Original Article

Survival Rate in HBV Related HCC- Experience at Tertiary Care Center of Northeren India

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Abstract

Background: Chronic hepatitis B virus (HBV) infection is a leading cause of hepatocellular carcinoma (HCC) worldwide, accounting for over 50% of cases globally. It triggers liver cancer through chronic inflammation (cirrhosis) and direct DNA integration into host cells. Antiviral therapy and vaccination significantly reduce this risk. Reducing liver-related problems, such as HCC, requires effective HBV infection prevention and control techniques. HBV contributes significantly to the development of liver cancer, and our understanding of the variables influencing its carcinogenic potential is expanding. Treatment of HBV infection in individuals with HBV-induced HCC requires special attention due to advances in HCC care. The survival rates vary significantly based on treatment and disease stage, with 5-year overall survival (OS) after radical resection ranging from 20.5% to 64%. Patients receiving curative resection often achieve 1-year survival rates over 90%, while long-term antiviral therapy (NA) is crucial to reducing mortality and recurrence. **Material and Methods:** The Medical Gastroenterology Department at PGIMS, Rohtak conducted this prospective and retrospective study over a ten-year period, from March 1, 2016, to February 28, 2026. Patients with HBV-related HCC were enrolled in the study after providing written consent. Fifty-four HBV-related HCC patients' data were examined. Data was recovered over the phone if a patient was lost to follow-up. **Results:** Males and older adults are more likely to have HBV-related H.C.C. Just 4 (7.41%) of the 54 patients were female, while 50 (92.59%) were male. On geographical distribution, there was clear cut predominance of rural background i.e. 51 patients (94.45%) resided in rural area and only 3 patients (5.55%) belonged to urban area. The number of H.C.C. patients in our study group increased with age, with 51 patients (94.45%) being older than 40. The three patients in the third and fourth decades were not cirrhotic; two had a family history of H.C.C. and both had low HBV viral loads; the third patient had chronic hepatitis B with a high viral load and developed multifocal H.C.C. without progressing to the cirrhotic stage. The remaining 51 HBV patients had cirrhosis. Out of total pool of 54 patients of H.C.C, a significant percentage of patients i.e. 25 (46.29%) had low viral load of below 40,000 I.U. or two lakhs copies/ml. The rest 29 patients (53.71%) had high HBV viral load. There was strong association with alcohol and smoking in our study group. Out of total 54 patients, 23 patients (42.59%) consumed both alcohol and smoke, 8 patients (14.81%) were only smoker and 2 patient (3.70%) were only alcoholic. Thus, in total, 33 patients (61.11%) had association with alcohol intake or smoking. Out of total pool of 54 patients, 36 (66.66%) were already diagnosed patients of HBV and were on antiviral treatment and 18 (33.33%) were diagnosed first time as HCC and on aetiological evaluation, were found to be suffering from HBV. Out of these 18 patients, 15 (83.33%) died within six months and only 3 (16.66%) are surviving till date, and all of them have been diagnosed in last one year only. In total 54 patients, 41 (75.92%) have died and only 13 (24.07%) are surviving. Out of these 13 patients who are surviving, 10 (76.92) have been diagnosed in last one year only and only 3 (23.07%) have been diagnosed in last 4-6 years. In these 13 surviving patients, 3 (23.07%) are non-cirrhotic (2 had family history, 1 had advanced fibrosis with high viral load), 6 (46.15%) had compensated cirrhosis and fibroscan improved with antiviral treatment and 4 (30.76%) had decompensated cirrhosis and out of them 2 received TACE (trans-arterial chemo immobilization) therapy. Out of 41 patients who died, only 3 survived for more than five years. Moreover, in 13 patients who are surviving, only 4 patients have been diagnosed for greater than five years and rest 8 have been diagnosed in last one year only. Thus, total five- year survival rate till date is very low i.e. 7 patients out of 54 (12.96%). **Conclusion:** HBV related HCC can be decreased by effective preventive strategies which includes safe needle practices and hepatitis B vaccination, along with judicious and regular use of antiviral drugs wherever indicated. Patients must take their medications as prescribed, and they should be forbidden from smoking and drinking alcohol, both of which raise the risk of HCC. The HCC patients with metastasis have very short survival of 3- 6 months only. The availability of advanced interventional facilities at government set up is must because majority of these patients belong to poor socio-economic status and cannot bear financial expenses of big corporate hospitals.

Keywords: HBV, Hepatocellular carcinoma, Fibroscan, Endoscopy, HBV Viral load.

