

The Effect of Environmental Factors and Socio-Economic Profile in Infective Hepatitis.

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ABSTRACT

Background: Hepatitis can be defined as "Infection of the liver". Hepatitis A is caused by water pollution due to fecal contamination. The aim of study is to know the various epidemiological factors in patients with infective hepatitis admitted in the Kasturba hospital. To identify environmental factors, demographic and socio-economic profile of infective hepatitis. **Methods:** The present study was conducted in an urban hospital, "Kasturba Hospital" at Chinchpokali to discuss the epidemiological aspects of the infective hepatitis cases. 220 cases were studied prospectively, they were interviewed for the history and physical examination. **Results:** 1) Out of 220 case males were 126 (57.2%) and female were 94 (42.8%), 2) The age group 15-34 years had the cases 71 (32.27%) and 25-34 age group had the cases 73 (33.18%). The cases declined further with subsequent age groups 35 and above. The difference in child age and adult age was significant, 3) Majority of patients presented with dark yellow urine 87.72%, loss of appetite 83.63% and icterus 96.36%, 4) The patients having liver enlargement were 128 (58.2%) and was significant, 5) The percentage of the patients taking meals outside was 60% and found to be highly significant, 6) Majority of the patients had municipal tap water supply (94.00%), 7) More numbers of patients at chawls were 47.2% and huts were 30 (13.6%), the difference was significant. **Conclusion:** Health Education should be given to the community regarding the modes of transmission and method of prevention of infective hepatitis through simple and effective media.

Keywords: Environmental factors, socio-economic profile, infective hepatitis

INTRODUCTION

Hepatitis can be defined as "Infection of the liver", - Hepatitis may be caused by variety of etiological agents, which may be classified as follows. 1) Infective Agents: a) Virus - Hepatitis A,B,C,D,E,G, non A, non B virus, EBV, CMV, Herpes virus, b) Protozoa - E histolytica, Plasmodium, c) Spirochaetes - Leptospira, Treponema, d) Fungi - Actinomyces, 2) Toxic agents: a) Drugs- Antituberculous drugs, Methyldopa, Ketoconazole, b) Alcohol, c) Miscellaneous- Some poisonous mushroom, Aflatoxins, 3) Other causes: a) Auto immune hepatitis, b) Metabolic Disorders- Wilson's disease.^[1] Hepatitis A is known as Infective hepatitis, caused by water pollution due to fecal contamination and hepatitis B known as serum hepatitis, caused by virus, parenteral transmission, though the plasma remains infectious the virus has been detected in the stools. It appears more certain that hepatitis associated antigen occurs in serum hepatitis and not in the infectious

hepatitis. Though the Pathophysiology of both diseases is identical, serum hepatitis has longer period than infective hepatitis. The period varies around 100 days in HAB and 30-60 days in hepatitis A.^[2]

This is not a constant feature and many cases overlap, further making it difficult to separate the two diseases. A larger amount of the information has now been accumulated from various studies. Though it is very difficult for separation of types of hepatitis, still all world cases of jaundice are grouped together with note indicating the source of contamination and mode of the transmission.^[3]

The vehicle of infection is usually water, and pollution, can occur due to fecal contamination, whereas sewage is discharged into the sea, but not at great depth, sea food like clams and oysters when eaten can also transmit the disease. The study on human volunteers had dispel some confusions that previously existed and it appears that viral hepatitis can be caused by more than one viruses.^[4]

The risk of transmission HAV is greatest from 2 weeks before to 1 week after the onset of jaundice. Infective Material is mainly by oral route, feces, blood, serum and other fluids are infective during viremia.^[2]

In typical cases, there is a pre-icteric and icteric stage but an icteric stage cases without jaundice are very

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common especially in children. The disease spectrum is characterized by the occurrence of the numerous subclinical or asymptomatic cases. The disease is benign with complete recovery in several weeks. The case fatality rate of icteric cases is less than 0.1 percent. Usually from acute liver failure and mainly affects older adults. Although the disease has in general, a low mortality (0.1%) patients may be incapacitated for many weeks.^[5-9]

