



Mini Review

Viral Hepatitis in India

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Abstract

Viral hepatitis is a cause for major health care burden in India and is recently equated as a threat comparable to the "big three" communicable diseases – HIV/AIDS, Malaria, and Tuberculosis. Hepatitis A virus and Hepatitis E virus are predominantly enterically transmitted pathogens and are responsible to cause both sporadic infections and epidemics of acute viral hepatitis. Hepatitis B virus and Hepatitis C virus are predominantly spread via parenteral route and are notorious to cause chronic hepatitis which can lead to grave complications including cirrhosis of liver and hepatocellular carcinoma.

The Government of India launched a new National Viral Hepatitis Control Program (NVHCP) on World Hepatitis Day -28 July 2018. It will be an integrated approach for prevention and control of viral hepatitis, with a view to provide free of charge screening, diagnosis, treatment & counselling services to all, and specially to people belonging to high-risk groups to achieve SDG goal 3.3 which aims ending viral hepatitis by 2030 as envisaged in National Health Policy 2017.

This review article aims to cover the basic virologic aspects of these viruses and highlight the present scenario of viral hepatitis in India, justifying the launch of National Viral Hepatitis Control Program.

Introduction

Global situation

Viral hepatitis is now recognized as a major public health challenge that requires an urgent response. Viral Hepatitis caused 1.34 million deaths in 2015, a number comparable to deaths caused by tuberculosis and higher than those caused by HIV [1]. It is estimated that worldwide, Hepatitis A Virus (HAV) infection caused approximately 11,000 deaths in 2015 (accounting for 0.8% of the mortality from viral hepatitis) [2]. It is estimated that 325 million people worldwide are living with chronic HBV or HCV infection and 1.75 million people were estimated to be newly infected with HCV in 2015, increasing the total number of people living with Hepatitis C to 71 million [1]. Every year, there are an estimated 20 million Hepatitis E Virus (HEV) infections worldwide leading to an estimated 3.3 million symptomatic cases of acute hepatitis E. It is estimated

that Hepatitis E caused 44,000 deaths in 2015 (accounting for 3.3% of mortality due to viral hepatitis [1].

Recent improvements in vaccines and treatments against viral hepatitis, an updated epidemiological understanding of the burden of viral hepatitis is needed to strategize interventions. A study using the data from the Global Burden of Disease (GBD) estimated morbidity and mortality for acute viral hepatitis, and for cirrhosis and liver cancer caused by viral hepatitis, by age, sex, and country from 1990 to 2013 [2]. Between 1990 and 2013, global viral hepatitis deaths increased from 0.89 million to 1.45 million; YLLs from 31.0 million to 41.6 million, YLDs from 0.65 million to 0.87 million; and DALYs from 31.7 million to 42.5 million. In 2013, viral hepatitis was the seventh leading cause of death worldwide, compared with tenth in 1990 [3].

Burden of Hepatitis in India: The routine reporting of Hepatitis to central Bureau of Health Intelligence (CBHI) is



highly underreported as it includes cases reaching facilities in Public sector. Hepatitis cases in India usually approach traditional healers as there is a belief that Allopathy has no treatment for the condition. People reach modern system health facilities only if there are complications, like liver failure or Primary Cancer of liver that too in urban India. Due to paucity of data, the exact burden of disease for the country is not established. However, available literature indicates a wide range and suggests that HAV is responsible for 10–30% of acute hepatitis and 5–15% of acute liver failure cases in India. It is further reported that HEV accounts for 10–40% of acute hepatitis and 15–45% of acute liver failure. HAV and HEV are important causes of acute viral hepatitis and Acute Liver Failure (ALF). Hepatitis B surface Antigen (HBsAg) positivity in the general population ranges from 1.1% to 12.2%, with an average prevalence of 3–4%. Anti-Hepatitis C virus (HCV) antibody prevalence in the general population is estimated to be between 0.09–15% [4].

