

Prevalence of hepatitis B and C infections in Akola district- 4 year retrospective study

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Abstract

Introduction: Viral hepatitis is caused by hepatotropic viruses (Hepatitis A-G). Amongst these, hepatitis B virus and hepatitis C virus are responsible for more mortalities and morbidities due to liver cirrhosis and hepatocellular carcinomas. Various tests are available for detection of hepatitis viruses. Rapid immunochromatographic test are easy, give results in 15-20 minutes, widely available and hence are used more in recent days. **Aims and objectives:** This study was undertaken to study the prevalence of hepatitis (B and C) in Akola district. **Material and methods:** This study is a retrospective study conducted from 1st January 2016 to 31st December 2019 in the department of microbiology at Government Medical College, Akola. Samples coming from both Out patient department (OPD) and In patient department (IPD) patients were included. Hepatitis B and C were tested by Rapid immunochromatographic tests. **Results:** Out of 70520 samples received for HBsAg testing (Hepatitis B surface Antigen), 1263 samples (1.79%) were positive. 8 samples showed co-infection with HCV (Hepatitis C Virus) antibody testing. Males were more affected than females (1.25:1). 21-30 years age group was most commonly affected (27.94% cases). Out of 22975 samples received for HCV antibody testing, 65 samples were positive (0.28%). Maximum number of HCV positive cases was in 31-40 years age group (27.69%). **Conclusion:** Prevalence of Hepatitis B and C was found lower as compared to other studies but increase in immunization, proper blood transfusion practices, use of sterile needles and syringes can still lower it.

Keywords: co-infection, HBsAg, HCV, Rapid immunochromatographic tests, retrospective study.

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Introduction

Hepatitis B virus belongs to hepadnavirus, hepatitis C virus belongs to flavivirus, Hepatitis D virus requires HBV for its replication. Hepatitis B virus (HBV) is transmitted vertically (i.e from mother to child), parenterally and sexually. Hepatitis C virus (HCV) is transmitted parenterally. It can also be transmitted sexually and vertically. Hepatitis A and hepatitis E is transmitted by feco-oral routes, through food and water[1]. According to WHO guidelines 2017, an estimated 257 million people are living with Hepatitis B virus infection (HBsAg positive)[2]. Globally, between 20 and 30% of patients with chronic HBV infection will develop cirrhosis or hepatocellular carcinoma[2]. In the year 2015, there were 88700 deaths due to hepatitis B virus infection[3]. Chronic HBV infection is defined as persistence of hepatitis B surface antigen (HBsAg) for at least six months. Several rapid diagnostic tests were developed for screening purposes, such as, solid-phase assays, flow- through, agglutination, and lateral-flow. The majority of rapid tests are based on immunochromatographic principle[4]. Globally it is estimated that 71 million people have chronic hepatitis C infection[5]. It is estimated that 27% of cirrhosis and between 25% and 30% of hepatocellular carcinomas (HCC) are caused by this virus[6].

Approximately, 399000 people each year die from cirrhosis and hepatocellular carcinoma[5].

Material and methods

All blood samples from OPD and IPD coming to microbiology department from 1st January 2016 to 31st December 2019 were included in the study. Serum was separated by centrifugation and was used for study.

HBsAg test- HBsAg was tested using Aspen Rapid immunochromatographic test cassette which is qualitative, solid phase, two-site sandwich immunoassay for detection of hepatitis B surface antigen in serum. Results were interpreted as invalid, negative or positive.

HCV Antibody detection test- HCV antibodies were detected using Flaviscreen plus rapid immunochromatographic tests using serum samples. In this test, nano gold particles are used as agglutination agents. The results were interpreted as invalid, negative or positive.

Results

Total 70520 samples were received for HBsAg testing (Includes samples from IPD+OPD) in microbiology department at GMC, Akola. Out of 70520 samples, 1263 samples (1.79%) were positive for HBsAg. The age and sex distribution is as follows-

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Table 1: Age and sex distribution amongst patients positive for HBsAg

Age Distribution	Males positive for HBsAg	Females positive for HBsAg	Total HBsAg positive
Birth-10 years	16(1.27%)	7(0.55%)	23(1.82%)
11-20 years	33(2.61%)	69(5.46%)	102(8.08%)
21-30 years	161(12.75%)	192(15.20%)	353(27.95%)
31-40 years	117(9.26%)	96(7.61%)	213(16.86%)
41-50 years	141(11.16%)	54(4.28%)	195(15.44%)
51-60 years	98(7.76%)	56(4.43%)	154(12.19%)
61-70 years	96(7.60%)	72(5.70%)	168(13.30%)
71-80 years	39(3.09%)	16(1.27%)	55(4.36%)
Total (525)	701(55.50%)	562(44.50%)	1263(100%)

Out of 22975 samples received for HCV antibody testing, 65 samples were positive (0.28%). Amongst 22975 samples, 8 had of HBsAg and HCV co-infection. Maximum number of HCV positive cases

were in 31-40 years age group (27.69%). The age and sex distribution is as follows-

