Clinical Infectious Diseases
CORRESPONDENCE

Effectiveness of Booster mRNA Vaccines Against SARS-CoV-2 Infection in an Elderly Population, South Korea, October 2021–January 2022

To the Editor—We read with great interest the recent article by Drawz et al in which the authors explored the potential role of messenger RNA (mRNA) vaccine's booster doses against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)–related hospitalizations [1]. In South Korea, a coronavirus disease 2019 (COVID-19) vaccination campaign was initiated starting on 26 February 2021. The primary series vaccines available for persons aged 60+ years were ChAdOx1 nCoV-19 (AstraZeneca) and BNT162b2 mRNA (Pfizer BioNTech) COVID-19 vaccines, whereas booster vaccinations with mRNA vaccines were recommended starting in October 2021. We evaluate the impact of the booster mRNA vaccines against SARS-CoV-2 in preventing infection, severe disease, and death in all persons aged 60+ years in South Korea.

We conducted a nationwide retrospective cohort study to estimate the impact of booster vaccination in all persons aged 60+ years who received 2 doses of COVID-19 vaccines at least 5 months prior. Our analysis was based on an integrated database from the Korea Disease Control and Prevention Agency, which collects and merges all polymerase chain reaction confirmed SARS-CoV-2 cases and their vaccination status. All suspected COVID-19 cases, regardless of symptoms, were mandated to be tested with polymerase chain reaction. The data included age, sex, primed vaccine type, vaccination dates, and SARS-CoV-2 infection status. The observed period was 12 October 2021–22 January 2022. Delta variant dominated from October through December 2021, whereas Omicron variant has emerged since late November 2021 and reached 80% by the end of observation.

We first compare the rates of SARS-CoV-2 infection, severe disease (requiring high-flow oxygen support, extracorporeal membrane oxygenation, or continuous renal replacement therapy), and death by sex, geographic regions, number of vaccinations, and vaccine types. Nonbooster and booster person-days consisted of follow-up days of those who never received booster vaccines, as well as days before being vaccinated or censored (Supplementary Figure 1). Time-dependent Cox proportional hazard model was used, and hazard ratios with 95% confidence intervals from an adjusted model with covariates were included to compare the rates.

Between 12 October and 23 February 2022, a total of 10 999 292 persons were eligible to be included in the analysis, with 1 118 289 931 observed person-days (Table 1). Among the nonbooster group, the death rate was 0.16 per 100 000, which was higher than that of the booster group (0.02 per 100 000), resulting in a hazard ratio of 0.2% against death. Supplementary Figure 2 shows that at 98 days of the observation period, severe disease (77 vs 1803) and death (40 vs 1080) occurred less in the booster group compared with the nonbooster group.

Table 1. SARS-CoV-2 Infection, Severe Disease, and Deaths in mRNA and Viral Vector Vaccine-Primed and Boostered Persons Aged 60+ Years

	Total		Infection		Severe Disease		Death	
Variables	N	Person-day	n	Rate[a]	n	Rate[a]	n	Rate[a]
Sex								
Male	5 017 029	510 001 707	36 378	7.13	1316	0.25	694	0.13
Female	5 982 263	608 288 224	39819	6.54	771	0.12	556	0.09
Geographic region								
Metropolitan area	5 372 900	545 250 909	56 381	10.34	1574	0.28	914	0.16
Nonmetropolitan area	5 626 392	573 039 022	19 816	3.45	513	0.08	336	0.05
Booster vaccination								
No booster	629 464	697 146 502	58 291	8.36	1804	0.25	1082	0.15
Booster	10 127 057	278 003 524	7509	2.70	81	0.02	42	0.01
Primed vaccine type (nonbooster)								
mRNA vaccines	202 688	20 387 562	5569	27.31	489	2.39	406	1.99
Viral vector vaccines	422 319	41 997 898	23 017	54.80	1035	2.46	665	1.58
Heterologous	4457	437 891	331	75.58	12	2.74	10	2.28
Primed – booster vaccine type (booster)								
mRNA – mRNA vaccines	3 110 923	316 817 301	9853	3.10	186	0.05	69	0.02
Viral vector – mRNA vaccines	7 055 573	717 952 945	36 511	5.08	352	0.04	95	0.01
Heterologous – mRNA vaccines	203 332	2 0 696 334	916	4.42	13	0.06	5	0.02

Abbreviation: mRNA, messenger RNA.

[a]Incidence rate, per 100 000 person-day.

Our finding of impact in booster vaccine recipients is consistent with other studies. In Israel, the rate of confirmed infection was lower in the booster group than in the no booster group by a factor of 11.3 (95% confidence interval, 10.4–12.3) [2]. Our finding adds that the booster vaccination with mRNA vaccines were effective in ChAdOx01 or BNT162b2 vaccine-primed persons aged 60+ years. Our results demonstrate vaccine effectiveness of booster doses, as in line with previous findings, which may implicate the vaccination strategy in the elderly group.

Supplementary Data

Supplementary materials are available at *Clinical Infectious Diseases* online. Consisting of data provided by the authors to benefit the reader, the posted materials are not copyedited and are the sole responsibility of the authors, so questions or comments should be addressed to the corresponding author.

Notes

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