Based on some regional level studies, it is estimated that in India, approximately 40 million people are chronically infected with Hepatitis B and 6–12 million people with Hepatitis C [5]. Chronic HBV infection accounts for 40% of Hepato-cellular Carcinoma (HCC) and 20–30% cases of cirrhosis in India [6]. Chronic HCV infection accounts for 12–32% of HCC and 12–20% of cirrhosis [2]. Population based syndromic and health facility-based Presumptive and Laboratory confirmed case surveillance of viral hepatitis is mandated under the Integrated Disease Surveillance Program (IDSP). A systematic review of available information from published studies and from large unpublished reliable datasets, to assess the prevalence of chronic HCV infection in the Indian population has recently been done by age, sex, risk factors and place in the country. This meta-analysis data estimated that India (current population approx. 1.3 billion) has 5.2–13 million anti-HCV positive persons. As the data on HCV viremia amongst the anti-HCV positive persons were not available, data from elsewhere was used to estimate that India has about 3 million to 9 million persons with active HCV infections.

Routine reporting of viral Hepatitis (ICD 10, Code no Code B15–B19) cases and deaths from 28 states and 8 Union territories to the Central Health Intelligence Bureau was in the range of 144000 – 160000 {(145970 in 2016, (159675–2017) and (143,974 in 2018)} each year over last three years. The number of reported deaths were 451, 507 and 584 in 2016, 2017 and 2018 respectively indicating a case fatality of less than 0.5% (0.3, 0.32 and 0.4% in 2016, 2017 and 2018, respectively). Seven states of Bihar (28,401), Madhya Pradesh (14,855), UP (13,250) Maharashtra (11,762), Uttarakhand (10,930), Delhi (10,320) and Punjab (9831) in 2016 contributed 68% of total cases. In 2017 out of a total of 159675 cases Bihar (24,630), UP (20226), MP (17657), Punjab (13971), Delhi (13323), Uttarakhand (10900), Haryana (9085) and AP (7117) contributed 73% of cases and in 2018 the provisional data indicated that UP 24868, Punjab-16909, Delhi-12377, Haryana 9470, Maharashtra 9030, Uttarakhand 8774, AP- 8817, MP-7395, Gujarat 7325, Bihar 4985 & Assam 4930 contributed 73% of the total number of 143,974 cases [7].

In Uttar Pradesh, the largest state and consistently reporting more than 20,000 cases annually between 2016–18, a Hospital based study prevalence study in 2013, Of the 267 viral hepatitis cases, 62 (23.22%) patients presented as acute hepatic failure. HAV (26.96%) was identified as the most common cause of acute hepatitis followed by HEV (17.97%), HBV (16.10%) and HCV (11.98%). Co-infections with more than one virus were present in 34 cases. HAV–HEV co-infection being the most common. HEV was the most important cause of acute hepatic failure followed by co-infection with HAV and HEV [8].

HAV is responsible for several outbreaks of sporadic viral hepatitis in India. Piped water contamination from were identified as a source of infection in majority of the outbreaks in India since last 30 years. Since independence Indian urban bodies use metal (galvanized iron) pipes which corrode and start leaking over time. The sewage pipes and water pipes unfortunately were laid side by side until recently, that led to large scale outbreaks in towns. In mid-1990, The Municipal corporation of Surat, Gujarat following an big outbreak in the city reported such outbreaks for last 10 years and expressed helplessness as the replacement of the water pipe line would cost entire budget of the city corporation for 10 years. In a recent study by Rakesh et al. from Kerala, HAV was identified as the etiology for an outbreak of AVH at Mylopore village of Kollam district. The authors noted a high attack rate in subjects aged 15–24 years (4.6%) when compared to subjects aged 5–14 years (3.1%). Pipe water contamination from a borewell was identified as a source of infection in this village.

In an elegant study by Acharya et al., the seroprevalence of anti-HAV antibodies was assessed in 1424 school children aged between 4 and 18 years and 93.2% of children were found to have anti-HAV antibodies in their sera. The seroprevalence of anti-HAV was also assessed in 256 patients with underlying chronic liver disease and 97.6% of them tested positive indicating the high seroprevalence of Acute Viral Hepatitis (AVH) in India [7]. In another study from Kottayam, HAV was deemed responsible for an outbreak of AVH in the medical college area and the authors emphasized on the need for a definite policy for control of viral hepatitis [8]. In a study from Lucknow, 267 patients with AVH were evaluated and HAV was identified as the most common etiology responsible in 26.96% patients followed HEV in 17.97% [7].

HEV causes severe liver disease in individuals with underlying chronic liver disease, an entity recently termed as acute-on-chronic liver failure (ACLF). Several studies from India have depicted the prevalence of HEV-related ACLF. In a recent study by Shalimar et al. from New Delhi, HEV-related ACLF has been shown to have lower mortality when compared to ACLF due to other aetiologies (12.8% vs. 33–54%).