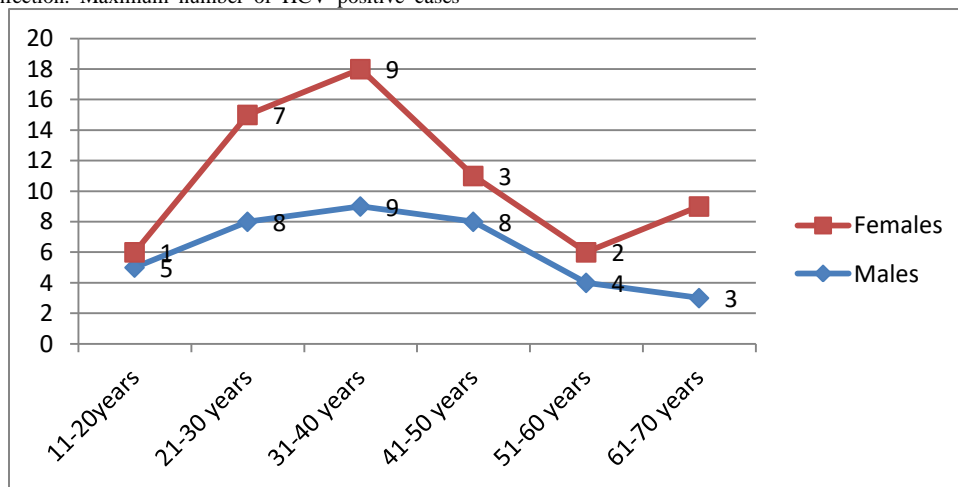


Fig 1:Age and sex distribution of patients positive for HCV antibody testing

Discussion

In present study, all the tests were done by rapid immunochromatographic testing as these tests are easily available, give results in 20 minutes, no need of expert staff. The importance of Rapid test for HBsAg has been highlighted by Safia Bibi in cases of OPD set ups and remote areas[7]. Sushmita et al have shown the importance of rapid ICT for Hepatitis C virus detection[8]. In our study, total 70520 samples were sent for HBsAg testing (Includes samples from IPD+OPD) in Microbiology department at GMC, Akola. Out of 70520 samples, 1263 samples (1.79%) were positive for HBsAg. So, seroprevalence of Hepatitis B was 1.79%. Similar prevalence was found in the study of Abhijeet Chaudhary et al(1.61%).⁹ In the study of AK Tripathi et al, Arun Ghosh et al, Aparna et al, Satish Patil et al the seroprevalence was found to be 2.25%, 4.94%, 3.61%, 2.25% respectively[10-13]. Higher seroprevalence found in these studies may be due to the fact that, samples in these studies were tested by ELISA method which are supposed to be more sensitive as compared to rapid tests. Lower seroprevalence (0.56%) was found in the study of Trupti Naik et

al[14]. Lower seroprevalence may be due to effective immunization programme, safe blood transfusion practices etc. In our study, 21-30 years age group was most commonly affected (27.95%) followed by 31-40 years (16.86%) and 41-50 years(15.44%). Similar findings were found in the study of Fawad Khan et al (34.93% cases in 21-30 years and 23.83% in 31-40 years age group).¹⁵ In the study of Disha et al 21-40 years was most commonly affected[16]. Males were more affected than females in our study(Males:Females=1.25:1). Similar findings with higher male predominance is also found in the study of Fawad Khan et al (2.14:1)[15], Disha et al (1.36:1)[16], Blumberg et al[17] In the study of Trupti Naik et al, females were more affected(61.53%) than males[14]. In present study HCV prevalence by rapid tests was found to be 0.28%. In the study of Abhijit Chaudhary et al it was 0.87%[9], AK Tripathi et al 1.61%.[12] Preeti et al 2.6%[18] Kanaya et al 5.66%.¹⁹ 31-40 years age group was most commonly infected with HCV(27.69% cases). In Abhijit Chaudhary's study, 20-39 years was most common age group and in study of Preeti et al, 40-49 years was most common age group[9,18]. In both of these studies, very few cases were found in <20 years which correlates with our study. Males were more affected than

females, this correlates with the study of Preeti et al.¹⁸ In our study, co-infection of Hepatitis B and C was found in 8 cases (0.03%). Co-infections till date have been reported more in HIV infected patients. In present study, HIV status of the patient was not seen. In study of AK Tripathi et al and Joy et al, coinfection of Hepatitis B and C with HIV was seen in 0.16% and 5% respectively.^{10,20} But these cases were HIV seropositive cases. Co-infections can lead to early damage to liver

Conclusion

Hepatitis still continues to be important viral infection. Prevalence of Hepatitis B and C was found lower as compared to other studies but increase in immunization, proper blood transfusion practices, use of sterile needles and syringes can still lower it.

Limitations of Study

All tests were done by Rapid methods which has quite low sensitivity.

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