Letter to the Editor

Severe Covid-19 Vaccine Side-Effects are Rare in Older Adults yet are Linked With Depressive Symptoms

COVID-19 vaccine development should have been the “light at the end of the tunnel.” However, antivaccinations attitudes and hesitation are common,¹ even among older adults. Such hesitancy has been positively associated with depression, potentially due to concerns about vaccine side-effects.² We tested the association between depression and vaccine side-effects in older adults, and hypothesized that, like physical illness,³ depression should increase with each additional side-effect.

This survey was conducted via iPanel (a probability based panel, see⁴ for additional details) to obtain good representation of vaccinated Israeli older adults (N = 939, mean age 68.9 ± 3.43 [range 65−85]; 59.9% females, 46.9% academic education; 75% married). At time of study (January 25th-February 4th, 2021), respondents were 28.15 ± 9.47 days after the first Pfizer vaccine [BNT162b2mRNA]. Participants completed web-based questionnaires comprising demographics, self-rated health, COVID-19 vaccination side-effects and depressive symptoms. Respondents provided informed consent to procedures approved by the last author’s university institutional review board. The extent of suffering from side-effects (reported by the FDA¹ and the Israeli Ministry of Health²) was examined (1-not at all to 5-very severely). We computed the number of side-effects endorsed as severe/very severe. Depressive symptoms were assessed by the PHQ-9 questionnaire (α = 0.84), the clinical cut-off score was ≥10.⁵ A single item indexing self-rated health was used (1-not healthy to 5-very healthy).⁶

Vaccination side-effects were rare (see Supplementary file). Prevalence of clinical depressive symptom levels was 11%. Clinical depression was logistically regressed on vaccination side-effects. Those with one severe side-effect were twice as likely to report clinical depressive symptom levels (OR = 2.30 [95% CI = 1.26−4.18], Wald = 7.48; df = 1, p <0.0001), those with 3+ severe side-effects were 7.34 times more likely to report clinical depressive symptoms (OR = 7.19 [95% CI = 3.58−14.42]; Wald = 18.195; df = 1, p <0.0001). Controlling for relevant variables (demographics, days since vaccination, and self-rated health) yielded similar results (see Supplementary file).

Although severe vaccination side effects were rare, they positively linked with depressive symptoms. The large scale of global vaccination suggests a potentially important mental health burden for those with side-effects. Depressive symptoms, if untreated, may be detrimental to older adults’ physical and mental health.⁷

Limitations of this study include narrowly focusing on Pfizer’s vaccination and older adults within a narrow age range, potentially mitigating generalizability to other vaccines and ages. Additionally, the directionality of the depression−side-effects link could not be discerned from our cross-sectional data. High depression levels in older adults during COVID-19⁷ may lead to side-effects⁸.

¹ https://www.fda.gov/media/144414/download
likewise, side-effects may lead to depression.\textsuperscript{8} Future studies measuring these variables across time points may enable discerning causality provided suitable models are applied.\textsuperscript{9} Experimental studies may also be revealing, e.g., comparing vaccination side-effects in a group of older adults whose depression rate was experimentally lowered (e.g., via an intervention) to a control group.

The current data suggest that reported side-effects may be useful in identifying depression in older adults. Presenting vaccinated older adults with accurate information regarding depressive symptoms and treatment centers, should be helpful. Psycho-educational interventions emphasizing that vaccination side-effects neither challenge vaccine safety nor efficacy, may aid in reducing potential depressive symptoms.

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**SUPPLEMENTARY MATERIALS**

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jagp.2021.09.010.

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**References**


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**DISCLOSURE**

No disclosures to report.