In India the disease tends to be associated with periods of heavy rainfall. Poor sanitation and over-crowding favors the spread of infections giving rise to waterborne and food borne epidemics, when standards of hygiene, and sanitation are improved, morbidity from infection with enteric viruses may increase. The vehicle of infection is usually water and pollution can occur due to fecal contamination, whereas sewage is discharged into the sea, sea foods when eaten can transmit the disease.^[6]

The WHO study shows that countries of the south-east Asia region have a high prevalence of viral hepatitis it is a disease known through the ages both the sporadic and epidemic forms of jaundice have been described in ancient medical literature. But it was only in 1976 that the WHO south-east Asia region took up the challenge to deal with it. That year, the south-east Asia regional advisory committee on medical research as its second meeting decided that liver diseases were a priority area of research, since then it has vigorously supported research on liver disease in the countries of the region as a result the wealth of information has been amazed on the epidemiology transmission and the nature of the infections.^[7-15]

The aim of study is to know the various epidemiological factors in patients with infective hepatitis admitted in the Kasturba hospital. To identify environmental factors, demographic and socio-economic profile of infective hepatitis.

MATERIALS AND METHODS

The present study was conducted in an urban hospital, "Kasturba Hospital" at Chinchpokali to discuss the epidemiological aspects of the infective hepatitis cases. The study was carried out between the periods of 'October 2003 to December 2003.

220 cases were studied prospectively, they were interviewed for the history and physical examination and the investigations for serum bilirubin (direct and total), routine blood count, and Australia antigen were carried out at admission and before discharging the patients. The collection of the data from the sample was carried out for features like socio economic factors, environmental factors, demographic profile, habits and customs etc. A suitable questionnaire cum clinical examination type proforma was designed.

- 1) History taking: A careful history was elicited from the patients. A careful note was taken about the

patient's diet, about the personal habits of drinking alcohol, smoking, tobacco chewing, history of contact, previous history of similar attack, visit to the hotels, type of water supply and sanitary facilities. Special emphasis was given on demographic profile, socio economic factors, risk factors, habits and customs and environmental factors.

- 2) Physical Examination: A careful general and systemic examination was done. Built and nutrition, Pyrexia, Icterus, Fetor hepaticus, Palmar erythema, Flapping tremors, Ascites, Odema in feet, Spider naevi. Thorough physical examination was carried out on the patients on admission, on discharge and in between and when felt necessary. Systemic examination especially per abdominal for liver and spleen was done.

RESULTS

All the data in this study was collected, compiled and analyzed.

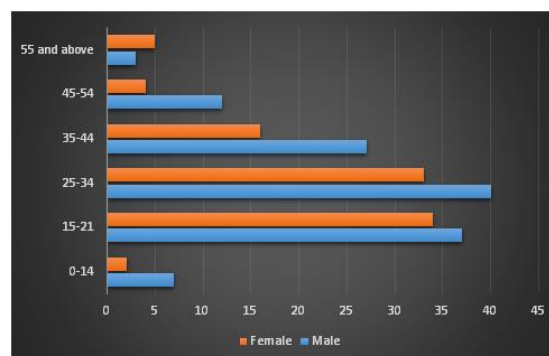


Figure 1: Distribution of patients of infective hepatitis according to age and sex

Table 1: Incidence of symptoms and signs occurring in the cases of infective hepatitis.

| Symptoms | No of Cases | Percentage |
|----------------------|-------------|------------|
| Dark Yellow urine | 193 | 87.72% |
| Loss of Appetite | 184 | 83.63% |
| Icterus | 212 | 96.36% |
| Nausea | 156 | 70.90% |
| Vomiting | 72 | 32.72% |
| Abdominal Pain | 58 | 26.36% |
| Fever | 137 | 62.27% |
| Headache | 46 | 20.90% |
| URI | 12 | 5.45% |
| Cough | 4 | 1.81% |
| Lassitude & Fatigue | 144 | 65.45% |
| Constipation | 57 | 25.90% |
| Muscles & Joint Pain | 10 | 4.54% |
| Urticaria | 1 | 0.45% |
| Fetor hepaticus | 16 | 7.27% |

