

Biomarker, A Preventive Measure to Save Physical and Mental Effects of Late Diagnosis of Disease

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ABSTRACT

In order to identify fatal illnesses, certain trials or examinations are required. Many facilities are available these days for diagnosing a variety of chronic illnesses, including as cancer, TB, keratin level (dialysis), coronary artery disease, and so on. However, postponing the diagnosis of emergency cases that need immediate treatment can result in negative consequences. The process of early disease detection starts with a particular test, and the subsequent stages are dictated by the positive or negative findings of the test. The terrible reality of modern medical technology is that there is a dearth of cutting-edge doctors who can aid patients in accurately diagnosing their sickness so that it may be treated as soon as possible. As a consequence, HKU researchers created a "Biomarker" that is now extensively used for physicians, epidemiologists, and neuroscientists to evaluate the severity of sickness and provide information on its genesis and treatment. Biomarkers have the potential to turn physicians' and scientists' dreams into reality, allowing clinicians to identify people who are at high risk of illness and take preventive measures to save their lives in a timely manner.

Keywords: Detect, Diseases, Early Stage, Biomarker, Patient, Screening, Survival, Tests.

1. INTRODUCTION

This is apparent that postponing the diagnosis of a severe illness would result in negative consequences, causing disease treatment to be less effective and decreasing the odds of a patient's survival. Based on a studied research, in India, 12.5 percent of individuals seek treatment for their illness early on, while 70 percent of cancer deaths are caused by late diagnosis. As a consequence, detecting serious diseases early improves the odds of survival and treatment. When a sickness is detected early, it means the person has not yet developed any indications or symptoms of the disease [1]. Many capabilities for identifying chronic illnesses such as cancer, keratin level (dialysis), TB, coronary artery disease, etc. are now available. Early sickness testing is usually disregarded until the second stage. Early illness identification begins with a specific test, and the results of that test, whether positive or negative, determine the subsequent steps [2].

As a consequence, detecting serious diseases early improves the odds of survival and treatment. When a sickness is detected early, it means the person has not yet developed any indications or symptoms of the disease [3]. Many facilities are now accessible for detecting chronic diseases like as cancer, tuberculosis, keratin level (dialysis), coronary artery disease, and so on. Early sickness testing is usually disregarded until the second stage. The process of early disease detection starts with a particular test, and the findings of the unique test, whether positive or negative, decide the following stage [4]. This graph depicts the different kinds of cancer reported by the WORLD HEALTH ORGANIZATION in 2018, together with the ratio of individuals diagnosed with cancer among those who died as a consequence of that, indicating that the second greatest cause of mortality globally is cancer. (Figure 1) [5].

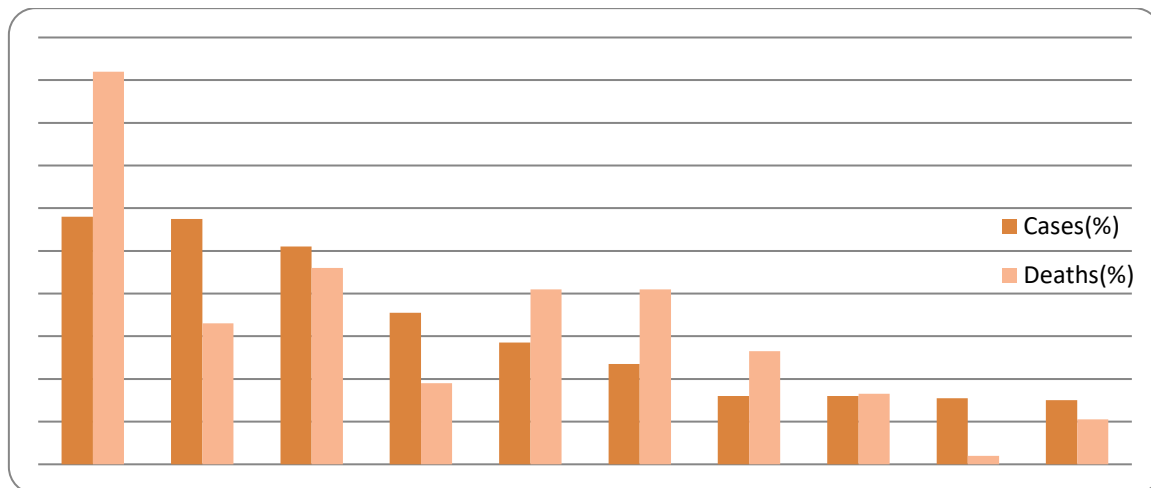


Figure 1: Most common cases of cancer (2018).

