COVID-19 疫苗系列專欄：接種完疫苗後，如果還是感染到 COVID-19，會傳染給別人嗎？

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個人感染 COVID-19 的機率，和當地是否為高流行地區、是否接種疫苗、非藥物性介入措施(nonpharmaceutical interventions)的落實程度、以及病毒變異株對疾病的傳播力和對疫苗保護力的影響有關[1–2]。就目前的文獻來看，無論是接種哪個廠牌的 COVID-19 疫苗，均可降低感染、重症或死亡的風險，並可能降低傳播力[3–7]。

由於呼吸道的病毒量或Ct值(cycle threshold value)與是否能培養出病毒和COVID-19的傳播力有關[8–9]，因此文獻中常將呼吸道的病毒量或Ct值，作為評估傳染力的指標。

從AstraZeneca (AZ)疫苗在英國的臨床試驗來看，受試者分為接種兩劑AZ疫苗組及接種腦膜炎疫苗的對照組，分析確診為COVID-19感染的個案。無論是否有症狀，疫苗組確診個案的Ct值都顯著比對照組來得高（疫苗組 vs 對照組Ct值中位數：28.8 vs 20.2），亦即AZ疫苗組病毒量顯著較低。此外，疫苗組有症狀的確診個案可自上呼吸道檢驗到病毒的時間(duration of viral shedding)也較對照組短（疫苗組 vs 對照組中位數：1周 vs 2周）[10]，顯示即便接種疫苗後仍感染COVID-19，依舊可縮短具傳染力的時間。

即使僅接種一劑疫苗後感染，病毒量也會較未接種疫苗者為低，且疫苗降低病毒量的效果在接種後12天起更顯著。以色列研究顯示，接種第一劑Pfizer-BioNTech (BNT)疫苗12天後確診為COVID-19感染者其病毒量較接種後第1–11天即確診的感染者顯著降低（接種後第12–37天才確診 vs 接種後第1–11天即確診之平均Ct值：RdRp gene: 26.7 vs 25 ± 0.2; N gene: 26.4 vs 25 ± 0.2; E gene: 24.6 vs 23 ± 0.2）。本研究同時也比較了接種一劑BNT疫苗及未接種疫苗的族群，發現接種疫苗12天後才感染COVID-19者，病毒量相較於未接種疫苗組，約下降2.8–4.5倍，且達統計學上的顯著差異[11]。

蘇格蘭針對接種過一劑 AZ 或 BNT 疫苗的醫護人員及其家人的研究顯示，醫護人員接種疫苗 14 天後即使仍感染 COVID-19，但其家人感染 COVID-19 的風險相較於未接種疫苗者顯著降低(HR: 0.70; 95% CI: 0.63-0.78)[12]，顯示接種一劑疫苗即可降低部分 COVID-19 傳播風險。

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以上研究進行時，全球主要流行病毒株仍是武漢株，目前暫無針對變異株影響疫苗接種後傳染力的資料。但由以上的文獻可知，雖接種疫苗無法完全避免 COVID-19 的感染，但即使僅接種一劑，已可縮短感染後具傳染力的時間、降低病毒量與傳播風險。因此目前世界各國亦針對已接種疫苗的族群提出不同社交場合可放寬非藥物性介入措施的建議，符合條件的接種對象，均應儘速接種疫苗，以降低罹病機率與減少傳播[1, 13]。

參考文獻

1. European Centre for Disease Prevention and Control. Interim guidance on the benefits of full vaccination against COVID-19 for transmission and implications for non-pharmaceutical interventions. Available at: https://www.ecdc.europa.eu/en/publications-data/interim-guidance-benefits-full-vaccination-against-covid-19-transmission.
2. European Centre for Disease Prevention and Control. Risk of SARS-CoV-2 transmission from newly-infected individuals with documented previous infection or vaccination. Available at: https://www.ecdc.europa.eu/en/publications-data/sars-cov-2-transmission-newly-infected-individuals-previous-infection.
3. Pawlowski C, Lenehan P, Puranik A, et. al. FDA-authorized COVID-19 vaccines are effective per real-world evidence synthesized across a multi-state health system. Med 2021; 2(8): 979–92.
4. European Medicines Agency. COVID-19 vaccines: authorised. EMA; 2021. Available at: https://www.ema.europa.eu/en/human-regulatory/overview/public-health-threats/coronavirus-disease-covid-19/treatments-vaccines/covid-19-vaccines.
5. Voysey M, Costa Clemens SA, Madhi SA, et al. Single-dose administration and the influence of the timing of the booster dose on immunogenicity and efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine: a pooled analysis of four randomised trials. Lancet 2021; 397(10277): 881–91.
6. Dagan N, Barda N, Kepten E, et al. BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting. N Engl J Med 2021; 384(15): 1412–23.
7. Centers for Disease Control. Science Brief: Background Rationale and Evidence for Public Health Recommendations for Fully Vaccinated People. Available at: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html.
8. Marks M, Millat-Martinez P, Ouchi D, et al. Transmission of COVID-19 in 282 clusters in Catalonia, Spain: a cohort study. Lancet Infect Dis 2021; 21(5): 629–36.
9. Kim MC, Cui C, Shin KR, et al. Duration of Culturable SARS-CoV-2 in Hospitalized Patients with Covid-19. N Engl J Med 2021; 384(7): 671–3.

10. Emary K. RW, Golubchik T, Aley P, et al. Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B.1.1.7): an exploratory analysis of a randomised controlled trial. Lancet 2021; 397(10282): 1351–62.
11. Levine-Tiefenbrun M, Yelin I, Katz R, et al. Initial report of decreased SARS-CoV-2 viral load after inoculation with the BNT162b2 vaccine. Nat Med 2021; 27(5): 790–2.
12. Shah AS, Gribben C, Bishop J, et al. Effect of Vaccination on Transmission of SARS-CoV-2. N Engl J Med 2021; 385: 1718–20.
13. Centers for Disease Control. Interim Public Health Recommendations for Fully Vaccinated People. Available at: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html.