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Clinical Markers: An Insight into their Role in Diagnosis, Treatment, and Prognosis Modern

Tommy Nohilly*

Department of Paediatric Surgery, University of Southampton, UK

INTRODUCTION

In modern medicine, clinical markers play a vital role in diagnosing diseases, predicting outcomes, monitoring therapeutic efficacy, and guiding treatment decisions. These markers, also known as biomarkers, are measurable indicators of a biological state or condition. They provide objective data that clinicians use to make informed decisions in patient care. Biomarkers can be derived from various sources, including blood, tissues, and imaging, and they help in detecting diseases early, predicting their progression, and determining the most effective treatment regimens. In this article, we will explore the concept of clinical markers, their types, their role in various diseases, and how advancements in medical science are improving their utility in clinical practice. A clinical marker is any substance, structure, or process that can be measured in the body and which provides information about health, disease, or the effects of treatments. These markers serve as objective measures that reflect physiological, pathological, or pharmacological responses to a therapeutic intervention. Diagnostic markers help in the detection and identification of diseases [1,2]. They are essential for determining the presence or absence of a condition. For instance, troponins, proteins found in cardiac muscle, are used as diagnostic markers for acute myocardial infarction (heart attack).

DESCRIPTION

Elevated levels of these proteins in the blood indicate heart muscle damage, which helps clinicians make a definitive diagnosis. Prognostic markers are used to assess the likely course or outcome of a disease. They help clinicians estimate the disease's progression and the patient's survival chances. For instance, in cancer, the overexpression of certain genes such as HER2 in breast cancer is a prognostic marker that indicates a more aggressive form of the disease and a higher risk of recurrence. Predictive markers help clinicians determine which patients are likely to benefit from a particular treatment. For example, the presence of mutations in the KRAS gene can predict whether a patient with colorectal cancer will respond to EGFR inhibitors, a type of targeted therapy. These markers measure the effects of a drug on the body and can help adjust dosages to maximize therapeutic effects while minimizing adverse reactions. Blood pressure is a pharmacodynamic marker used to monitor the efficacy of antihypertensive medications [3,4]. Monitoring markers are used to track the progression of a disease or response to treatment over time. For instance, Prostate Specific Antigen (PSA) levels are monitored in men with prostate cancer to evaluate how well the treatment is working or if the cancer has recurred.

CONCLUSION

Risk markers are used to identify individuals who are at increased risk of developing a certain disease. For example, LDL cholesterol is a well-established risk marker for cardiovascular disease. Elevated levels indicate a higher risk of heart attack or stroke. Cardiovascular Diseases (CVD) are among the leading causes of death worldwide. Clinical markers are essential in diagnosing and managing these diseases. Troponins, C-reactive protein, BNP (B-type natriuretic peptide), and cholesterol levels are commonly used markers in the diagnosis and prognosis of cardiovascular conditions. As mentioned earlier, these proteins are highly specific to cardiac muscle damage and are considered the gold standard for diagnosing heart attacks.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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Corresponding author Tommy Nohilly, Department of Paediatric Surgery, University of Southampton, UK, E-mail: tommy_nohilly@gmail.com

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