1.1 Heart Attack:

Likewise, there are further emergency situations that require prompt treatment or risk becoming life-threatening, like a heart attack, as well known like a myocardial infarction, which causes when the blood circulation to a heart veins is split off due to blockages affected by fat, cholesterol, as well as other substances, leading to the building of plaque, which clots the arteries as well as blocks the blood circulation. Heart attacks and cardiac arrest occur in very different ways. A timely heart attack may result in cardiac arrest if it is not treated or detected, while a heart attack just causes chest pain. In the absence of prompt treatment or diagnosis, a heart attack may result in heart attack [6].

1.1.1 How could we determine that them as heart attack risk factors?

- The following indications of an emergency scenario may be recognized:-
- When you have a tightness, pressure, or discomfort in your chest.
- A kind of discomfort that affects many bodily areas, including the arms, back, neck, and jaw.
- Sensation of tightness or heaviness inside the chest.
- If you suffer from heartburn or acid reflux.
- Nausea or vomiting is a frequent symptom.
- A sticky or sweaty sensation.
- Shortness of breath
- Feeling dizzy is number eight.
- It may be comparable to anxiousness at times.
- sneezing, coughing, or panting

1.2 Cardiovascular illness:

Cardiovascular disease, or CVD, is a group of illnesses (arteries and heart) and the leading cause of mortality worldwide, accounting for 17.9 million fatalities annually. Four of the five categories of CVDs, according to studies thus far, are caused by heart attacks and strokes. Although efforts are being made to reduce the danger of CVD, some individuals are still unaware that they have a high risk of developing that. Researchers have observed so a number of heart attacks could be avoided with attempting to control high danger factors, which in highly dependent on modifying one's way of life to eliminate smoking, harmful drinking and eating, alcohol consumption, high levels of blood sugar, and cholesterol, as well as taking necessary medication [7].

1.3 Inadequateness of Screening Tests:

The purpose of screening is to detect a person with suspected anomalies identified before to the onset of symptoms so that the illness and therapy may be determined. The unfortunate fact of current technology mostly

in medical sector is that there are very few pioneering physicians available to assist people in detecting their ailment so that it may be properly treated as soon as feasible. diagnostic has been done [8].

1.4 Biomarkers:

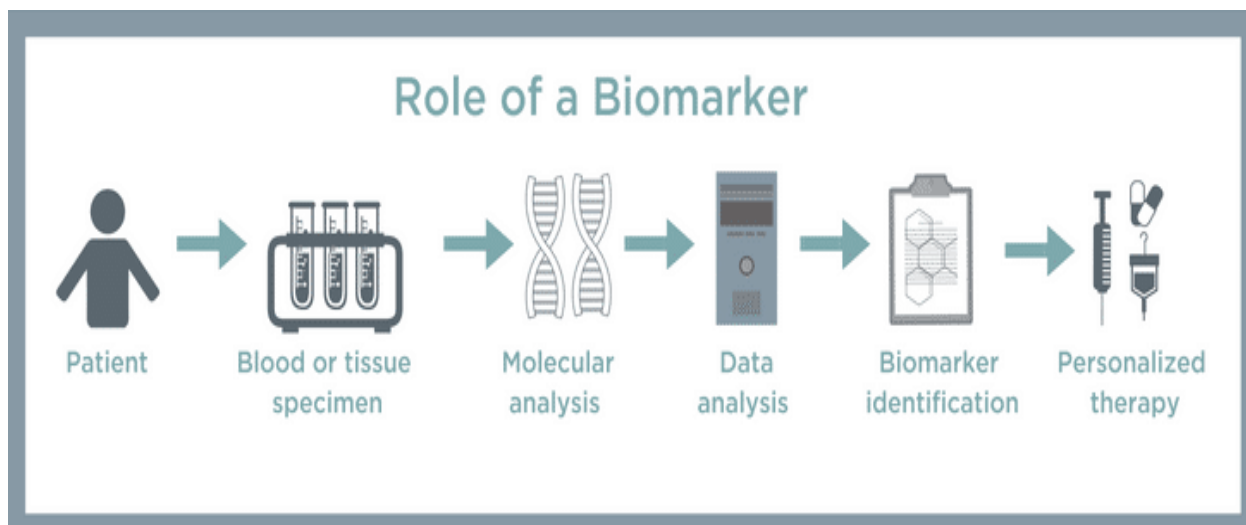


Figure 2: Biomarker's function in medical research and technology.

