

# Anti-Inflammatory Augmentation in Schizophrenia

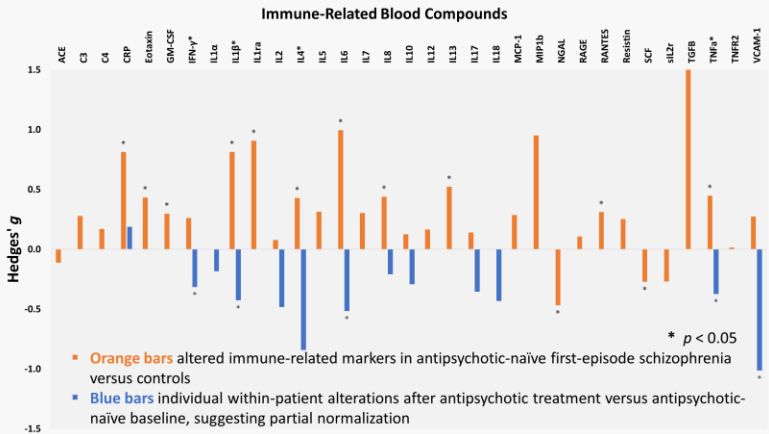
## Meta-analytic Evidence and Emerging Biomarker Findings



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### 1. WHY INFLAMMATION MATTERS

Immune-Related Blood Biomarkers Before and After Antipsychotic Treatment in Antipsychotic-Naïve First-Episode Schizophrenia (Submitted)



**BACKGROUND & OBJECTIVE**

- Immune dysregulation may contribute to schizophrenia
- Negative symptoms remain difficult to treat
- Anti-inflammatory augmentation may improve symptoms
- To evaluate adjunctive anti-inflammatory treatments in schizophrenia spectrum disorders

**METHODS**

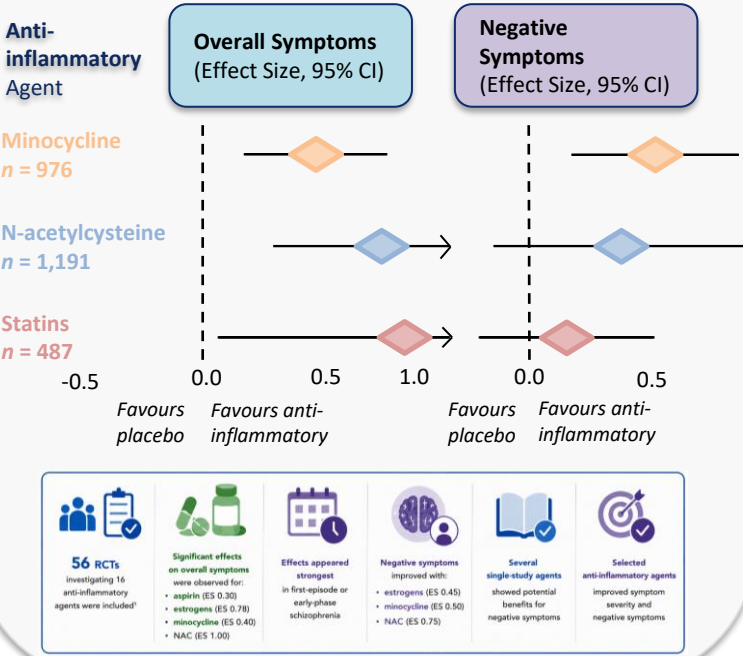
- Systematic review and random-effects meta-analysis of double-blind RCTs
- PubMed, Embase, ClinicalTrials.gov, and Cochrane searched from inception
- Effect sizes (Hedges' *g*) calculated from change scores

**DISCUSSION**

- Anti-inflammatory augmentation may improve symptom severity, particularly negative symptoms
- Effects appear strongest in early psychosis
- Recent NAC trials suggest treatment dose and duration are important for efficacy
- Immune-related biomarkers partially normalize with treatment
- Patient selection, immune dysregulation, treatment dose, and duration may influence treatment response

### 2. WHAT DOES THE EVIDENCE SHOW?

Updated (May 2026) Meta-Analysis of Randomized Controlled Trials: Efficacy of Signals on Symptoms



### 3. WHAT'S NEW? FOCUS ON NAC & STATINS

**N-Acetylcysteine (NAC) Augmentation Update**

*Recent randomized trials generally reported neutral effects*

**IMPLICATIONS**

- NAC efficacy may depend on treatment dose and duration, inflammatory status, and negative symptom severity
- Biomarker-guided stratification may improve treatment selection
- Higher and longer NAC dosing may be needed for adequate blood-brain barrier penetration (≥3000 mg/day; ≥24 weeks)

**Statin Use Associated With Reduced Negative Symptoms (Unpublished Data)<sup>2</sup>**

*Longitudinal study in schizophrenia spectrum disorders*

Statin users *n* = 264

Non-statin users *n* = 2,952

~30% lower negative PANSS scores after one year

Promising real-world evidence – RCTs are needed to confirm causality<sup>2</sup>

<sup>2</sup>Dielemans et al. 2026 (unpublished data)

**CONCLUSIONS**

- Minocycline, NAC, estrogens, and statins improved symptoms; some also improved negative symptoms
- Statins show emerging positive findings
- Findings support a role for immune dysregulation in schizophrenia
- Biomarker-guided treatment approaches are needed