

Epidemiology and Burden of Viral Hepatitis: Hospital Based Study

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Abstract

Background: Viral hepatitis is a major public health problem throughout the world. It is the inflammation of the liver due to the infection of any of the five main hepatic viruses A to E and it affects the liver through different modes of transmission. This study mainly aims at the frequency and distribution of viral hepatitis based on age, gender and immunization status during a time period of 1 years and its complications.

Objective: To describe the epidemiology and estimate the health resource use of patients with viral hepatitis at Sir Ronald Ross Institute of Tropical and Communicable diseases

Materials and Methods: This is a hospital-based retrospective study of 1 year at IDSP network hospital in Sir Ronald Ross institute Of Tropical and Communicable Diseases{SRRIT&CD}, Hyderabad, in India. All cases of viral hepatitis admitted at SRRIT&CD, Hyderabad in the period from January 2015 – December 2015 were taken as study group. Clinical and epidemiological features and complications were analysed. The data on frequency and distribution of viral hepatitis based on age and gender. Immunization status, clinical symptomatology and complications were also assessed during the study period.

Result: Out of 378 cases, 57.67% were males and 42.32 % were females. The preponderance of males was apparent in all types of viral hepatitis infection. The incidence varies with age group. The main subtype in the present study was hepatitis A virus (HAV) and followed by hepatitis B virus (HBV). Of total viral hepatitis cases, 352 were due to HAV, 25 (6.61%) cases were HBV virus, 1(0.26%) case of C virus respectively. In the present study, there was no case of hepatitis D virus has reported. No deaths were noted in this study. Seasonal peak was noted in the month of July and August. Majority of the patients were Non immunized(68.25%. Few patients had the complications like diarrhea, coagulopathies, anaemia, urinary tract infection, rash and pneumonia.

Conclusions: This hospital based study of viral hepatitis allows outcomes to be identified. Those at risk of viral hepatitis infection should be informed about the future implication to their health and costs to society. The health service should investigate the cost effectiveness of vaccination.

Keywords: Epidemiology, viral hepatitis, Hepatitis B, Hepatitis A

I. Introduction

In this hospital based study, although cases occurred throughout the year, more of them occurred during July to August, which is the transition period between summer and monsoon months. The incidence was highest among males. Hepatitis A, B and C were identified in this study. Hepatitis A (HA) was the predominant type; being comparatively mild, it is perhaps underrepresented in hospital-based data. Many HA cases were in adults, which may be the beginning of an age shift of HA to the right owing to improvements in living standards of the study population. 25 cases were diagnosed as hepatitis B virus (HBV), indicating the importance of HBV infection in India as well. Finally, the study found the annual incidence of laboratory-supported cases of viral hepatitis, which suggests that it is a major public health problem in India. Hospital based studies have primarily been used to estimate incidence of disease. This study describes the epidemiology and complications in relation to the immunization status.

II. Materials and Methods:

This hospital based study was done among the patients of viral hepatitis admitted at Sir Ronald Ross Institute of Tropical and communicable diseases (SRRIT & CD), Hyderabad during the period of one year (January 2015 – December 2015). Cases which are not confirmed, patients of age group between 0-4 years, patients who died before any therapeutic measure was done and the patients who left the hospital against

medical advice were excluded. Clinical data was documented for each case which included symptoms like jaundice, nausea, abdominal pain, fever, pruritis and generalized weakness. The patients were clinically examined for the presence of relevant signs like icterus, and rash etc, to arrive at the provisional diagnosis. Routine investigations including liver function tests were done for all cases. Blood samples from all cases who had signs of jaundice of the reference period were tested for markers of viral hepatitis. The total number of the patients suffering from different types of viral hepatitis were statically analysed for age and gender distribution, immunization status and complications. These cases were treated effectively with supportive and specific therapy etc., Whenever patient developed systemic complications they were referred to higher centres.

III. Results

In this hospital based study, during a reference period of 1 year, 378 cases of jaundice were detected in our study. The subtypes were shown in the Table 1. The main subtype in the present study was hepatitis A virus (HAV) and followed by hepatitis B virus (HBV). Of total viral hepatitis cases, 93.12% were due to HAV, % hepatitis B virus were 6.6% hepatitis C virus were 0.26%. In the present study, there was no case of Hepatitis D and E virus has reported. Out of 378 cases, 57.67% were males and 42.32% were females as shown in Table 2. The preponderance of males was apparent in all types of viral hepatitis infection. The incidence varies with the age groups and the age of the patients differed with each type of infection as shown in Table 3. It showed strange seasonal variation with peak in the months of July and August and second peak in the month of April as shown Table 4. Majority of the patients had not taken complete immunization as shown in the Table 5. Clinical symptomatology was described in Table 6. Few cases showed complications like diarrhea, coagulopathy, anaemia, Urinary tract infection, rash and pneumonia as shown in Table 7.

