

Liver Cancer Detection and Treatment

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Abstract: Globally, liver cancer is the most frequent fatal malignancy; in the India, it ranks fourth. Patients are often diagnosed with liver cancer in advanced stages, contributing to its poor prognosis. Of all liver cancer cases, >90% are hepatocellular carcinomas (HCCs) for which chemotherapy and immunotherapy are the best options for therapy. For liver cancer patients, new treatment options are necessary. Use of natural compounds and/or nanotechnology may provide patients with better outcomes with lower systemic toxicity and fewer side effects. Improved treatments can lead to better prognoses. Finally, in this review, we present some of the problems and current treatment options contributing to the poor outcomes for patients with liver cancer.

Keywords: Liver cancer, natural compound, immunotherapy, chemotherapeutics

INTRODUCTION

This cancer starts in the liver when cells grow and divide abnormally. There are two ways this can happen. The first is when the cancer starts in the liver itself, also known as primary liver cancer. Another way is when cancer spreads from other organs to the liver, where the cancer may have first started. This is called metastatic liver cancer. There are several types of primary liver cancer, the most common of which is hepatocellular carcinoma (HCC). Other types of liver cancer include intrahepatic cholangiocarcinoma, hepatoblastoma, angiosarcoma, and hemangiosarcoma.

IS LIVER CANCER CURABLE?

Liver cancer treatment depends on various factors. This includes stage, location, whether primary or secondary, general health etc. Liver cancer is often diagnosed in the late stages, where, unfortunately, treatment becomes difficult. If you have early-stage liver cancer, the chances of success are higher. However, in the later stages, treatment focuses on limiting symptoms to prolong your life. Moreover, every liver cancer is difficult to treat. Primary does not leave any symptoms in the early stages as a result of which liver cancer progresses. In addition, secondary

liver cancer spreads to multiple organs, resulting in complicated surgery.

WHAT CAUSES LIVER CANCER

Cancer begins when mutations occur in DNA. These mutations can result in abnormal cell growth, forming tumors. In some cases, chronic infection can also be the cause of liver cancer. However, some people can develop liver cancer even without an active underlying disease. Also, certain risk factors can increase the chances of liver cancer. These risk factors include:

- 1) Fatty liver
- 2) Cirrhosis of the liver
- 3) Chronic liver infections such as hepatitis B and C
- 4) Diabetes
- 5) Excessive alcohol consumption
- 6) Exposure to chemicals such as aflatoxin
- 7) Obesity

STAGES OF LIVER CANCER

Knowing the stage of liver cancer tells the doctor how far the cancer has spread in the body, how serious it is and helps them make the best decision. To get an accurate diagnosis of liver cancer, the doctor performs biopsies, CT scans, MRIs, etc.

Also, different doctors may use different staging processes. Cancer staging is a complex process, but at its simplest, it involves four. Stages of liver cancer:

Stage 1: Tumor in the liver.

Stage 2: One or more tumors are found in the liver or have spread to nearby blood vessels.

Stage 3: In this stage, multiple tumors are present. A tumor can be about 5 cm. Here, the cancer has also spread to large blood vessels, other organs, or lymph nodes.

Stage 4: Cancer has spread to other parts of the body, such as other organs or lymph nodes.

SYMPTOMS OF LIVER CANCER

Often, there are no early symptoms of liver cancer. Signs and symptoms of liver cancer do not occur until it reaches its late stages. Some symptoms may include:

- 1) Abnormal weight loss
- 2) Loss of appetite
- 3) Upper abdominal pain
- 4) Nausea and vomiting
- 5) Black urine
- 6) fever
- 7) Abdominal swelling
- 8) Bloating

It is not certain whether these symptoms indicate liver cancer. If you experience such symptoms, consult a specialist.

TREATMENT OF LIVER CANCER

Liver cancer treatment depends on specific criteria. After knowing the stage and location, your doctor will choose one. Treatment for you may include:

- 1) Total hepatectomy or liver transplant: replacing the diseased liver with a donor liver
- 2) Partial hepatectomy: Removal of part of the liver
- 3) Chemotherapy: Cancer cells are killed with drugs and injections.
- 4) Immunotherapy: Here, your immune system is stimulated to fight cancer.
- 5) Targeted drug therapy: Here, cancer cells die after blocking abnormalities in the cancer cells.
- 6) Radiation therapy: High-energy sources from X-rays and protons are used to kill cancer cells.

There may be someone else. Treatments vary with costs that your doctor will prescribe based on your condition.

Some of the treatments depend on the cause of the liver cancer.

CONCLUSION

Liver cancer detection and treatment remain critical challenges in global healthcare, demanding a multidisciplinary and innovative approach. The asymptomatic nature of early-stage liver cancer and the limitations of traditional diagnostic methods underscore the urgent need for advanced detection techniques. Emerging technologies, such as liquid biopsies, artificial intelligence in imaging, and molecular diagnostics, offer promising solutions for

earlier and more accurate diagnosis. Treatment strategies for liver cancer must be tailored to the stage of the disease and the patient's overall health. Surgical resection and liver transplantation provide curative options for early-stage disease, while locoregional therapies like TACE and systemic treatments, including immunotherapy and targeted therapies, play pivotal roles in managing intermediate to advanced stages. The advent of immune checkpoint inhibitors and tyrosine kinase inhibitors has expanded the therapeutic arsenal, improving survival outcomes and quality of life for many patients. To further enhance liver cancer management, a focus on prevention is essential. Efforts should prioritize hepatitis B and C vaccination programs, early screening for high-risk populations, and public health interventions to address modifiable risk factors such as alcohol abuse and obesity. Personalized medicine, integrating genomic and proteomic insights with clinical practice, holds great promise for optimizing treatment efficacy and minimizing side effects. In conclusion, addressing liver cancer requires a cohesive strategy combining technological innovation, effective prevention measures, and patient-centered care. Ongoing research and collaboration among healthcare providers, researchers, and public health organizations are vital for reducing the global burden of this devastating disease.

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