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Research Article

HBV AND LUNG CARCINOMA- AN ASSOCIATION OR CO-INCIDENCE

Parveen Malhotra[1], Ankit Chahal[2], Rahul Siwach[3], Bibin CF[4], Priya Sharma[5], Abhishek Yadav[6]

[1]Department of Medical Gastroenterology, PGIMS, Rohtak, Haryana, India

*Corresponding Author
Parveen Malhotra, 128/19, Civil Hospital Road, Rohtak, Haryana, India (124001).

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Abstract: *Introduction:* Hepatitis B virus (HBV) infection is a leading cause of chronic liver disease and liver cancer worldwide. Hepatocellular carcinoma (HCC) remains one of the major causes of cancer-related mortality globally. While chronic Hepatitis B Virus (HBV) primarily drives hepatocellular (liver) cancer, medical studies show it is also an independent risk factor for a poorer overall prognosis in patients with advanced Non-Small Cell Lung Carcinoma (NSCLC). The management of lung cancer in HBV carriers requires strict antiviral oversight. Research indicates that NSCLC patients who are positive for the Hepatitis B surface antigen (HBsAg) face shorter overall survival (roughly 11.3 months) compared to HBsAg-negative patients (about 12.6 months). Lung cancer treatments, particularly targeted therapies like Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitors (EGFR-TKIs) and certain chemotherapies can suppress the immune system, leading to dangerous HBV reactivation. Oncology guidelines mandate starting antiviral prophylaxis (e.g., entecavir or tenofovir) before initiating TKI therapy or heavy systemic chemotherapy in HBV carriers or those with resolved infection.**Case Report-** We report a sixty- two--year-old male, not a known case of any chronic illness, chronic smoker presented with fever associated with cough for last one week. On routine evaluation, he was detected to be HbsAg positive. His general physical examination was essentially normal except for febrile on touching. His systemic examination regarding cardiological, per-abdomen and neurological was normal. The chest examination revealed dullness on percussion in right middle and lower lobe. The ultrasonogram revealed a lesion in middle and lower lobe? Pneumonitic. All his biochemical investigations including complete hemogram, liver and renal function tests, complete lipid and thyroid profile, blood sugar, HbA1C, urine complete examination, ECG, ultrasonogram abdomen were normal. The Fibroscan score was 5.2 Kpa, suggestive of non-cirrhotic pattern. The upper gastro-intestinal endoscopy was normal without any evidence of varices or portal hypertensive gastropathy. The HBV DNA viral load was also low i.e. 2 x 10 3 I.U./ml. The contrast enhanced computed tomography scan was done which showed a well-defined heterogeneously enhancing soft tissue lesion in right middle and lower lobe of 13 cm x 10 cm x 10 cm which was abutting pleura (neoplastic lesion). The lesion had central necrotic areas with air foci and medially was reaching left mediastinum and left heart border. The lesion was reaching to segment 7 of right lobe of liver, having a heterogeneously enhancing lesion of 5.3 cm x 4.5 cm with internal necrotic component (metastasis). Multiple heterogeneously enhancing enlarged mediastinal lymph nodes with; largest of 3.3 cm x 2.4 cm was seen. There was no evidence of pleural effusion, pneumothorax or pneumomediastinum. Laterally lesion was extending up to lateral chest wall with suspicious pleural involvement and focal loss of fat planes with intercostal muscles and involvement of fourth and fifth intercostal spaces with no obvious rib erosions. The final impression given was neoplastic lesion of lung, most likely squamous cell carcinoma with metastasis into liver and mediastinal lymph nodes. PET scan and biopsy of lung lesion was advised by radiologist for final confirmation. Patient was started on antiviral as chemoprophylaxis because he was supposed to be started on chemotherapy in near future. He was advised for further testing but left against medical advice due to personal reasons. **Conclusion-** HBV is always thought to be associated with HCC predominantly but extra-hepatic malignancies are also reported but to lesser extent. The lung carcinoma with metastasis to liver in background of chronic HBV is co-incidence or there is some association, is area of further research.

