

Striking differences seen in COVID-19 responses in cancer patients



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A new study funded by Cancer Research UK shows that the immune response to COVID-19 is the same in people with solid tumours compared to those without cancer.

However, blood cancer patients varied in their ability to respond to the virus, with many unable to shake off the virus for up to 90 days after the first signs of infection – around 5 times longer than the average.

Due to the importance of sharing findings related to the pandemic, the publication has been fast-tracked online as a preprint* in Cancer Cell today** (Tuesday). The study gives reassurance to many people with cancer, but also highlight that patients cannot be grouped together when it comes to delivering cancer care during the pandemic.

The COVID-19 pandemic has led to many challenges for people with cancer, including decisions around shielding and delaying treatment. There is also conflicting evidence around COVID-19 having a more detrimental effect on those with cancer, and there is little insight into how cancer patients' immune systems respond to the virus.

Researchers led by Dr Sheeba Irshad, a Cancer Research UK clinician scientist based at King's College London, in collaboration with Professor Adrian Hayday and Dr Piers Patten (Consultant Haematologist) wanted to address two key questions: 1) Does the immune response to COVID-19 in cancer patients differ to those without cancer; and 2) What is the long-term impact of COVID-19 on the immune system in people with cancer.

The study analysed the blood of 76 cancer patients: 41 of

them had COVID-19, and 35 had not been exposed to the virus***. The samples were compared to the blood of people who didn't have cancer, and who had already been recruited to the previously published COVID-IP study led by Professor Adrian Hayday****. Of the 41 people with cancer, 23 had solid tumours, and 18 had blood cancer.

Immune responses to the virus in people with solid tumours were like those of people without cancer. This was the case even where patients were in the advanced stages of cancer and were undergoing active anti-cancer treatments. Both groups were able to mount a strong immune response to the initial COVID-19 infection, and subsequently developed high levels of antibodies to clear the virus from their systems.

This study was the first to show that high levels of COVID-19 antibodies are sustained long-term in patients with solid tumours — up to 78 days after exposure to the virus. The study also found that once patients had recovered from COVID-19, their immune systems returned to 'normal', pre-COVID functioning.

The immune response to COVID-19 in people with certain types of blood cancer was similar but “milder” in the active/early phases of the disease and became stronger over time resembling immune changes often seen in chronic infections. This was especially true for cancers affecting B cells: a type of immune cell that plays an important role in immune memory.

In patients with B cell-related blood cancers, the antibody response to the virus was more diverse compared to people with solid tumours and presented as three distinct groups: 1) those who developed antibodies and cleared the virus like the solid cancer patients and people without cancer; 2) those who never developed antibodies even >75 days after virus exposure and continued to fail to clear the virus; and finally, 3) those who despite having developed antibodies against the virus were unable to clear it.

The next phase of the SOAP study will be monitoring the immune responses of cancer patients to the COVID-19

vaccine.

Dr Sheeba Irshad, a Cancer Research UK clinician scientist based at King's College London, said: "Whilst we need to maintain caution, our study provides some confidence and reassurance to care providers that many of our patients with solid cancers will mount a good immune response against the virus, develop antibodies that last and hopefully resume their cancer treatment as soon as possible.

"These conclusions imply that many patients despite being on immunosuppressive therapies will respond satisfactorily to COVID-19 vaccines. For patients with blood cancers, especially those with B-cell malignancies, this may not hold true even in the era of COVID-19 vaccines. Our work suggests that they may be susceptible to persistent infection despite developing antibodies, so the next stage of our study will focus on monitoring their response to the vaccines. At present the best way to protect them may be to vaccinate all the carers to achieve herd immunity in the clinic."

Martin Ledwick, head information nurse at Cancer Research UK, said: "People with cancer and their families might feel especially worried about the virus, as certain types of cancer and its treatment can lower the ability to fight infection. This study starts to give some reassurance for those with solid tumours but backs the evidence that people with blood cancers may be more vulnerable. Anyone undergoing cancer treatment should continue to follow the advice of their doctors during the pandemic to protect themselves from catching the virus."

Michelle Mitchell, chief executive at Cancer Research UK, said: "COVID-19 has been at the centre of all our lives this year, but we remain focused on people affected by cancer, and on supporting them through this pandemic. I'm extremely proud of how quickly our researchers have worked to bring them answers.

"Cancer isn't just one disease and understanding how the virus interacts with different cancer types is crucial to ensure every patient gets the best possible care. Thanks to this new

study, we know that we need to approach blood cancer treatment with extra care and doctors can think of ways to help give them the extra protection they might need.”

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