

Drug Design in the Context of Cancer Recent Advancements

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EDITORIAL NOTE

Cancer is an increasing explanation for morbidity and mortality in most countries. It's recently overtaken heart condition because the commonest explanation for death within the UK. "Breakthroughs" in cancer research are reported regularly within the media. Some reports are supported new results that show potential for improved treatments, but others are premature or publicity seeking, and therefore the motivation behind them is questionable. The general public has high expectations that basic science cancer research will translate into improved cancer cures and care. Yet awareness and understanding of the clinical trials that are essential in establishing the effectiveness of latest treatments is restricted. Recruitment to randomized clinical trials evaluating new cancer treatments is usually slow, partly because people are convinced that each one new treatments are likely to be an improvement and partly due to unease about the method of randomization. Better public education about categories of evidence in reference to health interventions might contribute to speedier and more appropriate evaluation of promising treatments.

Public confidence that cancer care within the UK is perfect has been shaken by reports that outcomes for a few common cancers differ in countries in western Europe, which survival rates in Britain for 18 of 25 cancer types studied are poorer than in most other European countries. Better than average outcomes were seen in Switzerland, Finland, and Holland. These reports, alongside evidence that cancer survival rates differ within a rustic consistent with the pattern of care, prompted review of the supply of look after cancer patients within the UK and in parts of Australia. Optimal organization of cancer care might achieve appreciable gains. Within the case of carcinoma, this might amount to a 5% improvement within the survival rate at five years. Such a gain would be viewed as a serious breakthrough if it were the results of a replacement treatment.

Recent advances

- Multidisciplinary treatment teams specializing in specific organ sites are recognized as being important for optimal cancer care and for improving outcome.

- The organization and delivery of supportive care to patients with cancer has improved.
- Treatment goals are more clearly defined.
- Public awareness and understanding of the clinical trials that are driving clinical research has increased.
- Research has started on potential treatments like matrix metalloproteinase inhibitors, gene therapy, and cancer vaccines.

Clinical trials

The need to gauge efficiently and appropriately promising cancer treatments and variations in approaches to treatment provides further impetus to a reorganization of cancer care services. Better organized cancer treatment services allow more rapid evaluation of experimental treatments and supply a crucial opportunity for doctors and patients to gauge new treatments and treatment strategies. Pharmaceutical and other companies are now major sources of funding for medical research, but the research priorities of the industry are driven by the market and aren't always an equivalent as those of the doctors, the patients, or the community that ultimately pays. The pharmaceutical industry has come to dominate the clinical trials programmes altogether developed countries where charges for brand spanking new drugs restrict research initiated by clinicians. Nevertheless, the interests of patients and therefore the community are best served by identifying quickly the effective treatments, discarding treatments which aren't effective, and determining the foremost efficient use of resources.

New treatments

Improved understanding of the biology of cancer will ultimately mean that the present, empirically derived cytotoxic drugs and radiotherapy are going to be superseded by cancer treatments supported specific genetic and phenotypic abnormalities in cancer cells. Though this goal remains a dream, advances in cancer biology are identifying targets for brand spanking new treatments, and a few of those will convince be the Achilles' heel of cancer cells. Within the meantime, new cancer treatments currently being tested in clinical trials are discussed below.

Matrix metalloproteinase inhibitors

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Matrix metallo-proteinases are a family of proteases involved within the invasion of the basement membrane, and hence the method of invasion and metastasis. Several inhibitors of those enzymes are now being evaluated in patients with advanced cancers including gastric, pancreatic, and ovarian cancer. If these drugs are found to be effective, they may, like established hormonal treatments like tamoxifen, have a task as adjuvant therapy in patients at high risk of disseminated disease.

Gene therapy

Inherited or acquired genetic changes are implicated within the behavior of malignant cells that arise in both familial and sporadic cancer. Gene therapy aims to take advantage of differences between malignant and normal cells. There are now over 100 trials of gene therapy in humans' most involving treatment of cancer. Selective targeting at deposits of tumor cells may be a problem yet to be solved.

Immunotherapy

Immune recognition of cancer cells has long been the hope of tumor immunology. The potential of vaccines to guard people from cancers caused by viruses remains a dream, though expectations are high for hepatitis and cervical cancer. The long held notion that treated cancer cells could be used as a vaccine has recently resurfaced. New techniques modify tumor cells in order that molecules enhancing immune recognition and responsiveness are expressed. These approaches will need to be evaluated critically before the expectations of tumor immunology enhance cancer control and treatment.

Our ageing population and progress within the prevention and treatment of heart and cerebrovascular disease increase the importance of cancer as an explanation for morbidity and mortality. Changes within the way cancer care is organized have the potential not only to enhance the result of treatment but also to streamline the acceptable evaluation of breakthroughs in cancer treatment that are anticipated from the rapidly advancing knowledge of cancer biology.