Keywords: HBV, Hepatocellular carcinoma, Lung carcinoma, CECT Scan, Smoke, HBV Viral load

INTRODUCTION

HBV infection is one of the most serious and prevalent health conditions, affecting more than 2 billion people worldwide. [1] Hepatitis B virus has been implicated in the cause of up to 80% of cases of hepatocellular carcinoma (HCC), which frequently occurs in Chinese and African populations. [2] The virus optimizes its life cycle to allow for long-term persistence in liver tissue by establishing a plasmid-like covalently closed circular DNA (cccDNA) form. [3] Chronic HBV infection persisting in liver tissue is associated with increased chronic oxidative damage in hepatocytes, immune-mediated inflammation of the liver, and development of cancer. [4] A few clinical case studies detected HBV in several types of non-liver tissues, suggesting a potential role of HBV in the oncogenesis of non-liver cancers. [5-7] Few population-based prospective studies have observed associations between chronic HBV infection and various non-liver cancers, but these findings were inconsistent. [8-12] The cancers associated are cholangiocarcinoma, pancreatic carcinoma and non-hodgkin lymphoma but carcinoma lung has not been reported in literature. There is no direct medical evidence

showing that HBV causes lung carcinoma. HBV is a hepatotropic virus, meaning it primarily infects and causes disease in the liver, making it a major risk factor for HCC. While HBV does not directly trigger lung cancer, the connection between the two often involves secondary complications or shared risk factors. Lung tumours found in patients with Hepatitis B are frequently metastatic cancers (cancer that has spread to the lungs) rather than primary lung carcinomas. Because HBV can cause cirrhosis and liver cancer, these cancers can metastasize and spread to the lungs.

CASE REPORT

We report a sixty- two--year-old male, not a known case of any chronic illness, chronic smoker presented with fever associated with cough for last one week. He developed persistent hiccoughs after one day of admission. On routine evaluation, he was detected to be HbsAg positive. His general physical examination was essentially normal except for febrile on touching. His systemic examination regarding cardiological, per-abdomen and neurological was normal. The chest examination revealed dullness on percussion in right middle and lower lobe. The ultrasonogram revealed a lesion in middle and lower lobe? Pneumonitic. All his biochemical investigations including complete hemogram, liver and renal function tests, complete lipid and thyroid profile, blood sugar, HbA1C, urine complete examination, ECG, ultrasonogram abdomen were normal. The Fibroscan score was 5.2 Kpa, suggestive of non-cirrhotic pattern. The upper gastro-intestinal endoscopy was normal without any evidence of varices or portal hypertensive gastropathy. The HBV DNA viral load was also low i.e. 2 x 10^{3} I.U./ml. He was started on broad spectrum antibiotics, along with proton pump inhibitors and prokinetics. He remained febrile but repeat complete hemogram also not showed any evidence of leucocytosis. In view of no significant clinical recovery, his chest x-ray was repeated which showed non-resolution of lesion. Hence, contrast enhanced computed tomography scan was done which showed a well-defined heterogeneously enhancing soft tissue lesion in right middle and lower lobe of 13 cm x 10 cm x 10 cm which was abutting pleura (neoplastic lesion). The lesion had central necrotic areas with air foci and medially was reaching left mediastinum and left heart border. The lesion was reaching to segment 7 of right lobe of liver, having a heterogeneously enhancing lesion of 5.3 cm x 4.5 cm with internal necrotic component (metastasis). Multiple heterogeneously enhancing enlarged mediastinal lymph nodes with; largest of 3.3 cm x 2.4 cm was seen. There was no evidence of pleural effusion, pneumothorax or pneumomediastinum. Laterally lesion was extending up to lateral chest wall with suspicious pleural involvement and focal loss of fat planes with intercostal muscles and involvement of fourth and fifth intercostal spaces with no obvious rib erosions. The final impression given was neoplastic lesion of lung, most likely squamous cell carcinoma with metastasis into liver and mediastinal lymph nodes. PET scan and biopsy of lung lesion was advised by radiologist for final confirmation. Patient was started on antiviral as chemoprophylaxis because he was supposed to be started on chemotherapy in near future. He was advised for further testing but left against medical advice due to personal reasons.

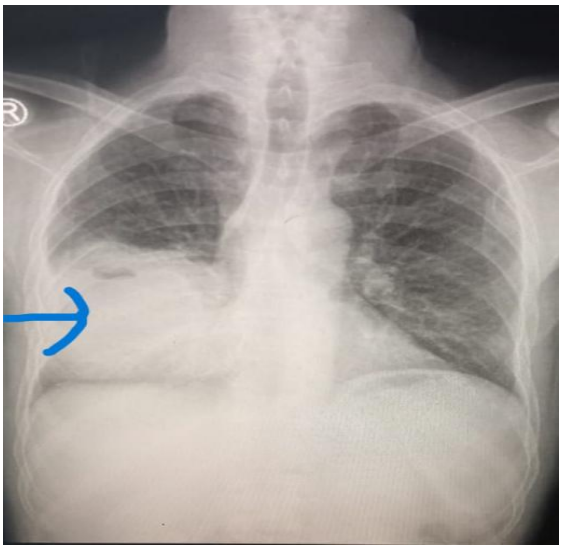

Figure 1- Chest X-ray Showing Mass lesion in Right Lung (blue arrow)

