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Cancer pathology-related modeling and IT-Assisted approaches as the integrated resources for treatment decisions to prevent, to treat and to get cured skin cancer and Its complications: An expert consensus panel

Abstract:

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, personalized and precision medicine (PPM). In this context, Personalized & Precision Oncology (PPO) is an innovative approach to cancer management that ensures your treatment is specifically designed and targeted to your unique form of cancer. The latter are both the science of using each patient's individual genomic landscapes – the genes that are mutated, causing the cancer to grow – to create a biomarker-based targeted therapy protocol.

To achieve the implementation of PPM and PPO concept, it is necessary to create a fundamentally new strategy based upon the recognition of biomarkers long before the disease clinically manifests itself. And personalized tumor molecular profiles (uniting genomic and phenotypic ones), tumor disease site and other patient characteristics are then potentially used for determining optimum individualized (preventive, prophylactic, canonical and rehabilitative) therapy options to be tailored and applied for.

Each decision-maker values the impact of their decision to use PPM/PPO on their own budget and well-being, which may not necessarily be optimal for society as a whole. It would be extremely useful to compile and integrate available scientific knowledge on skin cancer-associated abnormal genes and gene products and their implications for skin cancer therapy, and thus data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients resulting in improved patient outcomes, reduced adverse events, and more cost effective use of the latest health care resources including diagnostic (companion/theranostics ones), preventive and therapeutic (targeted molecular and cellular) etc. This complex and unique process provides a fairly exhaustive resource for dermatologists and oncologists to use as a PPM-driven skin cancer therapy option that is designed to be highly clinically applicable.

PPM/PPO are most likely to play a great role in cancer management and treatment. Pre-early (subclinical) detection and appropriate, risk-adjusted treatment is essential to ensure optimal outcomes for patients diagnosed with skin cancers (such as melanoma and cutaneous squamous cell carcinoma). Once a patient is diagnosed, determining their risk status is particularly important, as it has major implications for treatment selection. Failure to appropriately assess patient risk can lead to either over or under-treatment, negatively impacting patient outcomes. Meanwhile, gene expression profiling (GEP) technologies designed to aid in diagnosis and risk assessment have emerged for melanoma, and many more are in development. Use of these tests can help dermatology clinicians, in early identification of patients with high-risk skin cancers who may require a more aggressive treatment approach.

Risk-stratification of cancer, traditionally performed through staging, directs optimal disease management decisions with the result of improved patient outcomes. So, PPM-driven skin cancer research and practice is an emerging approach that allows predicting responses to treatments or possible adverse events through the discovery and analysis of new predictive and/or prognostic biomarkers, reducing the gap between basic research and clinical management of the patient.

Current investigations using nanomaterial-mediated targeting of melanoma cancers are directed at augmenting drug delivery and immunomodulation of skin cancers to induce a robust anticancer response and minimize toxic effects. For instance, theranostic nanomaterials can modulate immune mechanisms toward protective, preventive, therapeutic, or diagnostic approaches for skin cancers. Those tests and treatments can be easily integrated into clinical practice to help guide treatment choices. Meanwhile, a lack of the medical guidelines has been identified by the majority of responders as the predominant barrier for adoption, indicating a need for the development of best practices and guidelines to support the implementation of PPM/PPO! So, coordination of all health care stakeholders has become more important than ever to unite dermatologists, oncologists, pathologists, and payers to work with Big Pharma and Biotech to develop products, services, and coverage policies that would improve patient outcomes and lower overall health care costs for institutions that put personalized regimens in place. This is the reason for developing global scientific, clinical, social, and educational projects in the area of PPM/PPO to elicit the content of PPM-driven skin oncology as the new branch and to stress the impact and benefits of the latter.

Biography

Dr. Sergey V. Suchkov, MD, PhD, comes from a family of medical professionals in Astrakhan, Russia. He earned his MD in 1980 and his PhD in 1985. Dr. Suchkov held significant positions in clinical immunology and served as Secretary-in-Chief of the Editorial Board for Biomedical Science. Currently, he is a Professor at the Russian University of Medicine and holds memberships in esteemed organizations like the New York Academy of Sciences and the American Heart Association, reflecting his commitment to global medical research.