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Introduction

Liver cancer which is one of the leading causes of cancer deaths worldwide,[1] and Hepatocellular Carcinoma (HCC) forms the major chunk (75% -90%) of primary liver malignancies.[2] In majority, Hepatitis B and C viruses, alcohol damage, and metabolic associated steatotic liver disease (MASLD) all contribute to the development of HCC (75% to 90%) in cirrhotic liver.[3-5] Approximately 63% more deaths worldwide have been attributed to viral hepatitis throughout the past three decades. Since hepatitis B and C infections cause patients' livers to gradually deteriorate

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and eventually develop cirrhosis and hepatocellular carcinoma, they accounted for the majority of morbidity and death.[6] HCC is more common in men and rises with age. Males are four times more likely to have it in low incidence areas and roughly eight times more likely in high prevalence areas. It could be explained by the added impact of other factors, such as increased smoking and alcohol consumption combined with a higher prevalence of cirrhosis in men. HBV-related HCC survival is strongly influenced by antiviral therapy, with 5-year overall survival rates for resected patients around 64%. Antiviral treatment with nucleotide/side analogue (Nas) significantly improves outcomes, reducing recurrence and mortality. The key factors affecting prognosis include HBV DNA levels, cirrhosis status, tumor size, and curative treatment. Studies show 1-, 3-, and 5-year cumulative survival rates of approximately 92%, 78%, and 64%, respectively. Nucleos(t)ide analogues (NAs) significantly improve 5-year survival by up to 40% compared to untreated patients. High HBV DNA levels post-surgery are independent risk factors for poor disease-free survival (DFS) and overall survival (OS).

Materials and Methods

This study, which was both prospective and retrospective, was carried out at the Medical Gastroenterology Department of PGIMS, Rohtak, over a ten-year period, from March 1, 2016, to February 28, 2026. Patients who had been diagnosed with HBV-related HCC were included in the study after providing written consent. The total HBV patient who reported in above time period for consultation was 12,000 and out of them 54 were proven to be having HCC and data pertaining to them was analyzed. Patients who had visited the Medical Gastroenterology department within the previous ten years and were found to have HBV infection by ELISA and PCR DNA, as well as HCC by Triple Phase CECT scan abdomen and AFP level, were thoroughly examined, and comprehensive records pertaining to aeitiological and epidemiological factors and clinical spectrum were gathered.Complete blood counts, liver, kidney, and thyroid function tests, serum electrolytes, coagulation parameters (PT, INR), blood sugar, autoimmune profiles, Hbs Ag, anti-HIV and anti-HCV antibodies, abdominal ultrasonography, chest x-ray PA view, and fibroscan were all performed as part of the comprehensive clinical examination and laboratory investigations.

Results

HBV-related H.C.C. is more common in older adults and men. Out of 54 patients, 50 (92.59%) were males and only 4 (7.41%) were females. On geographical distribution, there was clear cut predominance of rural background i.e. 51 patients (94.45%) resided in rural area and only 3 patients (5.55%) belonged to urban area. The number of H.C.C. patients in our study group increased with age, with 51 patients (94.45%) being older than 40. The three patients in the third and fourth decades were not cirrhotic; two had a family history of H.C.C. and both had low HBV viral loads; the third patient had chronic hepatitis B with a high viral load and developed multifocal H.C.C. without progressing to the cirrhotic stage. The remaining 51 HBV patients had cirrhosis. Out of total pool of 54 patients of H.C.C, a significant percentage of patients i.e. 25 (46.29%) had low viral load of below 40,000 I.U. or two lakhs copies/ml. The rest 29 patients (53.71%) had high HBV viral load. There was strong association with alcohol and smoking in our study group. Out of total 54 patients, 23 patients (42.59%) consumed both alcohol and smoke, 8 patients (14.81%) were only smoker and 2 patient (3.70%) were only alcoholic. Thus, in total, 33 patients (61.11%) had association with alcohol intake or smoking. Out of total pool of 54 patients, 36 (66.66%) were already diagnosed patients of HBV and were on antiviral treatment and 18 (33.33%) were diagnosed first time as HCC and on aetiological evaluation, were found to be suffering from HBV. Out of these 18 patients, 15 (83.33%) died within six months and only 3 (16.66%) are surviving till date, and all of them have been diagnosed in last one year only. In total 54 patients, 41 (75.92%) have died and only 13 (24.07%) are surviving. Out of these 13 patients who are surviving, 10 (76.92) have been diagnosed in last one year only and only 3 (23.07%) have been diagnosed in last 4-6 years. In these 13 surviving patients, 3 (23.07%) are non-cirrhotic (2 had family history, 1 had advanced fibrosis with high viral load), 6 (46.15%) had compensated cirrhosis and fibroscan improved with antiviral treatment and 4 (30.76%) had decompensated cirrhosis and out of them 2 received TACE therapy. Out of 41 patients who died, only 3 survived for more than five years. Moreover, in 13 patients who are surviving, only 4 patients have been diagnosed for greater than five years and rest 8 have been diagnosed in last one year only. Thus, total five- year survival rate till date is very low i.e. 7 patients (12.96%) out of 54.

