

Incidence of Metastatic Diseases in Hepatocellular Carcinoma (HCC) Patients Related to Hepatitis C (HCV) Hepatitis B (HBV)

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Abstract:

Hepatocellular carcinoma (HCC) is a major health issue worldwide, rating as the 6th most common malignancy and a number one motive of most cancers-associated mortality worldwide. Chronic exposure to Hepatitis B (HBV) and Hepatitis C (HCV) viruses remains an important danger thing. We analyzed clinical data of two hundred (200) HCC patients who were visiting the Outpatient Department (OPD) and those who were admitted in oncology ward at Allied Hospital, Faisalabad. A total of a hundred and sixty (160) males and forty (40) females included in this study. Hepatocellular carcinoma is high risk factor for men as compared to women on account of hormones variation as depicted in the study. Demographic analysis, approximately 60 percent of HCC development occurred among patients aged 40 to 50 years. Etiological assessment indicated an extensively higher occurrence of HCV-associated HCC, with 145 patients having chronic HCV as compared to 55 patients with HBV-related carcinoma. The clinical assessment on the time of evaluation revealed that 18 out of the 200 patients were having metastatic disorder. A vital statement becomes that 60% of the patients have been recognized with HCC prior to being aware of their underlying viral contamination, highlighting an alarming defect in early detection and disease awareness. These results highlight the high prevalence of HCV-related HCC in the population and the severe negative effect of late-stage presentation on patient survival. To mitigate these risks, there is a pressing need for systematic screening for metastasis in HCC patients, significant surveillance for hepatitis viruses inside high-hazard populations, and more suitable public focus. Furthermore, powerful healing control of HBV and HCV infections is critical to lessen the development of carcinoma and improve survival rate.

Key Words: HCC, HCV, HBV, Metastatic

Introduction:

The sixth most prevalent type of cancer, which murders a ton of individuals across the globe, is Hepatocellular Carcinoma (HCC)(Samant et al., 2021). It is mostly induced by chronic viral infections. According to World Health Organization (WHO) approximately 304 million peoples are chronically infected with viral hepatitis; about 254 million have Hepatitis B (HBV), and 50 million individuals have Hepatitis C (HCV)(Organization, 9 April 2024). Although other causes such as liver fluke infections are also contribute to the development of hepatocellular carcinoma while chronic HBV and HCV are the high-risk factors of

HCC(Shouman et al., 2025). Pakistan carries a massive portion of this international problem. It ranks as the second highest in terms of the HCV overall with approximately 8.74 million individuals infected and 4.55 million individuals with HBV(Samo et al., 2020). The local statistics reveal that the liver cancer is closely related to these viruses(Chuang et al., 2009). Researches indicates that 57.5% of HCCs in Pakistan are attributed to HCV with 80% attributed to HBV(Mansoor, 2013). The spreading of these viruses is mostly by way of inadequate medical procedures, untested blood transfusions and contaminated medical equipment.(World Health Organization, 2024) We seem the ratio of HCC is vary gender to gender, previous studies prove that males are at high risk as compared to female. In this distribution male hormone like endogenous (male sex hormone) led to cancer cells growth while female estrogen can suppress and block its proliferation.(Nevola et al., 2023)

One of the major issue regarding HCC is that it can remain asymptomatic at its initial stages.(Ayuso et al., 2018). Most patients are unaware of its presence until serious pain develops in the abdominal upper right quadrant at which point the cancer is now typically worse. The spread of cancer to other areas of the liver or even to the lungs, adrenal glands as well as lymph nodes is referred to as metastasis, and is a key factor in failure of treatment and subsequent deaths in individuals.(Molina & Valente, 2003)

In this study, the frequency of metastatic disease in HCC patients related HBV and HCV is noted. We surveyed 200 patients with HCC at Allied Hospital in Faisalabad. There were 145 with HCV and 55 with HBV in this group. A considerable portion of them, approximately 65 percent, received blood transfusions during their younger age, which is a major mode of transmission the viruses to the patient. Among the entire population, 18 patients were metastatic. In our data, it is indicated that the prevalence of HCC is higher in individuals infected with HCV as compared to individuals infected HBV in Faisalabad, Pakistan. We would like to explore further on how such viral risk factors contribute to the spread of cancer, how to determine the difficulty of diagnosing and surviving HCC.

