MedicalXpress

# New study could help tailor treatment for most common type of leukaemia

December 19 2017

New findings by scientists at the University of Southampton could help to predict how people with the most common form of leukaemia will respond to chemotherapy. The findings will help doctors decide which type of treatment to give patients.

The researchers, who were funded by the blood cancer research charity Bloodwise, analysed DNA samples from over 600 people with chronic lymphocytic leukaemia (CLL) treated on clinical trials with chemotherapy, or chemotherapy combined with immunotherapy. They identified a genetic signature found in one in five patients, linked to considerably longer survival times.

CLL is a slowly developing blood cancer, diagnosed in around 4,000 people each year in the UK. While it is not considered curable, patients who have no sign of cancer left after initial treatment are known to be more likely to have long periods of remission.

Treatment for CLL depends on how fast the disease develops. CLL develops quickly in some people, who need treatment soon after diagnosis, while others may never need treatment because they have no symptoms. Initial treatment usually consists of chemotherapy along with drugs called monoclonal antibodies. New targeted treatments have become available for patients who do not respond to this initial chemotherapy.

Although new targeted drugs, such as ibrutinib—which was approved for

use on the NHS in 2017, have represented a step forward in the treatment of CLL, they are very expensive and not all patients respond to them. The drugs are taken daily for an extended period of time and patients can experience side effects.

The scientists used screening techniques to analyse the 'epigenetics' – biological mechanisms that can influence how and when genes are switched on and off – of CLL patients' cancer cell samples. They showed that patients' cancer cells fell into one of three epigenetic sub-groups. Two in 10 patients had a 'memory' epigenetic signature, in which one-off chemotherapy can lead to long survival times, five in 10 had a 'naïve' epigenetic signature that did not respond as well to treatment, and three in 10 belonged to an intermediate group.

On average patients treated with chemotherapy whose cancer cells contained the 'memory' epigenetic signature survived for nearly nine years compared to five years for patients with the 'naïve' epigenetic signature.

Findings from this study have proven the link between epigenetics and survival in people with CLL who are receiving chemotherapy-based treatments. Testing the epigenetic profile of CLL patients before they start treatment could help to identify those who gain long-lasting remission with conventional chemotherapy-based regimes, and pinpoint those who may need alternative treatments.

Epigenetic changes—changes to how the DNA 'script' is read—occur in all cancers. These latest findings provide further evidence that epigenetic tests can improve diagnosis and guide doctors on the most suitable treatments for individual patients.

The results from the study were announced at the Annual Meeting of the American Society of Hematology in Atlanta on Saturday 9 December.

Professor Jonathan Strefford, from the University of Southampton, said: "What we have found is that it is possible to identify patients who will respond extremely well to a one-off course of traditional chemotherapy, which can result in long-term remission and in some cases can be the equivalent to a cure."

"While new targeted drugs have led to significant improvements in treatment for CLL in patients who relapse after chemotherapy, many patients don't want to be taking treatment every day, often with an impact on their quality of life.

Dr. Alasdair Rankin, Director of Research at Bloodwise, said: "There are an increasing number of effective treatments becoming available for people with chronic lymphocytic leukaemia. The key is to accurately tailor the right treatments to the right patients, as not everyone will respond in the same way. This valuable study shows that a fairly significant number of people with CLL can still benefit considerably from treatment with conventional chemotherapy."

CLL is diagnosed in over 4,000 people each year in the UK and is the most common type of adult leukaemia. Patients produce immature versions of white blood cells called lymphocytes, which build up in the bone marrow and crowd out healthy blood cells.

CLL develops slowly and primarily affects patients' immune systems and their ability to fight off infections. Symptoms can include fatigue, swollen lymph nodes, frequent infections, weight loss and night sweats.

Many patients will not start treatment straight away, but will be put on a programme call 'watch and wait' until the cancer develops further. Some patients will never need treatment. For those patients who do undergo treatment, this usually initially consists of a combination of chemotherapy drugs and monoclonal antibody drugs—artificial

antibodies that bind to and kill specific cancer cells.

**More information:** Clinical Importance of DNA Methylation Signatures in Chronic Lymphocytic Leukaemia Patients Treated with Chemo-Immunotherapy, presented at the Annual Meeting of the American Society of Hematology in Atlanta at Saturday 9 December 2017

Provided by University of Southampton