According to the age, the age group of (25-34 yrs) had the highest number of cases 73 (33.18%) in which male cases were 40 (31.7%) and female cases were 33 (35.10%). There was no appreciable difference in age group of (15-24 yrs) and (25-34 yrs). The cases were 71 (32.27%) and 73 (33.18%) respectively. There were four pregnant women, 3 in

first trimester and 1 in third trimester. The number of cases of infective hepatitis declined in subsequent age groups of increasing age as, (7.27%), (3.63%) in age groups of 45 to 54 and 55 and above respectively. The difference between the age of adults and child was found to be significant. The total mean in adult was 30.83 and SD 10.64, the total mean in children was 45.6, SD 2.64 [Figure 1].

Out 220 patients, most of patient presented with loss of Appetite, dark yellow urine, vomiting, lassitude & fatigue. Out of these, 96.36% patients had icterus 87.72% showed dark yellow urine 83.63% showed loss of appetite. 70.90% showed nausea. Most of the patients presented other symptoms like abdominal pain, cough, muscle & joint pains fever, URI, headache etc [Table 1].

Table 2: Distribution of the cases of infective hepatitis according to the hepatic enlargement.

| Liver | Male | Female | Total |
|--------------|------------|-------------|-------------|
| Palpable | 84 (66.6%) | 44 (46.80%) | 128 (58.2%) |
| Non Palpable | 42 (33.4%) | 50 (53.2%) | 92 (4.8%) |
| Total | 126 | 94 | 220 |
| $X^2 = 6.56$ | df = 1 | p < 0.01 | |

Out of 220 cases, liver enlargement (mild) was present in 128 cases (58.2%). Out of these male cases were 84 (66.6%) and female cases were 44 (46.80%). The difference was significant ($P < 0.01$) [Table 2].



Figure 2: Distribution of patients according to the place of taking meals prior to the infection.

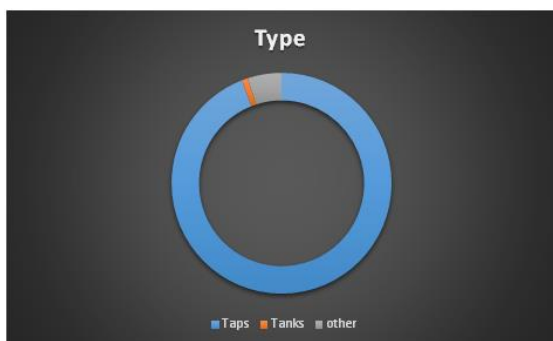


Figure 3: Type of drinking water in the cases of infective hepatitis.

It was observed that in patients of infective Hepatitis history was given of consumption of food from outside by 132 patients where males cases were 85

and female cases were 47, and patients taken their meals from home were, males 41 and females 47, total was 88. The percentage was high in patients taken food outside home (viz. hotels, restaurant, and roadside). The percentage was (67.40%) in males and 50% in females with total 60% from outside of both males and females. The percentage of meals taken at home were, male cases (32.6%) and female (50%) with total of 40%. The difference occurring between the number of cases of infective hepatitis taking meals outside and at home was highly significant [Figure 2].

Out of 220 patients 207 (94.00%) patients had water supply from taps, 2 (0.9%) patients had supply from tanks, and 11 (5.1%) patients had water supply from other sources likes (wells, Bores, etc.). The percentage was 94.0% from tap water which was from municipal supply [Figure 3].

