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# Retinal Vascular Occlusion after COVID-19 Vaccination A Nationwide Cohort Study

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## Introduction

**Background:**

- The Pfizer-BioNTech BNT162b2 SARS-CoV-2 vaccine was a milestone in containing the COVID-19 pandemic.
- Despite demonstrated efficacy, concerns arose about possible rare adverse effects, including retinal vascular occlusion (RVO).
- RVO includes retinal vein occlusion (RVO) and retinal artery occlusion (RAO), with distinct risk factors and potential for severe vision loss.

**Objective:**

- To assess whether there is an association between receiving anti-SARS-CoV-2 vaccinations (including multiple booster doses) and the development of RVO in a large nationwide cohort in Israel.

## Methods

**Study Design & Setting:** Retrospective cross-sectional study using data from Clalit Health Services (CHS), the largest healthcare provider in Israel.

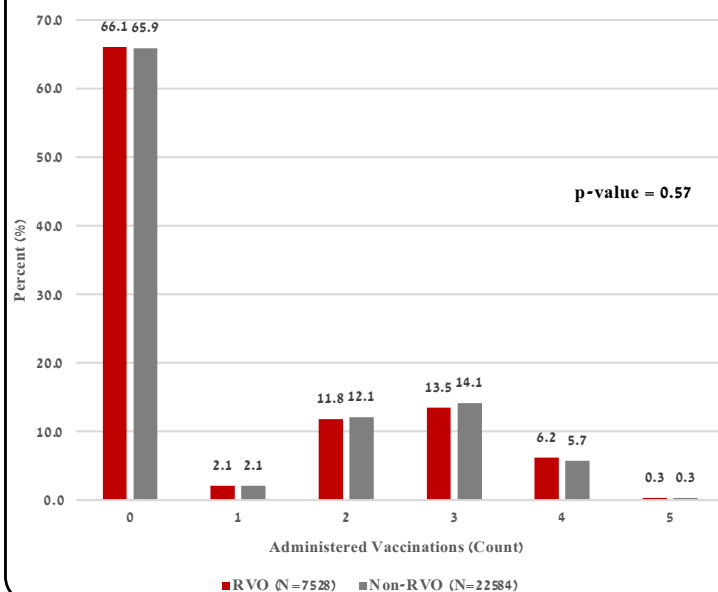
**Population:** Individuals  $\geq 18$  years with newly diagnosed RVO (ICD-9 code 362.3) between December 2017 and January 2023 (n=7,528). Matched controls (1: 3) with no RVO diagnosis during the same period (n=22,584).

**Main Exposure:** Number of COVID-19 vaccine doses (0 to 5).

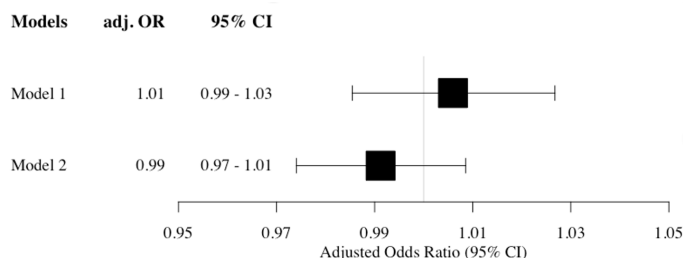
**Outcome:** Newly diagnosed RVO.

**Covariates:** Age, gender, BMI, smoking status, prior COVID-19 infection, hypertension, hyperlipidemia, diabetes, cerebrovascular accident, peripheral vascular disease, chronic heart failure, glaucoma, and arthropathy.

Distribution of Vaccination Doses Among Study Groups



Multivariate Analysis for Retinal Vascular Occlusion after Vaccination



## Results

**Total N=31,112:** RVO cases (n=7,528) vs. matched controls (n=22,584).

Mean age:  $65.0 \pm 15.9$  years, slightly higher in RVO group (p=0.009).

Similar gender and BMI distributions between groups.

**Vaccination Status:** Doses ranged from 0 to 5; 34% received  $\geq 1$  dose by index date. No significant difference in vaccination distribution between RVO and non-RVO groups (p=0.57).

**Comorbidities:** RVO group had higher prevalence of hypertension, hyperlipidemia, glaucoma, peripheral vascular disease, and cerebrovascular accident. Diabetes prevalence was similar between groups.

**Multivariate Analysis:** Anti-SARS-CoV-2 vaccination (dose count) was not significantly associated with RVO development (adjusted OR  $\sim 1.0$ ). Comorbidities (e.g., hypertension, hyperlipidemia) did not alter the lack of association after adjustment.

## Discussion

**- No significant link was found between COVID-19 vaccination and RVO occurrence in this large-scale, nationwide cohort.**

- Even with booster doses, adjusted ORs remained near 1.

- Comorbidities (e.g., hypertension) were more frequent in RVO cases but did not confound the null association with vaccination.

**Clinical Implications:**

- These findings support the retinal safety of current mRNA COVID-19 vaccines.

- Booster doses remain critical in COVID-19 prevention, with no evidence of increased RVO risk.

- Continued vigilance and documentation of post-vaccination ocular events are warranted, but routine withholding of vaccines due to RVO concerns is not supported by these data.