

Study suggests severe obesity blunts antibody response to COVID-19 vaccines

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New research being presented at this year's European Congress on Obesity (ECO) in Maastricht, Netherlands (4-7 May), suggests that adults (aged 18 or older) with severe obesity generate a significantly weaker immune response to COVID-19 vaccination compared to those with normal weight. The study is by Professor Volkan Demirhan Yumuk from Istanbul University in Turkey and colleagues.

The study also found that people with [severe obesity](#) (BMI of more than 40kg/m^2) vaccinated with Pfizer/BioNTech BNT162b2 mRNA vaccine generated significantly more [antibodies](#) than those vaccinated with CoronaVac (inactivated SARS-CoV-2) vaccine, suggesting that the Pfizer/BioNTech vaccine might be a better choice for this vulnerable population.

Obesity is a disease complicating the course of COVID-19, and SARS-CoV-2 vaccine antibody response in adults with obesity may be compromised. Vaccines against influenza, hepatitis B and rabies, have shown reduced responses in people with obesity.

To find out more, researchers investigated antibody responses following Pfizer/BioNTech and CoronaVac vaccination in 124 adults (average age 42-63 years) with severe obesity who visited the Obesity Center at Istanbul University-Cerrahpasa, Cerrahpaşa Medical Faculty Hospitals, between August and November 2021. They also recruited a [control group](#) of 166 normal weight adults (BMI less than 25kg/m^2 , average age 39-47 years) who were visiting the Cerrahpasa Hospitals Vaccination Unit.

Researchers measured [antibody levels](#) in [blood samples](#) taken from patients and normal weight controls who had received two doses of either the Pfizer/BioNTech or CoronaVac vaccine and had their second dose four weeks earlier. The participants were classified by infection history as either previously having COVID-19 or not (confirmed by their antibody profile).

Overall, 130 participants received two doses of Pfizer/BioNTech and 160 participants two doses of CoronaVac, of whom 70 had previous SARS-CoV-2 infection.

In those without previous SARS-CoV-2 infection and vaccinated with Pfizer/BioNTech, patients with severe obesity had antibody levels more

than three times lower than normal weight controls (average 5,823 vs 19,371 AU/ml).

Similarly, in participants with no prior SARS-CoV-2 infection and vaccinated with CoronaVac, patients with severe obesity had antibody levels 27 times lower than normal weight controls (average 178 vs 4,894 AU/ml).

However, in those with previous SARS-CoV-2 infection, antibody levels in patients with severe obesity and vaccinated with Pfizer/BioNTech or CoronaVac were not significantly different from [normal weight](#) controls (average 39,043 vs 14,115 AU/ml and 3,221 vs 7,060 AU/ml, respectively).

Interestingly, the analyses found that in patients with severe obesity, with and without prior SARS-CoV-2 infection, antibody levels in those vaccinated with Pfizer/BioNTech were significantly higher than those vaccinated with CoronaVac.

"These results provide new information on the antibody response to SARS-CoV-2 vaccines in people with severe obesity and reinforce the importance of prioritizing and increasing vaccine uptake in this vulnerable group", says Professor Yumuk. "Our study confirms that immune memory induced by prior infection alters the way in which people respond to vaccination and indicates that two doses of Pfizer/BioNTech vaccine may generate significantly more antibodies than CoronaVac in people with severe [obesity](#), regardless of infection history. However, further research is needed to determine whether these higher antibody levels provide greater protection against COVID-19."

Provided by European Association for the Study of Obesity

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