Table 3: Distribution of the patients according to the type of housing.

| Residence | Male | Female | Total |
|---------------------------------------|------------|------------|-------------|
| Building | 49 (38.9%) | 37 (39.4%) | 86 (39.2%) |
| Chawls | 66 (52.4%) | 38 (40.4%) | 104 (47.2%) |
| Hut tents towards the railway station | 11 (8.7%) | 19 (20.2%) | 30 (13.6%) |
| Total | 126 | 94 | 220 |
| $X^2 = 7.09$ | df = 1 | p < 0.002 | |

It was observed that the more cases 104 (47.2%) were residing at chawls where the male cases were 66 (52.4%) and female cases were 38 (40.40%). In huts the total cases were 30 (13.6%) where the male cases were 11 (8.7%) and female cases were 19 (20.2%). The difference between the cases according to the type of residence was found to be statistically significant [Table 3].

Table 4: Distribution of the cases according to the amount intake in hepatitis A.

| Total calories per day | Male | Female | Total |
|------------------------|-------------|------------|------------|
| >1600 | 32 (26.98%) | 26 (27.6%) | 60 (27.2%) |
| 1601 - 1800 | 35 (27.70%) | 49 (52.3%) | 84 (38.2%) |
| 1801 - 2000 | 38 (30.15%) | 12 (12.7%) | 50 (22.8%) |
| >2001 | 19 (15.17%) | 7 (7.4%) | 26 (11.8%) |
| Total | 126 | 94 | 220 |
| $X^2 = 16.97$ | df = 3 | p < 0.001 | |

Table 5: Distribution of the cases of infective hepatitis according to the occupation.

| Occupation of the patient | Male | Female | Total |
|---------------------------|------------|-------------|-------------|
| Unskilled | 76 (60.1%) | 37 (39.4%) | 113 (51.4%) |
| Skilled | 35 (27.7%) | 15 (16.1%) | 50 (22.6%) |
| Self employee | 8 (6.7%) | 22 (23.40%) | 30 (13.6%) |
| Unemployed | 7 (5.5%) | 20 (21.11%) | 27 (12.4%) |
| total | 126 | 94 | 220 |
| $X^2 = 10.87$ | df = 3 | p < 0.02 | |

Out of 220 cases the calories taken by the patients less than 1600 were 60 (27.2%) out of which male

and female cases were 32 (26.98%) and 26 (27.60%) respectively. The difference between the cases according to caloric intake was found to be statistically significant [Table 4].

It was observed that out of 220 case, male cases unskilled were 76 (60.1%) and female cases 37 (39.4%), total 113 (51.4%).

In the skilled work the males cases were 35 (27.7%) and female cases 15 (16.1%), total were 50 (22.6%). In self employee the male cases were 8 (6.7%) and females' cases were 22 (23.40%) and total cases were 30 (13.6%). The total cases of unemployed were 27 (12.4%) out of which males were 7 (5.5%) and females were 20 (21.1%). The difference between occupations of the cases was found to be statistically significant.

DISCUSSION

The aim of present study was to find out epidemiological factors in the Infective hepatitis, and to find out the proportion of Infective hepatitis with other infectious diseases in the Kasturba Hospital. 220 patients of Infective hepatitis were studied, examined and analysed.

The patients presented with symptoms like Anorexia, dark yellow urine fever, vomiting, lassitude and fatigue, icterus, clubbing etc. Most of the patients had dark yellow urine (87.72%), and 83.63% showed anorexia, 70.90% showed nausea, 96.36% cases had icterus. The patients presented with symptoms like abdominal pain, cough muscle and joint pain and urticaria etc. In most of the patients pre-icteric stage was characterized by lassitude and fatigue, fever, nausea, and anorexia. Though viral hepatitis in its typical acute form is readily recognizable, there are many variations in the clinical picture and many in apparent infections occurs. Diagnosis of the sporadic cases may be difficult especially in the older patients, however the abrupt onset that frequently occurs in the later with severe generalised constitutional symptoms, with or without evidence of involvement of the respiratory or gastrointestinal tract, may make the distinction from a member of other acute infections difficult. Recognition of the possibility of hepatitis is often delayed for three to four days until the major are oriented around the gastrointestinal tract. In another study conducted by Manns et al¹⁶ showed that 90% of the patients had icterus and 92% had nausea!