The word "biomarker," also referred to as a biological marker, refers to a subset of symptoms which might be estimated accurately and precisely depending on the external condition of the patient (figure 2) [9]. Clinical indication prevails over clinical signs, which are limited to the signals of health or illness that patients themselves see. There are a couple more precise theoretical definitions of biomarkers [10]. The graph depicts the likelihood that biomarker clinical studies were effective for detecting and treating illness. (Figure 3).

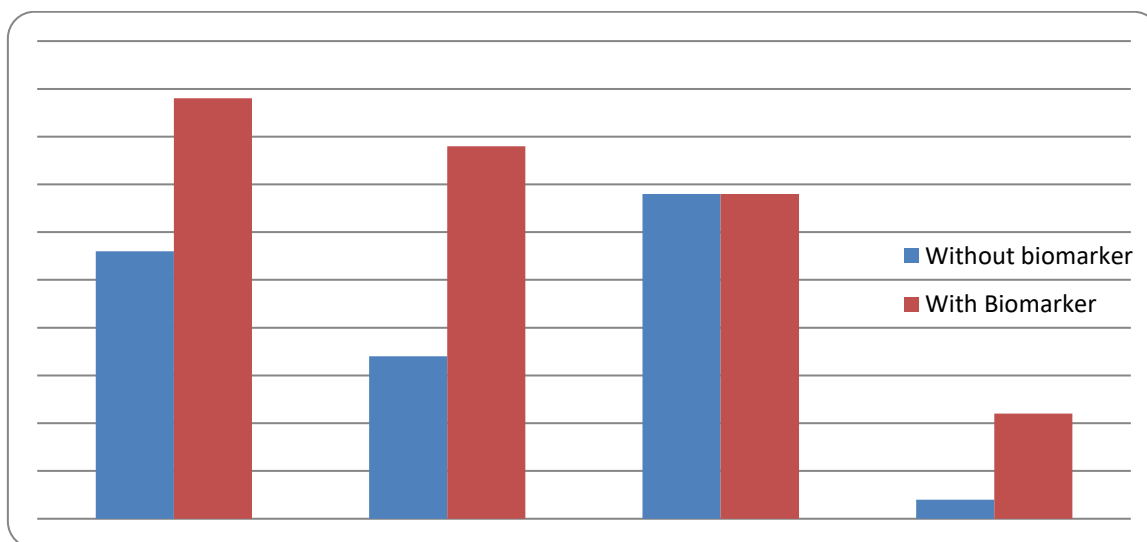


Figure 3: Chance of doing a clinical test.

2. LITERATURE REVIEW

S. Lee, H. Huang, and M. Zelen presented the notion of early detection of disease throughout the studies piece titled "timely diagnosis of disease as well as planning of screening tests," It asserts that the sickness has been identified whenever the individual displays no signs. In addition, they contained a number of specialized cancer diagnostic tests, like the prostate specific antigen test for diagnosing prostate cancer, pap smears for identifying cervical cancer, and mammography for breast cancer detection. Only in some cases of TB, high BP, and

cardiovascular illness, an X-ray is used to identify the ailment. According to a research, 12.5% of people seek medical treatment for their sickness early on, whereas 70% of cancer-related fatalities are the result of late detection. In an article labeled " Which are the indications? of a heart attack in a woman?" published inside the Medical News Today newspaper by J. L. and analysed by Gerhard Whitworth, it was said that males and females experience heart attacks differently. After a heart attack, the chances of survival are less for women. It's similar to a heart attack with unusual symptoms that they've been suffering for weeks, such as chest pain, extreme fatigue, bodily weakness, and so on. In fact, cancer is the second biggest cause of death globally in 2018, accounting for an estimated 9.6 million fatalities. In their online item named "Cancer," WHO provides information on screening, which is essentially done to detect a person with suspected anomalies identified before to the onset of symptoms, and then forwards the information to decide the illness and its treatment.