Table 1: Showing survival percentage in HBV related HCC Patients

Total Number of HBV Related HCC Patients	Patients Who Have Died	Patients Who Have Survived
54	41 (75.92%)	13 (24.07%)

Table 2: Showing timing of diagnosis of HCC in HBV Patients

Timing of Diagnosis of HCC in HBV Patients	HBV Patients who were already on antiviral treatment	HBV status confirmed when patient presented as H.C.C
54	36 (66.66%)	18 (33.33%)

Table 3: Showing total survival time before death in total pool of HCC Patients

Time Period in which patients died	HBV (N-54)
0-6 months	23 (42.59 %)

6 months-12 months	8 (14.81 %)
1-5 yrs	7 (12.96 %)
More than 5 years	3 (5.55 %)

Table 4: Showing duration of survival in HBV Patients who directly presented as HCC

Duration of survival in patients presenting first time with HCC	HBV (N-18)
0-6 months	13 (72.22%)
6 months-12 months	2 (11.11%)
1-5 yrs	2 (11.11%)
More than 5 years	1 (5.55%)

Table 5: Showing Overall five-year survival in HBV related HCC Patients

Total HBV Related HCC Patients	Five Year Survival Rate
54	7 (12.96 %)

Table 6: Showing age distribution in total study pool of HBV related H.C.C.

AGE (YRS)	HBV (N-54)
10-20	0 (0%)
21-30	1 (1.85%)
31-40	2 (3.70%)
41-50	12 (22.22%)
51-60	16 (29.62%)
61-70	20 (37.03%)
71-80	3 (5.55%)
81-90	0 (0%)

Table 7: Showing Epidemiological factor Distribution in HBV related H.C.C.

Epidemiology	HBV (N-54)
Male	50 (92.59%)
Female	4 (7.41%)
Rural	51 (94.45%)
Urban	3 (5.55%)
Diabetes	0 (0%)
Alcohol & Smoking	23 (42.59%)
Only Smoker	8 (14.81%)
Only Alcohol	2 (3.70%)
Cirrhosis	51 (94.44%)
Non-Cirrhotic	3 (5.66%)
High HBV Viral load	29 (53.71%)
Low HBV Viral load	25 (46.29%)
Family History of HCC	8 (14.81%)
No Family History of HCC	46 (85.18 %)

Table 8: Showing Parameters Distribution in HBV Related H.C.C.

Parameters	HBV (N=54)
AST	53-370
ALT	48-410
S. Bilirubin	0.9- 12.5
S. Albumin	2.3-4.1
INR	0.96-1.85
Platelet Count	0.58- 2.1 L
S. Creatinine	0.7- 1,9
Fibroscan	6.3-75 Kpa
Viral Load	101-1011

While ALT levels ranged from 48 to 410 IU (mean 91) in the HBV group, AST levels ranged from 53 to 370 IU (mean 85). Serum albumin levels ranged from 2.3-4.1 (mean 3.40), whereas serum bilirubin levels ranged from 0.9-12.5 (3.38) mg/dl. While the platelet level ranged from 0.58 to 2.1 lakhs/mm3 (mean 1.3), the INR level varied from 0.96 to 1.85 (mean 1.36). Serum creatinine levels ranged from 0.7 to 1.9 (mean 1.3), whereas Fibroscan scores ranged from 6.3 to 75 Kpa (mean 44). The HBV viral load (mean 105) varied from 101 to 1011 IU/ml. Fifty of the fifty-four HBV patients were on monotherapy, while four were receiving dual therapy.

