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BIOMARKER DISCOVERY AND APPLICATION TO MAKE EASY DIAGNOSIS AND TREATMENT OF LIVER CANCER

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ABSTRACT

Liver cancer (also known as hepatic cancer) is cancer that takes place in the liver[1].Liver cancer can be of two types primary that starts in the liver or secondary means cancer which has spread from other organ then to liver which is also called liver metastasis. Liver metastasis occurs more commonly than that which starts in the liver [3]. Liver cancer is nowadays increasing [8][9]. As in case of many cancers the patient's survival chances gets more if` it is detected early. The median survival chances of the patients with early detected HCC is >60 months and <15 months when detected at the later stage. At the early detection of HCC the blood-based biomarkers are available with adequate specificity or sensitivity. However, some are 10 most commonly used biomarker for HCC, e.g. alpha-fetoprotein (AFP), has inadequate performance. Sweating, jaundice, stomach pain, weight loss, and liver enlargement are just a few of the signs and symptoms of liver cancer, which is really an umbrella term for many different types of cancer. Nevertheless, several of the most widely used biomarkers for HCC, such alpha-fetoprotein (AFP), perform poorly. Liver cancer, which is actually an umbrella term for many distinct types of cancer, can manifest as a number of symptoms, including weight loss, stomach pain, liver enlargement, jaundice, and sweating.[11].

KEYWORDS

Liver metastasis, alpha-fetoprotein, liver cirrhosis, biomarker,

sensitivity

INTRODUCTION

Hepatocellular Carcinoma (HCC) is like a unique malignancy, as it is typically arises as chronic liver disease in particular cirrhosis, with the risk of liver failure, leads to its low 5-year patients survival rates of 18%–20% (2). Early-stage patients can get curative therapies such as liver transplantation, ablative medicines, and resection, but late-stage patients are typically only eligible for palliative systemic therapies. Consequently, patients with early-stage HCC have a 5-year survival rate of about 70%, but patients with advanced (later stages) have a survival rate of fewer than 5%(6,7). However, due to poor utilization of the surveillance, there are inadequate surveillance methods, and have lack of risk-based strategies for most patients are diagnosed at later stages (8). Patients who are 11 at risk for HCC, such as those with cirrhosis of any kind and specific groups with long-term HBV infection, should be monitored for the condition with Guidelines recommend HCC surveillance with the abdominal ultrasound with or without serum alpha-fetoprotein (AFP) measurement at every 6 months (9,10). A biomarker can be any quantifiable material, structure, or activity that can be used to detect or predict an appropriate course of a disease. This definition is quite broad. It is proposed by the Pep and colleagues with Finding biomarkers requires multiple stages, from early to routine clinical use,. 1 the Early Detection Research Network (EDRN) of the NCI (16). The first step toward clinical validation in case-control studies is to compare early-stage case data. Late-stage validation studies assess the biomarker's effectiveness in clinical settings and ascertain its contribution to lowering the incidence of cancer within a population. Very few biomarkers in HCC which have undergone adequate validation that is They have limited clinical use because there aren't enough large prospective cohorts with appropriate follow-up and outcome durations (early-stage HCC). We now discuss 1 the NCI EDRN Hepatocellular Carcinoma Early Detection Strategy (HEDS) study and the ongoing prospective cohort studies that are intended to get past this obstacle (17).

AFP

AFP is the one which is most commonly used biomarker which is used among the first to be clinically validated as a biomarker for HCC early detection. As for societal guidelines for

HCC surveillance, biomarkers similar to AFP are currently excluded because of limited sensitivity and concerns regarding specificity in detecting early-stage HCC.

Osteopontin

It is which can mediate cell signaling involved with the regulating tumor progression.. Additionally, an evaluation of HCC early detection revealed a sensitivity of 49% and a specificity of 72% that were both on par with the effectiveness of AFP alone. If we combine with AFP the sensitivity improved to 73% and 1 little change in the specificity 68%

Glypican-3

Glypican-3, or GPC-3, is a sulfate present on the cell surface that controls both tumor suppression and cell proliferation. The sensitivity of GPC-3 for early HCC detection is only about 55% when used alone, but rises to 76% when combined with AFP, according to a meta-analysis of biomarkers. Primarily, there was a dearth of information on early-stage HCC detection. With its current >95% specificity, GPC-3 may be used as a supplemental biomarker to boost the sensitivity of AFP or other serum biomarkers.

Alpha-1 fucosidase

The next is Alpha-1fucosidase(AFU) that is a enzyme which has been shown in HCC patients. AFU's sensitivity and specificity in the early detection of HCC were 56% and 69%, respectively, in one biomarker with early-stage HCC. AFP and AFU together do not increase sensitivity. If illnesses like hypothyroidism, pancreatitis, and diabetes also exhibit AFU expression. But in 85% of patients, the AFU activity was increased at least half a year prior to the discovery of HCC.

Cell carcinoma antigen

The carcinoma antigen (SCCA) is The inhibitor of serine protease present in epithelium. SCCA is expressed as epithelial cells and in which it promotes the growth of tumor and there is inhibition of apoptosis HCC is detected by the SCCA-immune complex. In terms of HCC and cirrhosis, SCCA has a poor specificity of 50% and a high sensitivity of 89% for The subsequent glycoprotein found to be changed in patients with HCC. As Although each marker's performance is limited, as it is with other glycoprotein markers, 1 when

combined with AFP and other clinical factors, these markers can achieve sensitivities that are ne protein analysis in liver fibrosis patients based on the presence of antibodies. Although direct mass spectrometry-based methods have shown promise, they still need to be simplified and refined before being used on a regular basis in clinical setting early 80% at 95% HCC.