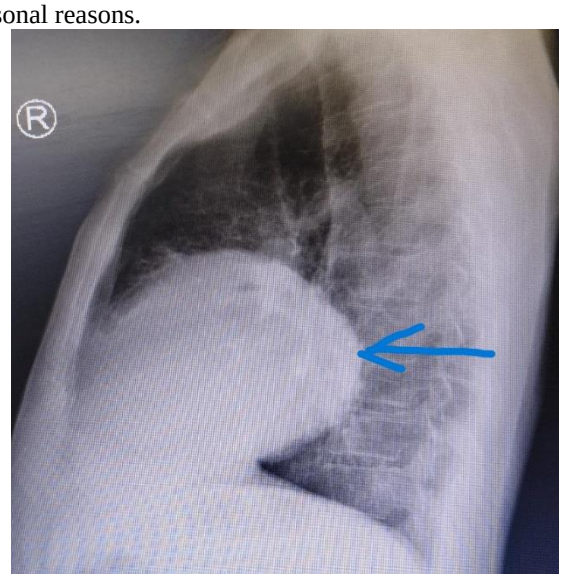

Figure 2- Chest X-ray lateral view showing mass lesion (blue arrow)

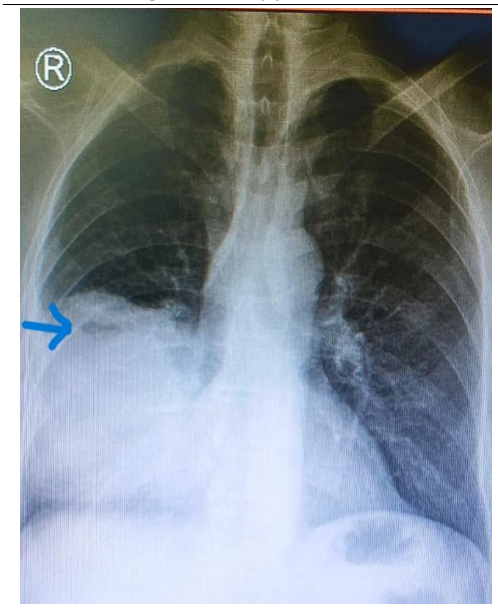

Figure 3- Chest X-ray showing non-resolution of lesion with air in it (blue arrow)

Figure 4- CT scan showing mass lesion in lung (blue arrow) and metastasis in liver (red arrow)

DISCUSSION

Our case had confusion whether it was lung carcinoma has metastasized to liver or it was vice-versa. The points against primary lesion in the liver were non-cirrhotic background, with low HBV viral load. Metastatic lesion in liver. The primary lesion in lung was of much bigger size, in comparison to Smoking is no doubt associated with both lung and liver carcinoma. The lesion was neoplastic and not pneumonitic is suggested by repeated normal leucocyte count, non-resolution of fever and mass lesion on x-ray with broad spectrum antibiotics because it was due to malignancy. The persistent cough and hiccoughs were most likely due to involvement of pleura and diaphragm by malignancy. The biopsy and PET scan could have helped in clinching the final diagnosis but before that patient left. Chronic Hepatitis C virus (HCV) infection is associated with up to a 1.9-fold increased risk of developing lung carcinoma. While its primary target is the liver, acting as a known carcinogen linked to hepatocellular carcinoma, HCV can cause systemic, chronic inflammation and oxidative stress, which may contribute to the development of extrahepatic cancers. Systematic reviews and meta-analyses suggest that chronic HCV infection is significantly associated with an increased relative risk of lung cancer. [13] Till date, there are no case reports or systematic meta-analysis regarding association between HBV and lung carcinoma. Our case report is co-incidence or beginning of highlighting the association between the two, will be answered in future researches.

CONCLUSION

HBV is always thought to be associated with HCC predominantly but extra-hepatic malignancies are also reported but to lesser extent. The lung carcinoma with metastasis to liver in background of chronic HBV is co-incidence or there is some association, is area of further research.

CONFLICT OF INTEREST- The authors declare that there was no conflict of interest during this research study.

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