Recent Advancements in Cancer Treatment

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Commentary

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INTRODUCTION

In the last few years, two important revolutions in cancer treatment have occurred: targeting actionable changes in oncogene-driven tumours and immuno-oncology. In both domains of cancer therapy, significant obstacles remain. On the one hand, druggable genetic changes are diverse and only represent tiny groups of patients in certain tumour types, limiting the ability to examine their clinical impact in biomarker-driven clinical trials. Although next-generation sequencing technologies are increasingly being used in clinical research for molecular pre-screening, problems with clinical interpretation of massive genomic data make their widespread usage problematic. Furthermore, dealing with tumour heterogeneity and acquired resistance is likely the most significant stumbling block to precision oncology's success.

Long-term survival benefits with immune checkpoint inhibitors (antiprogrammed death cell protein-1/Programmed Death cell ligand-1 (PD-1/L1) and anticytotoxic T lymphocyte antigen-4 monoclonal antibodies) are, on the other hand, limited to a small subset of patients, and no robustly validated predictive markers exist to help us identify these subsets and optimize treatment delivery and selection. Drug combinations addressing many molecular abnormalities or cancer hallmarks may be required to produce long-term survival improvements. One of the most difficult but promising precision cancer therapy options in the future will almost certainly be this.

Cancer treatment has had its ups and downs throughout history, not only due to treatment ineffectiveness and side effects, but also due to hope and the reality of complete remission and cure in many cases. Antitumor medicines and radiation, which have been the therapy of choice in some cases, are part of the therapeutic arsenal, alongside surgery in the case of solid tumour. Immunotherapy has grown in importance as a therapeutic option in recent years, and it is now the first choice in many patients.

Nanotechnology is a relatively new therapeutic option, with nanostructures being used for controlled drug delivery, combining imaging and treatment, applying heat, and giving directed target therapy, among other applications. These treatments can be used alone or in combination with other treatments (antibodies, peptides, folic acid, etc.). Furthermore, gene therapy offers new treatment options that are both prospective and promising. We give a

timeline of cancer treatment advances, beginning with chemotherapy, surgery, radiation, and immunotherapy and progressing to the most promising cutting-edge therapies (gene therapy and nanomedicine). We provide a historical perspective on the introduction of these therapies to clinical practice and the market, as well as the benefits and problems they bring.

Chemotherapy has long been the gold standard for cancer treatment. Chemotherapeutic medications are meant to target both quickly dividing cells like cancer cells and normal cells like the intestinal epithelium. A new category of cancer treatment, known as targeted cancer medicines, has risen to prominence in recent years. Traditional chemotherapy and targeted cancer therapies both use pharmacological medications to reduce cancer growth, increase cell death, and prevent it from spreading.

Targeted cancer therapies, rather than using broad-based cancer treatments, may be more therapeutically useful for several cancer types, including lung, colorectal, breast, lymphoma, and leukemia, by focusing on specific genetic alterations that are specific to a given cancer. In addition, recent developments have made it possible to evaluate and personalize therapy to the tumour of a specific patient. Monoclonal antibodies, small molecule inhibitors, and immunotoxins are the three main types of targeted cancer therapy.

Acute and late toxicities caused by oral problems cancer therapy may go unreported, unnoticed, and untreated. Changes in the occurrence, type, and severity of oral problems have resulted from recent advancements in cancer treatment. As the number of survivors grows, it is becoming clear that aggressive oral toxicology care is required to preserve optimal long-term dental health and general well-being. Advances in treatment have had an impact on previously recognized oral problems, as well as new side effects.

Long-term problems have a substantial impact that necessitates increasing knowledge and identification in order to encourage prevention and proper response. As a result, it is critical for the primary oncologist to be aware of these issues so that appropriate precautions can be taken as soon as possible. Multidisciplinary health care teams, which must be integrated and communicate effectively in order to deliver the greatest patient care in a coordinated manner at the appropriate time, are the best option for prevention and management.