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Covid-19 Specific Memory T Cells

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Why in News

Recent studies have shown that people unexposed to and not infected with **Covid-19** (caused by **SARS-CoV-2** or **Novel Coronavirus**) may still exhibit **T cell responses** specific to other **coronaviruses**.

Key Points

- A huge number of adults are exposed to **four different coronaviruses** that cause **common cold** and studies have shown that **20-50%** of healthy people **display SARS-CoV-2-specific memory T cells**.
 - The healthy people studied were those **tested prior to the pandemic** or have not been infected with novel coronavirus.
 - Memory T cells protect against **previously encountered pathogens**.
- It is thought that **SARS-CoV-2-specific T cell responses** seen in healthy people might arise from **memory T cells** derived from **exposure to ‘common cold’ coronaviruses**.
- However, it is **not known** that the presence of pre-existing immunity from memory T cells **offers clinical relevance**, when exposed to SARS-CoV-2.
- **Measuring pre-existing immunity and correlating** it with infection and severity of disease is the only way to find out its role in protection against SARS-CoV-2.
- However, the **relationship between the infections by and immunity** from common cold coronavirus and **age is not well established**. That is why it is unclear why children do not show severe symptoms, while older people do.
- These considerations underline how **multiple variables may be involved** in potential pre-existing partial immunity to Covid-19.

- **Pros:**

It is believed that people with a high level of pre-existing memory T cells **could mount a faster and stronger immune response** upon exposure to the virus and thereby limit disease severity.

T cells could potentially **facilitate an increased and more rapid neutralizing antibody response** against the virus.

- **Cons:**

- The pre-existing immunity can **reduce the immune responses** that the vaccine causes through a mechanism called the '**original antigenic sin**'.

Original antigenic sin, also known as the **Hoskins effect**, refers to the propensity of the body's immune system to preferentially utilize immunological memory based on a previous infection when a second slightly different version of that foreign entity is encountered.

- It can also lead to **antibody-mediated disease enhancement**, where antibodies present at sub-neutralising concentrations can actually **augment virus infection and cause more severe disease**.

T Cells

- T cells are so called because they are **predominantly produced in the thymus**.
- They recognise foreign particles (antigen) by a surface expressed, highly variable, T cell receptor (TCR).
- There are two major types of T cells: **the helper T cell** and the **cytotoxic T cell**.
- As the names suggest, helper T cells 'help' other cells of the immune system, whilst cytotoxic T cells kill virally infected cells and tumours.
- The severity of disease can depend on the strength of these T cell responses.

Source: TH