁰

This study reported that the difference in admissions from urban and rural area was statistically significant [57.39% and 42.61% respectively $p < 0.01$]. Mehmet D et al also reported that there was a significant difference (crude OR: 0.74; 95% CI: 0.55 - 0.98) in HBsAg positivity between urban (6.2%) and rural areas (8.2%).¹⁴ But Kurien et al reported that there was no statistical difference in residence (rural 1378, urban 420; $P = 0.8$).¹²

In our study it was found that, there was increase in rural cases as compared to urban cases in last one year of study. Probably due to migration there is rapid transmission of disease from urban area to rural area or can also be due to increase in health seeking behavior and awareness among rural population.

In this study, for hepatitis B cases, neither an increasing trend nor decreasing trend was observed. But Singh et al and Memish et al reported decreasing trend in their study.^{9,11}

There was no evidence of seasonality in the hepatitis B admission at hospital. Similarly Memish et al and Donald et al also reported that there was no seasonal variation found in HBV incidence.^{9,15}

There is maximum clustering of cases seen in Central Solapur which needs further investigations. The wide variation seen in the presentation of hepatitis B cases is probably due to different health seeking behavior, local cultural behaviors and beliefs and varying socioeconomic conditions.

The limitation of this study is that it is a hospital based study, the results of this study cannot be generalized to the population of Solapur, but can be of assistance for the mapping of viral hepatitis prevalence and may be helpful in planning public health interventional strategies.

CONCLUSION

Preponderance of hepatitis B was seen in the active and reproductive age groups of 15 to 45 years more in males and in urban areas. Various campaigns can be undertaken to create awareness regarding epidemiology of hepatitis B and available vaccine. There was no seasonal variation seen in reporting of hepatitis B cases. This study gives the scientific base for undertaking further analytical studies to establish the facts. Areas reported with high hepatitis B cases should be screened for more cases and to locate pockets of infection and for any social pathology.

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REFERENCES

1. WHO publication. Combating Hepatitis B and C to reach elimination by 2030. Available at: <http://apps.who.int/iris/bitstream/10665/206453/1/>. Accessed on 12 Sept 2015.
2. Batham A, Narula D, Toteja T, Sreenivas V, Puliye JM. Systematic review and meta-analysis of prevalence of Hepatitis B in India. *Indian Pediatr.* 2007;44:663-74.
3. Kumar M, Sarin SK. Viral hepatitis eradication in India by 2080- gaps, challenges and targets. *Indian J Med Res.* 2014;140:1-4.
4. Kumar T, Shrivastava A, Kumar A, Laserson SD, Narain JP, Venkatesh S. Viral Hepatitis Surveillance-India, 2011-2013. *Centers for Disease Control and Prevention MMWR.* 2015;64:758-62.
5. Ahmed W, Qureshi H, Arif A, Alam S. Changing trend of Viral Hepatitis-A twenty one year report from Pakistan Medical Research Council Research Center, Jinnah Postgraduate Medical Centre, Karachi. *J Pak Med Assoc.* 2010;60:86-9.
6. Byrd KK, Redd JT, Holman RC, Haberling DL, Cheek JE. Changing trends in viral hepatitis-associated hospitalizations in the American Indian/Alaska Native population, 1995-2007. *Public Health Rep.* 2011;126:816-25.
7. Purcell R. Hepatitis viruses: Changing patterns of human disease *Proc. Natl. Acad. Sci. USA* 91 (1994) Available at: <http://www.pnas.org/content/91/7/2401.full.pdf>. Accessed on 12 September 2015.
8. Behal R, Jain R, Behal K, Bhagoliwal A, Aggarwal N, Dhole T. Seroprevalence and risk factors for hepatitis-b virus infection among general population in Northern India. *Arq Gastroenterol.* 2008;45(2):137-40.
9. Memish Z, Bandar A, Knawy, Aiman El-Saed. Incidence trends of viral hepatitis A, B, and C seropositivity over eight years of surveillance in Saudi Arabia. *Int J Infectious Diseases.* 2010;14:115-20.
10. Sood S. Serological evaluation of hepatitis b virus in out patient department patients of a private hospital in North-west India. *National J Community Med.* 2013;4:485-8.
11. Singh K, Bhat S, Shastri S. Trend in seroprevalence of Hepatitis B virus infection among blood donors of coastal Karnataka, India. *J Infect Dev Ctries* 2009;3:376-79.
12. Kurien T, Thyagarajan S, Jeyaseelan L, Peedicayil A, Rajendran P, Sivaram S, et al. Community prevalence of hepatitis B infection & modes of transmission in Tamil Nadu. *India Indian J Med Res.* 2005;12:670-5.
13. Jadeja P, Kaur A, Shekha H. Trend In Seroprevalence Of Hepatitis B Virus Infection Among Blood Donors At A Tertiary Care Centre Of Rajasthan, India. *National J Med Res.* 2014;4:205-7.
14. Mehmet D, Meliksah E, Serif Y, Tuncer SGO, Simsek Zeynep JPN. Prevalence of Hepatitis B infection in the Southeastern Region of Turkey: Comparison of risk factors for HBV infection in rural and urban Areas. *J Infect Dis.* 2005;58:15-9.
15. Donald P, Francis T, Prendergast J, Peterson E, Ginsberg M, Lookabaugh C, et al. Occurrence of hepatitis A, B, and non-A/non-B in the United States: CDC sentinel county hepatitis study. *Am J Med.* 1984;76:69-74.

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