Table 1: Subtypes of viral hepatitis (n= 378)

Subtypes	Number of cases	
	Number	Percentage
Hepatitis B	25	6.61%
Hepatitis C	01	0.26%
Hepatitis A	352	93.12%
Total	378	100%

Table 2: Gender wise distribution of Viral Hepatitis(n= 378)

Gender	Number of cases	
	Number	Percentage
Males	218	57.67%
Females	160	42.32%
Total	378	100%

Table 3: Age wise distribution of viral hepatitis patients (n=378)

Month	5-14 years	15-30 years	>30 years
January	10	10	7
February	5	2	5
March	7	10	19
April	18	6	22
May	7	10	9
June	11	12	10
July	20	9	20
August	27	3	20
September	6	10	9
October	21	4	10
November	5	4	5
December	6	2	17

Table 4: Month wise distribution of cases of Viral Hepatitis cases (n=378)

Month	January	February	March	April	May	June	July	August	September	October	November	December
No. of cases	27	12	28	46	26	36	52	51	25	35	14	26
Percentage	7.14	3.17	7.40	12.16	6.87	9.52	13.75	13.49	6.61	9.25	3.70	6.87

Table- 6: Immunization status of the Viral Hepatitis (n= 378)

Immunization status	Number of cases	
	Number	Percentage
Completely immunized	120	31.74%
Not known	258	68.25%
Total	378	100.00%

Table 7: Clinical features of Viral Hepatitis (n=378)

Complications	Number of patients	Percentage
Diarrhea	20	5.29%
Coagulopathies	19	5.02%
Anaemia	19	5.02%
UTI	18	4.76%
Rash	10	2.64%
Pneumonia	5	1.32%

Table 8: Clinical features of Viral Hepatitis cases(n=378)

S. No	Clinical symptoms	Percentage
1	Nausea, icterus abdominal pain, fever	100%
2	Pruritis	2.64%
3	Generalized weakness	100%

IV. Discussion

In this hospital based study during a reference period of 1 year, 378 cases of jaundice were detected. According to this study, the incidence of the disease appears to be constant and epidemics were seen. The case definition used was that proposed by the WHO standard operating procedures^{2,3,4}. The majority had poor and low socioeconomic status. Complete (31.74%) and Not known (68.25%) immunized patients were mainly responsible for the outbreaks of Viral Hepatitis. Few of the cases had complications like coagulopathies, chronic diarrhea, rash, anaemia, urinary tract infection, pneumonia in this study.

This reflects gross negligence on the part of both the patients as well as the healthcare system. Majority of Viral Hepatitis patients had resorted to different indigenous treatment practices due to the desperate need of treatment of cases with poor prognosis. In addition, it is well known that availability and affordability of Viral Hepatitis immunization still needs to improve, and that the facilities and services are poor in various health centers. Simultaneously, extensive public education for both rural and urban community is equally important for reducing Viral Hepatitis outbreaks.

An attempt to study the seasonal variation of Viral Hepatitis revealed a strange seasonal variation with peaks in the months of July and August and the second peak in April. The reason for the observed upsurge of the disease could be probably the transition phase of the seasons which makes the adjustment of the host to the changed weather difficult, thus increasing their susceptibility and also makes the conditions favourable for the survival of the agents of the diseases. Host behaviour is one of the cause for seasonal variation in diseases like Viral Hepatitis as well as other communicable diseases.

In order to reduce the morbidity and mortality caused by viral hepatitis, WHO organized a mass hepatitis vaccination for the all age groups. Before then, viral hepatitis containing vaccine was administered with routine services in health facilities.⁵ There were yearly epidemics reported in various countries. With a maximum vaccination coverage during the viral hepatitis mass campaign, most of the countries were able to reduce the number of viral hepatitis cases.⁶ Despite such a significant progress, Viral hepatitis outbreaks of varying intensity have been reported here and there.⁷ Most of the developed Asian countries have been able to reduce Viral hepatitis deaths to a great extent, but in countries like India, it is still a major problem and report many deaths every year.

The other major factor for increased mortality in viral hepatitis is the lack of data on the incidence of disease as well as deaths, particularly from the India. Surveillance systems needs to be strengthened in the countries like India in order to obtain accurate data before taking appropriate control measures. Epidemiological surveys to estimate the burden of viral hepatitis and its mortality rate were done in various countries.⁵⁻¹¹ This type of hospital based studies can help in developing the new strategies to reduce the number of viral hepatitis cases and to plan for its elimination. Hence we made an attempt, this kind of study in our hospital mainly to estimate the burden of viral hepatitis and its epidemicity. The results were compared to other similar hospital based studies.¹²⁻¹⁵ Large scale surveys as well as hospital based studies are needed to provide the valuable data for prevention and control of viral hepatitis in future. The result is similar to ours where 37.1% tested seropositive for HAV. This study also agrees with a pattern of increasing HAV seropositivity with increasing age.^{1,12} Termorshuizen et al¹² suggested that the cohort effect was associated with an increase in

HAV seropositivity in the elderly population because the possible time exposed is greater in the older population. Increasing hygiene may also affect transmission of HAV in the younger population. Prevaccination testing may also play some part in the high number of HAV positive patients.