Literature Review

Hepatocellular carcinoma is a global health issue across the world especially it is very severe particularly in Asian and African region, Pakistan is one of them due to hepatitis B and C being very common there and the fact that there is a lack of cancer treatment hospitals and unawareness in Pakistan(Munaf et al., 2014; Ullah et al., 2025). Many patients with chronic hepatitis B and C are at much greater risk for HCC, and among the countries with the highest rates of these infections, Pakistan is one of them(Munaf et al., 2014). Not surprisingly, HCC is a top cause of cancer deaths in the worldwide, and the numbers have been climbing over the last few decades. The problem is that people are not really conscious about it and people cannot afford expensive treatment while there exist few screening programs or medical resources, which frequently leads to people's discovering HCC. Many people reach up at the stage when no treatment is effective(Hafeez Bhatti et al., 2016). Research done in Pakistan is trying to get a better understanding of HCC by mapping its spread and analyzing its biological properties, identifying the risk factors, and researching the treatments and management of HCC patients. In our country, particular importance is given to surveilling liver cancer due to its frequency in places like Faisalabad. And again, in regard to determinants of its risk, we cannot ignore the part that viral hepatitis. Some studies show about 87% of HCC cases are linked with Hepatitis C causing around 68% and Hepatitis B related cirrhosis making up 22%(Parkash & Hamid, 2016). Cirrhosis is one of the primary reasons for HCC due to its different causes, and it remarkable raises the risk of HCC likelihood being that one third of cirrhosis patients eventually develop OHCC. Besides cirrhosis there are other risk factors, such as metabolic associated steatotic liver disease (or MASLD), which is becoming more prevalent globally(Li & Zhang, 2025). HCC is very prevalent in Pakistan when seen from a larger perspective. However, the issue is that there

are not enough screening programs and those that exist are not utilized by a sufficient number of peoples. If we could just do better screening for those at high risk, it could really improve survival rates. On a global scale, HCC is a highest problem in places like East Asia and Africa, with different rates depending on these regions like china is dominant with 50% cancer related deaths (Sartorius et al., 2015). Hepatitis B vaccines and better treatments for hepatitis C, we're seeing a shift in the types of cases, with more now linked to non-viral causes. Staging and treatment approach also effective.

In Pakistan, the stage and treat hepatocellular carcinoma (HCC) is pretty much in line with what's happening globally. Some of them are: When it comes to staging. There are a few systems they use:

1. **BCLCS.** The Barcelona Clinic Liver Cancer (BCLC) System is one of the most popular. It evaluates tumor size, liver function, and patient health among other factors. HCC is then classified into several stages from very early to terminal(Cho et al., 2019).
2. The Okuda System: After that, the Okuda System takes up the case where size of the tumor is determined along with fluid accumulation in the abdomen and blood tests.
3. TNM system: Finally, the TNM system calculates the size of the tumor and whether it has reached the lymph nodes or other body parts. Treatment modalities are determined according to stages(Woo et al., 2022):

❖ For very early (0 and A) stages, treatment choices include:

- Liver Transplantation, which is a preferred method and has a decent 5-year survival rate of about 75%.
- Resection, is indicated in a patient with a solitary tumor and good liver function but the survival rates in this setting are around 38-40% with 5 to 10years(Choti et al., 2002).
- Thermal Ablation is another possible treatment, which has similar outcomes as resection.

❖ For intermediate stage (B):

- Trans-arterial Chemoembolization (TACE), is often recommended for multiple tumors that have not invaded blood vessels or spread to another organ and provides survival rate 2-3 years(Ahmad et al., 2020).
- Sometimes, locoregional therapy is also an option for those with well-defined tumors.