Liver findings and Liver function Test in the present study showed that patient had abdominal pain and tenderness more on the right side. Liver enlargement was termed minimal when the liver edge was palpable 2 to 3 cm, moderate when 4 to 8 cm and marked when over 8 cms, below the costal margins 36. Liver enlargement was present on admission (58.2%) in the males (65%) and females were (46.80%). The difference between the palpable liver and non palpable liver in male and

females was found to be statistically significant. ($p < 0.01$)

Out of 220 patients 90.09% patients had water supply from taps, from the tanks 0.9% and others 5.1%. Patients believed that there was no need to boil, filter the water as the water supply was from municipal taps which is thou necessary to filter to remove any obvious chlorinated. They used cloth as a filter, and filtered occasionally. Very few patients knew the need of the boiling the water, but they did not do this as they could not afford fuel. As a result they were naturally not protected from Water borne infection.

The results of WHO supported research and studies have confirmed that acute viral hepatitis is widely prevalent throughout the region. It has been estimated that the average incidence of acute viral hepatitis according to hospital admission is about 100 per 100,000 population. Considering that in many countries hepatitis is not a notifiable disease and also taking into account apparent hepatitis cases not reporting to hospitals and non-apparent cases in the community, it is estimated that the number of acute viral hepatitis cases would be about 900 per 100,000 population. This means that about 10.5 million cases occur sporadically every year in the countries of the region. The figure would be greatly increased by the frequent epidemic out breaks in different parts of the region. These results indicate the magnitude of the problem of viral hepatitis in the region.^[17-20]

Hepatitis A infection in adults is extremely rare since childhood exposure to HAV confers life-long immunity. The improved standards of hygiene, sanitation and drinking water have drastically reduced the level of HAV circulation in Indonesia and Thailand the number of immune children and young adults is decreasing and hence the incidence of HAV infection in adults is increasing. Association of Physician of India had mention that the diagnosis of hepatitis A virus infection is based on detection of antibodies against HAV in the serum. During the course of infection IgM antibodies are the first to appear and can be detected rarely in the course of clinical illness i.e. during the phase of transaminase elevation. These antibodies persists for several months and then gradually disappear, IgG anti HAV appears during convalescent persists at a detectable level throughout the life and confers protection against reinfection. Thus the presence of IgM anti HAV in serum suggests a recent HAV.^[21,22]

Bad housing leads to increase sickness rates particularly for infections, contagious and other communicable disease". Over-crowding showed infection 3:6 without overcrowding 1:0, low socio-economic status had associated with the increased risk of infection.^[8] An increase with magnitude of infection was observed with decrease of literacy rate?

Limitations

The present study had the following limitations:

- 1) The study was carried out in month of October and November, seasonal variation of infective hepatitis could not be made out, as many cases are admitted in the rainy season.
- 2) It was a hospital study therefore incidence and prevalence could not be carried out and component of hospital bias was present.
- 3) Only serious cases were admitted in the hospital, so mild and moderate hepatitis were not included in the study.

CONCLUSION

- 1) Out of 220 case males were 126 (57.2%) and female were 94 (42.8%).
- 2) The age group 15-34 years had the cases 71 (32.27%) and 25-34 age group had the cases 73 (33.18%). The cases declined further with subsequent age groups 35 and above. The difference in child age and adult age was significant.
- 3) Majority of patients presented with dark yellow urine 87.72%, loss of appetite 83.63% and icterus 96.36%.
- 4) The patients having liver enlargement were 128 (58.2%) and was significant.
- 5) The percentage of the patients taking meals outside was 60% and found to be highly significant.
- 6) Majority of the patients had municipal tap water supply (94.00%).
- 7) More numbers of patients at chawls were 47.2% and huts were 30 (13.6%), the difference was significant.

