Personalised Medicine
All-Party Parliamentary Group

More personalised medicine for lung cancer: benefits and barriers

EVENT BRIEFING – FEBRUARY 2017

This document was produced for a roundtable event with patient representatives and clinical experts.

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How is personalised medicine benefiting lung cancer patients?

Lung cancer is the second most common cancer in the UK, after breast cancer, with 46,403 cases diagnosed and 35,898 deaths (2014, UK). While developments in diagnosis and treatment have improved the five- and ten-year survival rates of many cancers, unfortunately this is not the case for lung cancer, where survival has stayed relatively static for the last 40 years. One reason is that late diagnosis is a problem: around 75% of patients are diagnosed with stage III or IV cancer – that is, advanced or metastatic disease, which is much more challenging to treat. Only 10-15% of patients are diagnosed early enough to have potentially curative surgery.

In addition, patients often have other conditions – comorbidities – that affect treatment; these could be lung disease, heart disease or other conditions such as diabetes. As such, 40% of patients diagnosed with lung cancer are given best supportive care only since treatment is likely to cause more harm than good. Personalised medicine approaches involving innovative technologies have the potential to improve diagnosis and management of this challenging disease.

Personalised medicine in lung cancer – areas for action

New drugs developed in the last decade include biological therapies, which treat non-small cell lung cancer (NSCLC) tumours that have specific genetic mutations. Tumour genetic testing is needed to prescribe these drugs accurately. This stratified medicine approach is being explored in the National Lung Matrix Trial, where eligible NSCLC patients are placed into treatment groups according to the genetic mutations found in their tumours. The goal is to understand how well the different treatments work, and to understand more about how tumours develop resistance to drugs. Other up-and-coming therapies include immunotherapy, which harness the power of the immune system against cancer.

Breath Biopsy® for earlier diagnosis

Tools for earlier diagnosis can help to stratify patients into those who need further clinical investigation and those who do not, improving the chances of earlier diagnosis and the possibility of curative surgery. Owlstone Medical's ReCIVA breath sampler is designed to collect compounds in the breath that indicate the presence of disease, which are analysed by the company's FAIMS sensor. An ongoing clinical trial is investigating whether this approach is more effective than current screening tests such as CT scans.

Circulating tumour DNA testing to target treatments

Circulating tumour DNA (ctDNA) testing analyses cancer DNA that is found circulating in the blood and is an alternative to genetic testing of a solid tumour sample. In lung cancer, ctDNA liquid biopsy is a viable alternative to solid tumour biopsy since collecting a tumour sample is a challenging and sometimes risky medical procedure. Some NHS laboratories are offering ctDNA testing to NSCLC patients, to help clinicians prescribe biological therapies and to detect genetic resistance to these therapies. Patients with a resistance mutation can be prescribed a second-line therapy.