Antibodies against coronavirus start to decrease in 2-3 months, study finds

Context

- A few countries, including the U.K., were toying with the idea of issuing some form of a certificate to people who have been infected with novel coronavirus and recovered subsequently, as such people were assumed to be resistant to reinfection.

Study reveals

- Now, a study published in *Nature Medicine* suggests that antibodies formed against SARS-CoV-2 begin to decrease in number, just two-three months after infection.
- “We observed that IgG levels and neutralizing antibodies in a high proportion of individuals who recovered from SARS-CoV-2 infection start to decrease within two-three months after infection,” Quan-Xin Long from Chongqing Medical University, Chongqing, China and others write.
- In contrast, circulating antibodies against 2002-2003 SARS and MERS coronavirus were found to last more than one year.
- In the case of the 2002 SARS, sustained IgG levels were seen for more than two years after infection, while antibody response lasted for nearly three years in the case of MERS.

Is re-infection possible?

- This does not necessarily mean that people previously infected with SARS-CoV-2 can be reinfected soon after.
- Even if the antibody level decreases, it might be protective.
- A person with low antibody level can get reinfected but the viral load will be low, infectivity will be less and he/she may not progress to a diseased state.
- Antibodies specific to a virus even when present in low levels will be protective against disease.
- Besides inducing neutralising antibodies, novel coronavirus has also been found to induce cellular immunity.
- As a result, the immune system’s T cells and B cells are elevated in an infected person.
  “Generally, when antibody levels are high, the T cells are low and vice versa,” says Dr. John.
- When infected by a virus, non-specific immune response in the form of macrophages, neutrophils and other cells tend to prevent the virus from causing symptoms.
- Soon after, the body makes antibodies specific to the virus called the immunoglobulins — IgG and IgM, called the adaptive response.
- In addition, the cellular immunity kicks in when the body makes T cells that destroy cells that have been infected by the virus.
- The combination of adaptive response and cellular immunity “may prevent progression to severe illness or re-infection by the same virus. This process is often measured by the presence of antibodies in blood,” WHO says.
- They found that asymptomatic people were eliciting a weaker immune response to the virus compared with those who developed symptoms.
- As a result, 40% of asymptomatic individuals had antibody levels at undetectable levels compared with nearly 13% in the case of symptomatic individuals.
- Nearly 80% of people infected with SARS-CoV-2 show no or very mild symptoms.
Implications

- The **reduction in IgG and neutralizing antibody levels** in the early convalescent phase might have implications for immunity strategy and serological surveys.
- These data might indicate the **risks of using COVID-19 ‘immunity passports’** and support the prolongation of public health interventions, including social distancing, hygiene, isolation of high-risk groups and widespread testing.
- Besides T cells, people infected with coronavirus also **make memory B cells**, which rapidly **produce antibodies** when required.
- If they find the virus again, they remember and start to make antibodies very, very quickly.
- Another paper published in Nature found that even when the antibodies were present at low levels, it was sufficient to neutralise the virus.
- The authors say that “most convalescent plasmas obtained from individuals who recover from COVID-19 do not contain high levels of neutralizing activity” yet antibodies with **‘potent antiviral activity’** were found in all these individuals.