In a paper titled "What Are Biomarkers? " the authors define biomarkers. K. Strimbu and J. A. Travel explore the term "biomarker," often referred as a biological marker, which refers to a subtype of clinical indicators – that is, a clinical condition detected from the patient's external state – that may be properly and exactly anticipated. Clinical signal trumps clinical symptoms, which are restricted to the indicators of health or sickness that patients individually perceive. R. Mayeux argues throughout his research paper labelled "Biomarkers: Potential Uses and Limitations" that many biomarker studies fail to reach their full potential because they are unable to correlate to the comparable judgement, which also imposes to the use of artificial elements, since no diagnosing device is 100% accurate in all scenarios. Each and every biomarker development should precede or occur concurrently with the normal methods of any epidemiological or clinical first investigation. Throughout the website essay titled "Biomarkers Identify Disease earlier than It's Too Later," the authors explain that in diabetes, biomarkers will signal the beginning stages of the illness prior to the actual glucose level rises, resulting in the standard technique for diagnosing diabetes. That initial diagnosis of diabetes using biomarkers helps people to adjust their lifestyle after seeing a physician in order to treat their disease.

3. DISCUSSION

Physicians, neuroscientists, and epidemiologists have utilized HKU scientists' discovery of "Biomarker" to diagnose human illnesses at an early stage, such as cardiovascular disease, genetic disorders, malignancies, and renal disease. Biomarkers are increasingly being used to assess the severity of illness while also providing information on its etiology and therapy. Biomarkers aid in the identification of prodromal symptoms (an early sign or symptom that signals the onset of illness before any additional symptoms appear). The prodromal phase is often referred to as the first stage of illness. As a result, biomarkers function as a marker that identifies biological features that characterize either a subclinical indication, a problem phase, or a proxy symptom of disease.

This class of biomarkers is anticipated to be used for a variety of purposes, including identifying evidence of people who are susceptible to infection or who are in the "preclinical" stages of disease, lowering illness heterogeneity in biological preliminaries or epidemiologic investigations, obtaining an impression of the basic history of infection, including periods of acceptance, inactivity, and recognition, and focusing for a clinical trial. The advantage in terms of legality and precision considerably surpasses the difficulties of acquiring these tissues from patients. Biomarkers of exposure and sickness are two of the most important types of biomarkers for medical study. Biomarkers of exposure are employed to predict danger, while biomarkers of disease are used to diagnose and monitor the development of disease.

Biomarkers have been shown to be capable of detecting different neurological illnesses at an early stage and providing a method for disease homogeneous categorization. As a result, neuroscientists rely on biomarkers to aid in the detection and treatment of brain diseases and their causes. When diseases like diabetes and cardiovascular disease progress to the point of death, they become incurable. As a result, scientists are always working to create Biomarkers that will allow them to identify illness at an early stage and reverse its effects to return to normal. Also, identify anybody who is at high risk of contracting an illness so that physicians may take precautions to save their lives. This desire of physicians and scientists may be realized since Biomarkers have the capacity to identify illness by transmitting information straight from the bloodstream before any apparent symptoms emerge in the patient. For example, biomarkers in diabetes will signal the early stages of the illness

before it manifests itself in the level of blood glucose, which is a traditional way of detecting diabetes. This early identification of diabetes using biomarkers allows individuals to treat their condition by making lifestyle modifications after consulting with a clinician.

CONCLUSION

In modern medical and biological study, people frequently hear the term "Biomarkers" in the health section of newspapers, both in print and online. Biomarkers are essential for strengthening the medication improvement process and the broader biomedical research endeavour. Knowing the connection between quantifiable chemical cycles and clinical results is crucial for increasing our arsenal of medicines and enhancing our knowledge of healthy, normal physiology. The importance of using biomarkers as a replacement leads in large reductions of fatal diseases, such as CVDs and cancer, as discussed in the article. Many biomarker studies never achieve their full potential as a result of the difficulties of matching factors that are unquestionably unnatural to a similar alternative. No diagnostic tool is 100 percent accurate. Any biomarker development should occur before to or concurrently with the usual design of any epidemiological study or clinical trial.

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