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Why two doses of the BNT162b2 mRNA Covid-19 vaccine? A different strategy to speed up the vaccination process: single-dose of the BNT162b2 mRNA Covid-19 –and other - vaccines.

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Why two doses of the BNT162b2 mRNA Covid-19 vaccine?

A different strategy to speed up the vaccination process: single-dose of the BNT162b2 mRNA Covid-19 –and other - vaccines.

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Worldwide vaccination process for Covid-19 has started with a 2-dose approach for all vaccines available and approved now, facing an obvious shortage of doses available for the population.

With reference to the Pfizer vaccine (BNT162b2), Polack et al (1) gave an estimate of vaccine efficacy (VE) for BNT162b2 of 52.4% after dose 1 to before dose 2, as compared to a VE of 94.8% 7 days or more after dose 2.

However, most cases of Covid-19 occurrence were registered in days 1-11, when – as expected – there is no VE.

After day 11, the curve of BNT162b2 diverge from that of placebo, and only 4/41 Covid-19 cases in the BNT162b2 group were observed from day 11 to 21. VE should be therefore 37/41=90%. This estimate is similar to the table from 2 to 7 days after second dose (2 out of 21=95,2%), therefore we can estimate a VE close to 90% already from 11 to 28 days.

Assuming the little effect of the second dose between day 21 and day 33, there is no evidence that the curve in the BNT162b2 group is different from day 12 to 33 compared to day 34-112, or from day 11 to 28 as compared to day 29-112, assuming a 6-day lag for dose 2.

Even if Pollack et al (2) state that their study was not designed to assess the efficacy of a single dose regimen and Walsh et al2 showed higher concentration of recombinant S1-binding-IgG and 50% neutralization titers after dose 2; still, it is important to have a separate estimate of VE after dose 1 excluding the first 12 days.

Considering the Moderna vaccine, Baden et al (3) in the study on the efficacy of the mRNA-1273 SARS-CoV-2 Vaccine found out fewer occurrences of symptomatic SARS-CoV-2 infection after a single dose of mRNA-1273, VE after one dose was estimated estimated at 80.2% (95% CI 55.2, 92.5%) at 28 days (4).

With reference to the Astra Zeneca viral vector vaccine, VE was assessed at 73% (95% CI 49-86%) 22 days after one dose until two weeks after second dose (4).

Based on the analysis oof the published data, given the immediate importance of vaccination and the limited availability of BNT162b2 (Pfizer), the possibility of prioritizing a single dose strategy – with a possible second dose when adequate availability will be reached – could be considered. This line of reasoning can be applied to other vaccines as well and it is the background for the UK Joint Committee for Vaccination and Immunization (JCIV) to delay the second dose of the Astra Zeneca vaccine to 120 days (4).

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