HBV scenario in india

India falls into the category of intermediate endemicity for HBV and the common genotypes reported from India are A followed by D.27. In a population-based study conducted by Chowdhury et al., 7653 subjects were screened and 2.97% tested positive for HBsAg, of whom majority (90%) were Hepatitis B



e antigen (HbeAg) negative and Hepatitis Be antibody (anti-HBe)-positive. A study by Lodha et al. from New Delhi depicted the prevalence of HBV infection in India to be 1–2% [8].

The predominant mode of transmission of HBV in India is horizontal,³⁷ although a recent study by Dwivedi et al. has shown 56.8% of pregnant women with HBV infection to be in the high replicative phase and having HB e Ag positivity, suggesting vertical transmission to play a significant role in India as well. The prevalence of HBsAg positivity in antenatal women was noted to be 0.9% in this study [9].

HBV vaccination in india

Recognizing the seriousness of HBV infection, Hep B vaccination program was initially launched in 14 metropolitan cities of India in June 2002 and then additional 33 rural districts were included for vaccination in October 2003. The use of Hep B vaccine was further expanded to cover all districts in 10 states of the country in 2007–08 and entire country is being covered since 2009. Although hepatitis B vaccinations has been integrated in the Universal Immunization Program (UIP) in India over a decade, only half of the children are immunized against hepatitis B. Using data of 199,899 children aged 12–59 months indicated that in 2015–16, 45% of the children were not vaccinated against hepatitis B in India [10].

HCV scenario in india

The estimated prevalence of HCV infection in India is about 1–1.9% [9]. In an elegant population-based study done by Chowdhury et al. from West Bengal, the seroprevalence of HCV antibody positivity was noted in 0.87%. The prevalence showed an increasing trend from 0.31% in children aged below 10 years to 1.85% in adults aged 60 years or more with no difference in prevalence between males and females [9]. In another study carried out by Singh et al. on 22,666 trainees of Indian Armed Forces, the seroprevalence of anti-HCV positivity was noted to be 0.44% [9]. The possible explanation to this low prevalence was exclusion of those who may be at risk for HCV infection from recruitment as military trainees [11].

Conclusion

Lancet study results show that viral hepatitis is one of the leading causes of death and disability worldwide, and causes at least as many deaths annually as tuberculosis, AIDS, or malaria. By contrast with most other communicable diseases, hepatitis has risen in importance since the first GBD Study in 1990. As India launches a major new effort to tackle viral hepatitis, these data are of crucial importance to national health policy 2017. Despite improvements in vaccines and treatments against viral hepatitis, the absolute burden and relative rank of viral hepatitis has increased between 1990 and 2013, when compared to most other communicable diseases of viral origin like, polio, Influenza, Japanese encephalitis. The sequel of chronic hepatitis which includes cirrhosis and HCC poses long term burden on the health system. It is also true that the health systems contribution in reducing the burden of hepatitis is less

when compared to laying fresh water and sewage pipelines at a reasonable distance in the cities. Better management of piped water supply in major cities and introduction of auto-disable syringes for immunization and Reuse Prevention (RUP) syringes for curative service injections are critical intervention put in place already to interrupt the chain of such transmission and most developing countries are facing financial constraints for these interventions.

The key objectives of the NVHCP launched in 2018 has following objectives Enhance community awareness on hepatitis and lay stress on preventive measures among general population especially high-risk groups and in hotspots.

1. Provide early diagnosis and management of viral hepatitis at all levels of healthcare
2. Develop diagnostic & treatment protocols for management of viral hepatitis & its complications.
3. Strengthen the existing infrastructure facilities, build capacities of existing human resource, and add human resources, for providing comprehensive services for management of viral hepatitis all districts.
4. Develop linkages with the existing National programs
5. Develop a web-based “Viral Hepatitis Information and Management System” to maintain a registry of persons affected with viral hepatitis and its sequelae.

Way forwards

The enormous health loss attributable to viral hepatitis, is an important opportunity to improve public health. It suggests that the availability of effective vaccines and treatments, can contribute a part but most has to come from investment by Municipalities and Rural development departments in achieving Open air Defecation Free (ODF) status, safe water supply and ensuring minimizing cross contamination of water from sewage from parallelly laid pipelines.

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