

Key Journal articles

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- Yale BMJ article

[Immunological and Antigenic Signatures Associated with Chronic Illnesses after COVID-19 Vaccination](#) Battacharjee et al 2025

Abstract: *COVID-19 vaccines have prevented millions of COVID-19 deaths.*

Intro: *The rapid development and deployment of COVID-19 vaccines have been pivotal in mitigating the impact of the pandemic¹. These vaccines have significantly reduced severe illness and mortality associated with SARS-CoV-2 infection². Additionally, vaccinated individuals experience a lower incidence of post-acute sequelae of COVID-19 (PASC) or long COVID, thus highlighting an additional potential benefit of receiving the COVID-19 vaccines^{3, 4}*

- The study was small with 42 cases reporting symptoms of PVS post COVID-19 vaccination and 22 controls with no symptoms of PVS following vaccination.
- The authors defined PVS as being characterised by a wide range of symptoms including exercise intolerance, excessive fatigue, numbness, brain fog, neuropathy, insomnia, palpitations, myalgia, tinnitus, headache, burning sensations, dizziness.

- The authors note that PVS is not officially recognised by health authorities and there is no consensus definition of this syndrome.
- The key findings from the study were that:
 - There were potential differences in the immune profiles of individuals with PVS, with PVS cases showing reduced amounts of certain immune cells (CD4 memory and effector cells) and higher levels of other immune cells (CD8 T-cells).
 - PVS participants also had lower levels of anti-spike protein antibodies, but also had received fewer doses of vaccine.
 - Serological evidence suggestive of recent Epstein-Barr Virus reactivation was observed more frequently in cases than controls.
 - People with PVS had elevated levels of circulating SARS-CoV-2 spike (S) protein compared to controls.
- There are several limitations to this study including the **very small sample size** (including insufficient subgroup numbers to adequately assess for the effect of previous SARS-CoV-2 infection), **lack of analysis of potential confounders such as other medical conditions and medication use** and **lack of a standardised case definition for PVS noting that the symptoms of PVS are general symptoms that are associated with a range of other conditions.**