Stratified cancer care: steps towards the goal

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C Barrie
Specialty Registrar Medical Oncology, Western General Hospital, Edinburgh, UK

Correspondence to C Barrie
10 Mauchline Grove,
Kirkcaldy, Fife KY2 6AS
Scotland

e-mail
Colin.Barrie@nhslothian.scot.nhs.uk

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INTRODUCTION

The number of treatment options available to cancer patients is ever-increasing, in parallel with our growing understanding of disease heterogeneity. Sophisticated diagnostics have led to a greater number of targeted therapies facilitating tailored cancer treatment.

SESSION ONE – INDIVIDUALISED CANCER THERAPY: WHERE ARE WE NOW?

Delivery of precision medicine in early phase clinical trials (particularly with regards to intra-patient heterogeneity and genomic complexity) was discussed by Professor Johann De Bono (Professor of Experimental Cancer Medicine, Institute of Cancer Research and Royal Marsden Hospital, London). This was demonstrated by his work in metastatic castration-resistant prostate cancer and the increase in overall survival with the use of abiraterone.[1] Professor Anthony Chalmers (Professor of Clinical Oncology, Beatson Institute for Cancer Research and Beatson West of Scotland Cancer Centre) explored individualised radiotherapy treatment. Patient selection, optimisation of dose and manipulation of tumour environment are key. The RAPPER GWAS study by Barnett et al.[2] has shown common genetic variations that influence risk of radiotherapy toxicity and helps predict those who should not receive this treatment.

The use of genotyping and its role in pharmacogenetics was explored by Professor Alan Boddy, Professor of Cancer Pharmacology, Newcastle University. Personalisation of chemotherapy must take into account genetic differences in the metabolism of agents, in order to minimise both short and longer term toxicities.[6] Mercaptopurine and irinotecan, both of which have varying degrees of toxicity depending on genotype, are examples.

SESSION TWO – STRATIFIED CANCER THERAPY: WHO PAYS?

Professor Jim Cassidy (Head of Translational Medicine at Roche Pharmaceuticals) gave an enlightening overview of the challenges faced by the pharmaceutical industry, including drug patents and the rise in the number of generic medicines. Attrition rates have been high and a potential way forward is to increase the number of biologics being developed; there are 42% of pipeline products compared to 8% of current marketed and approved products. The concept of heterogeneity arose again with the idea of a stable genotype with varying phenotypes. This led to the idea of multiplex assays in future at time of diagnosis, which may ultimately lead to a system of payment based on performance.

The Sydney Watson Smith lecture was delivered by Professor Sir Mike Richards, National Clinical Director for Cancer and End of Life Care. He gave an overview of the current situation in England and discussed individualising care at each stage, such as prevention (BRCA patients) and screening. Good assessment and care planning throughout the survivorship period offers an opportunity to make the patient's recovery and journey as personalised as possible. At the opposite end of the spectrum, end-of-life care also provides opportunities for individualisation; introduction of care planning and systems such as electronic palliative care systems have helped more people die in their chosen place of care.

SESSION THREE – MANAGEMENT OF THE ACUTELY ILL CANCER PATIENT

There is nothing more individual than a patient's symptoms; we were reminded of this by Dr Marianne Nicolson (Consultant Medical Oncologist, Aberdeen Royal Infirmary) in her review of breathlessness. The complex aetiology and its impact were demonstrated: 70% of cancer patients are breathless at some point and in particular in the last six weeks of life.[3] In addition to our standard treatments for breathless patients, a recent article has shown that non-invasive ventilation is more effective than oxygen for symptomatic benefit (endpoints of dyspnoea and opiate use).[4] Understanding both the physical and psychological causes for each patient allows an individualised treatment plan to be implemented.

With an increasing number of patients surviving for longer periods and consequently more undergoing increasingly complex treatments, we need to develop an acute oncology service nationally. Dr David Dunlop (Clinical Director, Beatson West of Scotland Cancer Centre) demonstrated the current model and pressure caused by increasing patient numbers over wide geographical regions. Out-of-hours provision is contentious and ways of improving this are currently being investigated.

SESSION FOUR – STATE OF THE ART CANCER IMAGING

Diagnosis and monitoring of disease requires imaging modality capable of detecting the biological hallmarks of cancer. Professor deSouza (Professor of Translational Imaging, Institute of Cancer Research, Sutton) demonstrated the current modalities of functional imaging used in routine practice and highlighted newer techniques on the horizon. Standardisation of data acquisition and analysis, along with reproducibility were shown to be paramount in response assessment.

Professor Margaret Frame (Director, University of Edinburgh Cancer Research Centre) demonstrated the use of imaging at the opposite end of the spectrum and its benefit in visualising cell lines and their response to novel targeted therapies.

TAKE-HOME MESSAGE

This is an exciting time in oncology with many developments in our understanding of cancer biology and targeted therapies. As a community we have already begun the process of tailoring individual patients' treatment to their particular cancer type, and hopefully this will translate to an increase in the overall survival rate. However this type of care is expensive and we are in a system already struggling to cope with the financial costs of targeted therapies and patient numbers. The question remains: how can we fund the therapies and improved infrastructure required to effectively deliver personalised care?

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