

BANGLADESH HEALTH WATCH

Date: 05 July 2021

To
The Director General of Health Services
Ministry of Health & Family Welfare
Government of the People's Republic of Bangladesh

Dear Sir,

Subject: The efficacy of the first dose-second dose match and mix of Covid-19 vaccines

We are appreciative of the frantic efforts that you and your esteemed office undertake to serve the people of Bangladesh efficiently and effectively. Below we provide you some reference materials for deciding on the match and mix of Covid-19 vaccines from different sources.

European countries, including France and Germany, have recently recommended Pfizer's vaccine as a second dose for those who got AstraZeneca's vaccine as their first.¹ This was prompted after many young people showed oozing of blood from their capillaries after the first AstraZeneca vaccine. Kindly note that this is besides the clotting in the bigger blood vessels noted earlier. Kindly note that this does not, however, mean the same would or might happen among Bangladeshis as well. Epidemiological profile of a country and individual human response to a vaccine, which are determined by the race and genetic makeup of individuals, are factors that may cause different reactions to the vaccine. We are also pleased to flag that recently the German Chancellor Mrs. Angela Merkel took the Moderna vaccine as the second dose to AstraZeneca as the first. Below, we cite some other studies which encourage match mix of vaccines, as these have been found to offer better efficacy.

The Spanish study

Spanish researchers recently concluded that a much higher antibody response is obtained from a match and mix of AstraZeneca and Pfizer BioNTech vaccines as the first and the second dose respectively than two doses of AstraZeneca. Antibody levels were about 40 times higher for those who got Pfizer's vaccine two weeks after AstraZeneca's than participants who got a single

¹ Dr. Catherine Schuster-Bruce. A mix-and-match vaccine study suggests one shot of AstraZeneca followed by one shot of Pfizer is effective. May 19, 2021. <https://www.businessinsider.com/one-shot-covid-vaccine-mix-match-astrazeneca-pfizer-side-effects-2021-5>.

AstraZeneca dose. Neutralizing antibodies were boosted more than seven times higher after the dose of Pfizer's shot. In April, the Carlos III Health Institute in Madrid and the Vall d'Hebron University Hospital in Barcelona, Spain trialed a single dose of AstraZeneca vaccine in a study called the CombivacS study and a dose of Pfizer-BioNTech after at least eight weeks of the AstraZeneca shot. Two-thirds of participants were randomly picked to receive the mRNA-based vaccine made by Pfizer BioNTech, based in New York City, and BioNTech, in Mainz, Germany, at least eight weeks after their first dose. After the second Pfizer–BioNTech booster dose, participants began to produce much higher antibody levels than before, and these antibodies were able to recognize and inactivate SARS-CoV-2. Control participants who did not receive a booster vaccination experienced no change in antibody levels.

The German studies

A German study showed that an AstraZeneca's and Pfizer/BioNTech COVID-19 vaccine combination is immunologically superior to two doses of AstraZeneca.² The mixing produces a significantly higher amount of anti-spike antibody and more neutralizing activity against B.1.1.7 (alpha) variant, B.1.351 (beta) variant, and P.1 (gamma) variant. Having the Pfizer/BioNTech vaccine as the second dose significantly increased anti-Spike protein IgG antibody levels compared to increase observed in people who received both AstraZeneca vaccines. Anti-Spike protein IgA antibody levels were also observed to increase. While two doses of AstraZeneca showed some immune response towards the B.1.17 variant, it was ineffective against P.1 or B.1.351 variants. The mixed-match doses were better than AstraZeneca but less efficient against the P.1 and B.1.351 variants.

Viral spike protein-specific host B lymphocytes cells increased remarkably in vaccinated people. IgD antibody isotype was also observed in people who received Pfizer/BioNTech as a second dose. There was a more significant increase in Spike protein-specific CD4 T lymphocytes and Spike protein-specific gamma interferon (IFN- γ) release in the mixed-matched group.

COVID-19 Contacts (CoCo) of the Hannover Medical School's health care professionals were monitored by researchers for AstraZeneca primed immune responses before and three weeks after booster (second dose) with AstraZeneca or BioNTech/Pfizer's vaccine. Whilst both vaccines boosted prime-induced immunity, the latter induced significantly higher numbers of Spike protein

² Jocelyn Solis-Moreira. Mix and match COVID-19 vaccines safe and effective: German study. <https://www.news-medical.net/news/20210609/Mix-and-match-COVID-19-vaccines-safe-and-effective-German-study.aspx> (9 June 2021)

specific CD4 and CD8 T lymphocytes and, in particular, high titers of neutralizing antibodies against the B.1.1.7, B.1.351 and the P.1 variants SARS-CoV-2.^{3,4}

Mixing doses of different vaccines is not new. Following the ebola epidemic of 2014, Johnson & Johnson produced a two-dose vaccine containing other carrier viral vectors (an adenovirus and a modified version of a poxvirus) that provided long-lasting immunity. Mixing and matching

COVID-19 vaccines could solve issues of vaccine paucity in countries struggling for supplies. In the bargain, it would also boost the body's immunity to variants of the virus.⁵

Several countries, including Canada and Spain, have already approved such dose-mixing mainly due to concerns about rare and potentially fatal blood clots linked to the AstraZeneca vaccine. In Canada and across several European countries, people who received AstraZeneca for their first dose can now get either the Pfizer or Moderna vaccine for their second. Canada's decision comes after regulators in Australia and overseas concluded AstraZeneca was the likely cause of a rare side effect called thrombosis with thrombocytopenia syndrome (TTS).

Scientists in the US are starting to give a fully vaccinated person another (third) jab. Participants are given a booster shot of the Moderna vaccine - whether they previously got 2 shots of an mRNA vaccine from Pfizer or Moderna or one adenovirus based vaccine from Johnson and Johnson. Virus expert Joseph Hyser has been fully vaccinated by January. Yet, when he was offered a third dose - this time from Moderna - he agreed readily and the virologist at Baylor College of Medicine went and took the third jab. He felt more side effects from Moderna second booster though.

The above facts and figures are for your kind consideration. If you are interested, we can provide you more relevant information, to help you decide favorably for a match mix dosing of the vaccine to Covid-19, in the given circumstances of the paucity of Covishield vaccine. We at Bangladesh Health Watch are at your service to help you decide in favor of a greater good to the people of the country.

³ Joana Barros-Martins et al. Humoral and cellular immune response against SARS-CoV-2 variants following heterologous and homologous ChAdOx1 nCoV-19/BNT162b2 vaccination heterologous and homologous ChAdOx1 nCoV-19/BNT162b2 vaccination. <https://www.medrxiv.org/content/10.1101/2021.06.01.21258172v1>

⁴ Georg Behrens et al. Brief Communication. Humoral and cellular immune response against SARS-CoV-2 variants following heterologous and homologous ChAdOx1 nCoV-19/BNT162b2 vaccination. In Review. natureportfolio. <https://www.researchsquare.com/article/rs-580444/v1>

⁵ Giulia Carbonaro. Safe to mix and match AstraZeneca and Pfizer COVID-19 vaccines, say WHO experts. <https://newseu.cgtn.com/news/2021-06-14/Mixing-and-matching-AstraZeneca-and-Pfizer-works-say-WHO-experts-114pSzEXN0Q/index.html>14-Jun-2021.

With best regards,



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Copy for kind information to:

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3. Professor Dr. Meerjady Sabrina Flora, Additional Director General, DGHS, Mohakhali,
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