DISCUSSION

The aims of HCC biomarker is to find novel molecules, and making the best use of the ones that already exist in order to identify the illness earlier in populations that are at risk and to potentially forecast the course and outcome of the disease, as well as provide prognostic information. At that time the process needs to make patients safe with unnecessary testing and follow-up. Only a fraction at-risk population will develop the disease. Rapid and minimally invasive assessment of patients at risk is possible with serum biomarkers like AFP. Many other serological markers, including GP73 and GPC3, exist, according to this article. Additionally, a meta-analysis for another intriguing biomarker shows that these have no benefit over AFP alone. They may require to be combined with other markers such as albumin so that their performance got increased. Micro-RNAs are employed as prognostic or diagnostic instruments and may also be therapeutic targets for patients with HCC. It appears that plasma, the medium of platelet degradation during the clotting process, contains higher concentrations of mi-RNAs than serum does. These findings need more investigation and are still preliminary.

CONCLUTION

In conclusion the promise of the requirement to detect HCC early cannot currently be met by any one of the several classes of biomarkers. Comparable analyses may also be beneficial for patients undergoing chemotherapy or curative resection. In specified at-risk populations, a variety of trials are necessary for future prospects.

REFERENCES

1. A, P (Sep–Dec 2012). "Prostatic specific antigen and bone scan in the diagnosis and follow-up of prostate cancer. Can diagnostic significance of PSA be Journal of Nuclear Medicine.15 (3): 241–246.

2. S, Hoekstra HJ (April 2012). "The current status of S-100B as a biomarker in melanoma". European Journal of Surgical Oncology. 38 (4): 281–285.

3. Ludwig JA, Weinstein JN (November 2005). "Biomarkers in cancer staging, prognosis and treatment selection". Nature Reviews. Cancer. 5 (11): 845–856.

4. Wang Q, R, Wu J, Hwang HJ, Papadopoulos N, L, et al. (February 2011). "Mutant proteins as cancer-specific biomarkers". Proceedings of the National Academy of Sciences of the United States of America. 108 (6): 2444–2449.

5. Jump up Li X, Ye M, Zhang W, Tan D, N, Yang X, Z (February 2019). "Liquid biopsy of circulating tumor DNA and biosensor applications". Biosensors & Bioelectronics. 126: 596–607.

6. NCI Dictionary of Cancer Terms. National Cancer Institute. 2011-02-02.

7. "Biomarkers in Cancer: An Introductory Guide for Advocates" (PDF). Research Advocacy Network. 2010. Archived from the original (PDF) on 2013-10-29. Retrieved 26 April 2013.

8. M, U (October 2006). "Genetic and epigenetic biomarkers in cancer diagnosis and identifying high risk populations". Critical Reviews in Oncology/Hematology. 60 (1): 9–18.

9. Lapin M, S K, Buhl T, H, et al. (November 2018). "Fragment size and level of cell-free DNA provide prognostic information in patients with advanced pancreatic cancer". Journal of Translational Medicine. 16 (1): 300.

10. TA, Colombo F (April 2020). "Biomarkers for Early Cancer Diagnosis: Prospects for Success through the Lens of Tumor Genetics". 42 (4): e1900122.

11. M, et al. (March 2010). "High levels of serum TIMP-1 correlate with advanced disease and predict for poor survival in patients with multiple myeloma treated with novel agents". Leukemia Research. 34 (3): 399–402.

12. J (September 1996). "Loss of estrogen receptor in recurrent breast cancer is associated with poor response to endocrine therapy". Journal of Clinical Oncology. 14 (9): 2584–2589.

13. Harris Taube S, et al. (November 2007). "American Society of Clinical Oncology 2007 update of recommendations for the use of tumor markers in breast cancer". Journal of Clinical Oncology. 25 (33): 5287–5312.

14. C, Schumacher M,(January 2006). "Prognostic and predictive factors in high-risk primary breast cancer patients". Clinical Cancer Research. 12 (1): 159–168.

15. GD, van AT, Garrett CR, Shah MH, J, et al. (October 2006). "Efficacy and safety of in patients with advanced gastrointestinal after failure of a controlled trial". Lancet. 368 (9544): 1329–1338.

16. RS, Hermann R, L, Johnson BE, Sandler A, et al. (September 2005). "TRIBUTE: a phase III trial of hydrochloride (OSI-774) combined with chemotherapy in advanced non-small-cell lung cancer". Journal of Clinical Oncology. 23 (25): 5892–5899.

17. Lynch TJ, Bell DW, RA, BW, et al. (May 2004). "Activating mutations in the epidermal growth factor receptor underlying responsiveness of non-small-cell lung cancer to (PDF). The New England Journal of Medicine. 350 (21): 2129–2139.

18. Sawyers CL (April 2008). "The cancer biomarker problem". Nature. 452 (7187): 548–552.

19. I (August 2009). "Individualization of and beyond".10 (8): 1309–1322.

20. EY, et al. (December 1999). locus". Journal of the National Cancer Institute. 91 (23): 2001–2008.

21. Schneider JE, (November 2012). "Economics of cancer biomarkers". Personalized Medicine. 9 (8): 829–837.

22. R, Burg G (1997). "Serum S100--a marker for disease monitoring in metastatic melanoma". Dermatology. 194 (3): 208–212.

23. R (July 2004). "S100 proteins as cancer biomarkers with focus on S100B in malignant melanoma". Clinical Biochemistry. 37 (7): 512–518.

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