Discussion

HCC is a pan-cancer that ranks sixth globally and was the third most common cause of cancer-related deaths in 2020.[7] Patients with persistent HBV infection have a 44% incidence of HCC. The most significant risk factors for the development of HCC are viral hepatitis and alcohol use,[8] however alcohol-related

HCC may be more common in areas where HBV immunisation is readily accessible.[9] The increase in obesity and metabolic syndrome has made metabolic associated steatotic liver disease (MASLD) a more common risk factor for HCC.[10] It is more prevalent in men, and the typical age at diagnosis is between 50 and 70 years,[8,9] which is consistent with the 54 patients in our study group, the majority of whom were male and older than fifty. HCC is more common in men and rises with age. Males are four times more likely to have it in low incidence areas and roughly eight times more likely in high prevalence areas. It may be brought on by higher rates of smoking and alcohol consumption combined with a higher frequency of cirrhosis in men. 80% of HCC cases are found in Africa and Asia, with Asia accounting for roughly 72.5% of cases. This is believed to be caused by both their high rates of aflatoxin exposure and HBV infection.[8,9,12] Another factor is restricted access to HBV screening, immunisation, and therapy.[13] The shortest survival was seen in patients who presented with HCC and on evaluation was found to be infected with HBV. They were all cirrhotic and majority died within 6 months, due to advanced stage of disease. In comparison, patient who were on regular antiviral treatment and later developed HCC, had longer life span. The majority patient who died in latter group were smoker and alcoholic and never stopped the same, after being diagnosed with HBV. It re-in forces the detrimental and conjoined effect of both of them in causing HCC in HBV patients. The history of alcohol and smoking was seen in significant number of patients which is in accordance to other studies reported in literature, as smoking and alcohol are independent risk factors for causing HCC and when these factors are clubbed with HBV infection, then as expected risk of developing HCC rises. The rural predominance was seen because of unsafe needle practices due to of lack of trained health professionals. Only three young, non-cirrhotic patients developed HCC; two of them had a family history of HCC, and the third was in the chronic hepatitis stage with a high viral load and transaminase level. The majority of HBV patients go through the cirrhotic stage before developing HCC. This was also observed in our HBV study group. Co-infection of HBV and HCV raises the risk of H.C.C., and six HBV patients in our study group also had co-infections with HCV. The treatment approach (palliative vs. curative) and the patient's state have a substantial impact on the 5-year survival rate for HBV-related HCC. The five-year survival rate for liver cancer that is localised, meaning it only affects the liver, is approximately 38%. The five-year survival rate for regional liver cancer, which indicates that the cancer may have spread to neighbouring lymph nodes, is approximately 13%. Metastatic liver cancer is another name for distant liver cancer, which indicates the cancer has migrated to other places of the body. The survival rate is approximately 4% after five years. Patients undergoing radical (curative) resection for HBV-related HCC have a 5-year cumulative survival rate of approximately 62.6% to 64%. In some studies, 5-year overall survival (OS) rates for HBV-related HCC have been reported as high as 79% following resection. For cohorts with mixed treatments (including non-curative), the 5-year survival rate is generally lower, with some studies estimating it at approximately 8.37% to 19.5% for patients not receiving intensive treatment. Long-term antiviral therapy (e.g., nucleoside analogues) is crucial, with studies showing that patients on long-term antiviral treatment have significantly improved 5-year survival rates, sometimes higher than those without treatment by up to 40%. Despite high initial survival, HBV-related HCC has a high recurrence rate, with 5-year cumulative recurrence rates often reported around 67.0%. Out of 41 patients who died, only 3 survived for more than five years. Moreover, in 13 patients who are surviving, only 4 patients have been diagnosed for greater than five years and rest 8 have been diagnosed in last one year only. Thus, total five-year survival rate till date is very low i.e. 7 patients out of 54 (12.96%). The main reason can be presentation in advanced stage in one third of cases. Second most common cause was poor socio-economic status and non- availability of interventional radiological facilities like TACE, oncosurgeon and liver transplant surgeon at our institute. Thus, majority of patients were kept at home in advanced stage and never reached the higher center for further required interventions. The majority of patients who are surviving are those who have reached higher centers for above required interventions. We were able to retrieve the data of them by telephonic consultation.

Conclusion

HBV related HCC can be decreased by effective preventive strategies which includes safe needle practices and hepatitis B vaccination, along with judicious and regular use of antiviral drugs wherever indicated. Patients must take their medications as prescribed, and they should be forbidden from smoking and drinking alcohol, both of which raise the risk of HCC. The HCC surveillance protocol which includes six monthly ultrasonogram abdomen and alpha feto protein levels in cirrhotic, can help in timely detection and management. The HCC patients with metastasis have very short survival of 3- 6 months only. The availability of advanced interventional facilities at government set up is must because majority of these patients belong to poor socio-economic status and can not bear financial expenses of big corporate hospitals.

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Conflicts of interest

There are no conflicts of interest.

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