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Effects of Biomarkers in Certain Cancer Treatment

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INTRODUCTION

Biomarkers have numerous potential applications in oncology, including risk assessment, screening, differential diagnosis, prognosis determination, treatment response prediction, and disease progression monitoring [1]. Because biomarkers play such an important role at all stages of disease, it is critical that they go through rigorous testing, including analytical validation, clinical validation, and clinical utility assessment, before being used in routine clinical care.

DESCRIPTION

In this review, we discuss key steps in the development of biomarkers, such as how to avoid bias and guidelines to follow when reporting biomarker study results. With the tremendous increase in knowledge about cancer biology and the rapid changes in molecular technology over the last decade, studies of cancer biomarkers are published almost daily [2]. Because of this abundance of information, clinicians and scientists must have a thorough understanding of biomarkers and biomarker development in order to critically review the literature and determine whether a biomarker can and should be used for patient care, or whether additional evaluation is required before it can be incorporated into routine medical practice. Biomarkers typically distinguish an affected patient from a healthy person. A variety of factors can cause the changes, including germline or somatic mutations, transcriptional changes, and posttranslational modifications. Biomarkers can include proteins such as an enzyme or receptor, nucleic acids such as microRNA or other noncoding RNA, antibodies, and peptides, among other things [3]. A biomarker can also be a group of changes, such as gene expression, proteomic, and metabolomic signatures. Biomarkers can be detected in the bloodstream, excretions, or secretions and thus easily assessed noninvasively and serially, or they can be tissuederived and require biopsy or special imaging for evaluation. Genetic biomarkers can be inherited and detected as sequence variations in germ line DNA isolated from whole blood, sputum, or buccal cells or somatic and identified as mutations in tumour DNA. Biomarkers can be used for patient assessment in a variety of clinical settings, including estimating disease risk, screening for occult primary cancers, distinguishing benign from malignant findings or one type of malignancy from another, determining prognosis and prediction for cancer patients, and monitoring disease status, either to detect recurrence or determine prognosis. Importantly, some biomarkers are only used in a specific context, whereas others can serve multiple functions. If risk reduction strategies or screening have been shown to be effective, determining a patient's risk of developing a malignancy is beneficial [4]. Applying these strategies to high-risk groups is far more effective than applying them to the entire population.

CONCLUSION

Biomarkers have been discovered that can be used to predict a person's risk of developing cancer. Biomarkers can be used to screen otherwise healthy individuals for cancer. Prostate specific antigen is a commonly used but contentious biomarker for screening (PSA). Following FDA approval in 1986, increased screening of men over the age of 50 resulted in an increase in prostate cancer diagnoses, but there were concerns about overtreatment. The most recent United States Biomarkers can also be used in a patient with an abnormality to differentiate between different possibilities in the differential diagnosis. If a patient's chest CT reveals a lung nodule, histologic examination of the biopsy specimen can determine whether the tissue is cancer, infection, inflammation, or another benign process. If cancer is found, specific immunohistochemical markers can be used to try to identify the tissue of origin.

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CONFLICT OF INTEREST

Authors declare no conflict of interest

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