❖ For those in advanced stage (C):

- Systemic therapy is usually recommended, which can help improve survival rate in metastatic setting.(Palumbo et al., 2013)
- Sorafenib, is one targeted treatment that's shown to help Athos with advanced HCC live longer and this is the first treatment method which approved for advance treatment for hepatocellular carcinoma.(Escudier et al., 2019)

Material and method:

Setting:	Allied Hospital, Faisalabad
Duration of study:	Six Months
Data collection:	Questionnaire based interviews of the patients
Sample Size:	Oncology ward and Outpatient Department (OPD)

This research was conducted at Allied Hospital, Faisalabad and the topic of research was "the incidence of metastatic diseases in HCC patients related to HCV or HBV". We visited the hospital for five months and collected data from HCC patients. There we interviewed the OPD of the Oncology Center and patients had HCV or HBV. We collected data from those patients who had developed HCC due to HCV or HBV. After decided the criteria of research reached we served in the hospital and asked from HCC patients they were infected due to HCV or HBV. It was found that why they had HCV or HBV. During

this research, it was found that HCV has more concerns in men. All the data we collected was from 200 patients, 145 had HCV and 55 had infected with HBV. The Metastatic stage they had was 18 patients. Then we saw the reports of all the patients who were treated from the Hospital and which tests were done. Such as CT-SCAN, MRI, AFP. There were few patients who had live biopsy. Some patients had endoscopy. And there were few patients from 200 patients who had chemotherapy. We seem some common symptoms in HCC patients like some patients who also suffered a loss emotional and mental well-being due to treatment of chemotherapy, as the hairs of these patients were removed. Due to this chronic infection unexplained Weight loss and loss of appetite (anorexia) is common in HCC patients. In addition, there were some HCV or HBV patients who were suffered with bleeding due to underlying cirrhosis. Some patients had fever but it less common.

Then we also saw some patients who did not know that they had HCV or HBV. They had stomach pain, after visiting the doctor due to stomach pain and daily fever, and they found out that they had HCV or HBV. There were a few patients who smoked cigarettes. HCV or HBV patients most were from age group of 50. After collecting the entire patient's information, the history of the patients and laboratory test data was also taken. The medical history showed that the patient had a previous condition and health record. This helped treat HCV or HBV patients. The patient's medical history also found out how the patient felt HCV or HBV before visiting the doctor. On the other side they had a family history that caused them to be HCV or HBV. From the patient's medical history, it was also found out that how his mortgage was? We collected some surgical tests data, molecular tests and liver tests data. After this, entire how much are the total number of patients who had HCC due to HCV or HBV to conclude? Who had more concerns after HCV or HBV related HCC? The total number of patients who had HCC was 200, out of which 145 were affected with HCV and 55 were affected with HBV. The number of patients on metastatic stage was 9 (18 %).

Discussion

These findings point to the fact that HCV-related HCC is a far more serious burden than that related to HBV. The virus's aggressive nature and the factors that increase the risk of HCV infection, such as cirrhosis and liver fibrosis, may account for the higher HCC incidence in patients infected with HCV. 9 out of 200 cases show metastatic disease. Bacterizing the prognosis and outcomes might result from an early diagnosis and treatment. The dominance of males, whose age's ranges from 40 to 50 years, also supports the literature that HCC occurs mainly in older adults, particularly in older men. The striking figure that 60% of patients were unaware of their viral infections at the time of HCC diagnosis emphasizes the need for routine screening of hepatitis viruses in high-risk populations.

Results

Total 200 patients diagnosed with hepatocellular carcinoma (HCC) were enrolled in this study, 145 patients (72.5%) were diagnosed with HCC due to chronic infection with HCV, while 55 patients (27.5%) had HBV-related HCC. The incidence of HCC is very high in patients have HCV compared to those having HBV. This finding is unchanging with existing literature that put forward HCV is a more vigorous risk factor for the spread of HCC.

Demographics:

Out of the 200 patients enrolled in the study, 160 (80%) were male and 40 (20%) were female. The age distribution revealed that the majority of patients (60%) developed HCC between the ages of 40 and 50 years. The demographic characteristics of the study population are summarized in tables.