REFERENCES

1. Ray KW, Brown RS, Terrault NA, Hashem ES. Burden of liver disease in the United States: summary of a Workshop. *Hepatology*. 2002;36:227–242.
2. Lee S, Woojin C, Kyung-Rae H. Socioeconomic costs of liver disease in Korea. *Korean J Hepatol*. 2011;17:274–291.
3. Iacobucci G. Liver disease rises in England while falling elsewhere in Europe, report says. *BMJ*. 2012;345:e7931.
4. Adam R, Karam V, Delvart V, et al. Evolution of indications and results of liver transplantation in Europe. A report from the European liver transplant registry (ELTR) *J Hepatol*. 2012;57:675–688.
5. Marinho RT, Gira J, Moura MC. Rising costs and hospital admissions for hepatocellular carcinoma in Portugal (1993–2005) *World J. Gastroentero*. 2007;13:1522–1527.
6. Cortez-Pinto H, Gouveia M, dos Santos Pinheiro L, et al. The burden of disease and the cost of illness attributable to alcohol drinking—results of a national study. *Alcohol Clin Exp Res*. 2010;34:1442–1449.
7. Cortez-Pinto H, Marques-Vidal P, Monteiro E. Liver disease-related admissions in Portugal: clinical and demographic pattern. *Eur J Hepatol*. 2004;16:873–877.
8. John RM, Sung HY, Max W. Economic cost of tobacco use in India, 2004. *Tob Control*. 2009;18:138–143.
9. Fenoglio P, Parel V, Kopp P. The social cost of alcohol, tobacco and illicit drugs in France, 1997. *Eur Addict Res*. 2003;9:18–28.
10. Colagiuri S, Lee CM, Colagiuri R, et al. The cost of overweight and obesity in Australia. *Med J Aust*. 2010;192:260–264.

11. Zhang W, Bansback N, Anis AH. Measuring and valuing productivity loss due to poor health: a critical review. *Soc Sci Med*. 2011;72:185–192.
12. Rehm J, Dawson D, Frick U, et al. Burden of disease associated with alcohol use disorders in the United States. *Alcohol Clin Exp Res*. 2012;38:1068–1077.
13. Anderson P, Chisholm D, Fuhr DC. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet*. 2009;373(9682):2234–2246.
14. Chisholm D, Rehm J, Van Ommeren M, Monteiro M. Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol*. 2004;65(6):782–793.
15. Bruix J, Barrera JM, Calvet X, et al. Prevalence of antibodies to hepatitis C virus in Spanish patients with hepatocellular carcinoma and hepatic cirrhosis. *Lancet*. 1989;2:1004–1006.
16. Manns MP, McHutchison JG, Gordon SC, et al. Peginterferon alfa-2b plus ribavirin compared with interferon alfa-2b plus ribavirin for initial treatment of chronic hepatitis C: a randomised trial. *Lancet*. 2001;358:958–965.
17. Liaw YF, Sung JJ, Chow WC, et al. Lamivudine for patients with chronic hepatitis B and advanced liver disease. *N Engl J Med*. 2004;351:1521–1531.
18. Sarrazin C, Berg T, Ross RS, et al. Prophylaxis, diagnosis and therapy of hepatitis C virus (HCV) infection: the German guidelines on the management of HCV infection. *Z Gastroenterol*. 2010;48:289–351.
19. van der Meer AJ, Veldt BJ, Feld JJ, et al. Association between sustained virological response and all-cause mortality among patients with chronic hepatitis C and advanced hepatic fibrosis. *JAMA*. 2012;308:2584–2593.
20. Shariff MI, Cox IJ, Gomaa AI, et al. Hepatocellular carcinoma: current trends in worldwide epidemiology, risk factors, diagnosis and therapeutics. *Expert Rev Gastroenterol Hepatol*. 2012;3:353–367.
21. Chhatwal J, Ferrante SA, Brass C, et al. Cost-effectiveness of boceprevir in patients previously treated for chronic hepatitis C genotype 1 infection in the United States. *Value Health*. 2013;16:973–986.
22. Cure S, Bianic F, Gavart S, et al. Cost-effectiveness of telaprevir in combination with pegylated interferon alpha and ribavirin in previously untreated chronic hepatitis C genotype 1 patients. *J Med Econ*. 2014;17:65–76.

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