The majority of HCV and HBsAg positive patients were younger males. Exposure to intravenous drug use is a possible transmission route for HCV and was significantly associated with HCV infection in this study. The prevalence of disease is similar to published studies. Similar studies found a HBV prevalence of 4.2% and 0.3% which is similar to the prevalence rates of those tested in our study.¹³⁻¹⁵ The prevalence of HCV positive tests among those tested for HCV was higher than the estimated world prevalence of approximately 1.5%—this represents testing of high risk groups, such as patients that are drug dependent which is a major risk factor for HCV infection.¹⁴ The morbidity after diagnosis with HBsAg and HCV shows the clinical burden of disease.

There are limitations to every study design. In this study the majority of viral hepatitis cases were diagnosed by clinical suspicion of underlying disease and this is likely to underestimate the total number of viral hepatitis infections in our population as there may be subclinical or asymptomatic infection. Patients symptomatic of liver disease and those entering the health care field are tested for viral hepatitis only if clinically indicated.

But the prevalence of known viral disease compares well with other published studies suggesting that our method of identifying patients is comparable with other study designs.

We have made an attempt to provide a good surveillance system and to understand whether the current focus of Viral Hepatitis prevention is appropriate as well to ascertain the necessary changes to deal this disease more effectively. We also recommend the following measures for prevention and control of Viral Hepatitis.

1. It is recommended that all people should receive the life-saving vaccine including the booster doses from the health institutions.
2. It is very important to educate the people about immunization protocol in order to prevent high incidence of Viral Hepatitis.
3. Prevention of the Viral Hepatitis is also possible by elimination of the risk factors causing them. So proper education of the patient is mandatory by public health staff and also the improvement of the public health infrastructure, immunizations, screenings, and as control and prevention of Viral Hepatitis.
4. Insight into seasonal disease patterns may be useful. Alerts and timely information about emerging or seasonal trends of the Viral Hepatitis are mandatory.

V. Conclusions

In conclusion, the epidemiology of viral hepatitis from a population base should aid in prioritising preventive measures by identifying the at-risk populations. This will allow for the most appropriate use of available resources. Accordingly, the appropriate precautions can be implemented to decrease the prevalence of this emerging infection. Taking the safety measures including vaccination and proper management of waste materials and improving the sanitation facilities are the only solution to control or eradicate this infection.

References

- [1]. Marcus EL, Tur-Kaspa R. Viral hepatitis in older adults. *J Am Geriatr Soc* 1997;45:775–63.
- [2]. Barros H, Oliveira F, Miranda H. A survey on hepatitis A in Portuguese children and adolescents. *J Viral Hepatitis* 1999;6:249–53.]
- [3]. Sotiropoulos A, Peppas TA, Skliros E, *et al.* Low prevalence of hepatitis C virus infection in Greek diabetic patients. *Diabet Med* 1999;16:250–2.
- [4]. Osmon DR, Melton LJ, Keys TF, *et al.* Viral hepatitis: a population-based study in Rochester, Minn, 1971-1980. *Arch Intern Med* 1987;147:1235–40.
- [5]. Alter M, Kruszon-Moran D, Nainan OV, *et al.* The prevalence of hepatitis C virus infection in the United States, 1988 through 1994. *N Engl J Med* 1999;341:556–62.]
- [6]. Bellentani S, Pozzato G, Saccoccio G, *et al.* Clinical course and risk factors of hepatitis C virus related liver disease in the general population: report from the Dionysos study. *Gut* 1999;44:874–80.
- [7]. Delage G, Infante-Rivard C, Chiavetta J, *et al.* Risk factors for acquisition of hepatitis C virus infection in blood donors: results of a case-control study. *Gastroenterology* 1999;116:893–9.
- [8]. Information and Statistics Division. Scottish health statistics 1999. Edinburgh: ISD Scotland Publications, 1999.
- [9]. Evans JMM, McDevitt DG, MacDonald TM. The Tayside medicines monitoring unit (MEMO): a record-linkage system for pharmacovigilance. *Pharm Med* 1995;9:177–84.
- [10]. Carstairs V. Deprivation and health in Scotland. *Health Bull (Edinb)* 1990;48:162–75.
- [11]. Information and Statistics Division. Scottish health services costs, year ended 31st March, 1997. Edinburgh: ISD Scotland Publications, 1997.

- [12]. Termorshuizen F, Dorigo-Zetsma JW, de Meldker HE, *et al.* The prevalence of antibodies to hepatitis A and its determinants in The Netherlands: a population-based survey. *Epidemiol Infect* 2000;124:459–66.]
- [13]. Shapiro CN, Margolis HS. Hepatitis B epidemiology and prevention. *Epidemiologic Rev* 1990;12:221–7.]
- [14]. Rosen HR. Primer on hepatitis C for hospital epidemiologists. *Infect Control Hosp Epidemiol* 2000;21:229–34.
- [15]. Scottish Needs Assessment Programme (SNAP) report. Dr H Howie (chair). Hepatitis C. Glasgow: Office for Public Health in Scotland, 2000.