Table No. 1: Gender distribution of patients:

Total patients	200
Male	160 (80%)
Female	40 (20%)

Table No. 2: The age group of patients:

Age Group	Number of individuals
1 to 19 years	0
20 to 39 years	19
40 to 59 years	120
60+	61

Table no. 3: Total number of patients 200 having HBV and HCV related HCC:

Category	Number of patients adopted HCC	Metastatic disease 18 (9%)
HCV	145 (72.5%)	12
HBV	55 (27.5%)	6

Table No. 4: Distribution of HCV Genotypes in Registered and HCC Cases

Initial Liver Biopsy	HCV Genotype					
	I	II	III	IV	Not detected	Total
Registered	0	63	15	6	16	100
HCC	0	7	2	0	0	9

Table No. 5: Distribution based on aware and unaware about HCC among patients:

Comparison	Number of individuals
Aware about infection	120 (60%)
Unaware about infection	80 (40%)

Viral Infection Status:

Among the 200 patients, 145 (72.5%) had concomitant HCV infection while 55 (27.5%) had HBV infection. The incidence of HCC was significantly higher in the HCV group compared to the HBV group.

Metastatic Disease:

Eighteen participants (9%) were found to have metastatic disease at the time of HCC diagnosis. Specifically, 12 out of 145 HCV patients (8.3%) had metastasis while 6 out of 55 HBV patients (10.9%) exhibited metastatic disease.

Gender Distribution:

A total of 160 males (80%) and 40 females (20%) participated in the study. The occurrence of metastatic disease was a bit more in the male patients; out of the 18 patients with metastasis, 15 were males (83.3%). This corresponds to older investigations that show a larger number of males getting HCC, (Jiang et al., 2026) which could probably because they drink and smoke more than females.

Age Distribution:

The age distribution of patients diagnosed with HCC shows that the majority of patients (60%) developed HCC before they were aware of their condition, with the highest incidence

observed in the age group of 40 to 50 years. The data shown that HCC is an early disease in middle-aged and older adults, make it a point the need for pointing or diagnose in these age peoples.

Awareness of Viral Infection:

The findings indicated a clear trend of late diagnosis in which about 60% of participants did not know they were infected with the virus at the time of being diagnosed with HCC. Delayed presentation is particularly concerning, given the highly advanced disease and poor outcomes. The delay is likely compounded by the fact that many patients only had distal and vague symptoms including fatigue, weight loss, and abdominal discomfort-which can easily be dismissed.

Data Analysis

Recommendations

Based on our findings, we suggest the following:

Treatment of HBV and HCV: Early detection and Treating the HBV or HCV infection is play an important rule to reduce the risk of new HCC or metastasis.

Regular screening for metastasis: It is essential that patients with HCV and HBV-related HCC be followed up regularly for metastatic disease to facilitate early detection and treatment.

Personalized treatment plans: Treatment plans should be individualized based on the patient's liver disease, tumor characteristics, and general health.

Targeted therapies: Targeted therapies that attack on specific molecular pathways in the progression and metastasis of HCC may be helpful for patients with HCV- and HBV-related HCC.

More research: n mechanisms of metastasis in HCV and HBV related HCC should therefore be done so that effective treatments may be developed.

Clinical Implications

Improved patient outcomes: By understanding the incidence of metastatic disease in HCV and HBV related HCC patients; clinicians can develop more effective treatment plans and improve patient outcomes.

Reduced healthcare costs: Early detection and treatment of metastatic disease can reduce healthcare costs associated with advanced disease.

Enhanced patient care: A multidisciplinary approach to care our enhance patient care and improve quality of life for patients with HCV and HBV related HCC.

Future Directions:

Prospective studies: Prospective studies are required to confirm the findings and estimate more precisely the incidence of metastatic disease in HCV- and HBV-related HCC patients.

Biomarker research: Research in biomarkers that predict metastasis in HCC patients will indicate which patients are at high risk and may help in early detection and treatment plans.

Personalized medicine: The development of personalized medicine approaches incorporating individual patient characteristics and tumor biology may represent a step forward in improving outcomes in patients with HCV and HBV related HCC.

Conclusion

Our study disclosed a crucial feature of Hepatocellular carcinoma (HCC) in patients having Hepatitis C (HCV) and Hepatitis B (HBV), they are at the risk of metastasis. We found that a notable number of patients with HCV and HBV related HCC develop metastatic disease which significantly effects on their survival and quality of life. This highlights the importance of early detection and treatment of HCC as well as effective management of the

underlying viral infection. We can design more effective diagnosis plan and the measurable results of healthcare interventions that can mitigate and reduce the risk of HCC and Metastasis.

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