Cochrane
Multiple Sclerosis and Rare Diseases of the Central Nervous System
Visual abstract created by Valentina Redaelli

Tramacere I, Virgili G, Perduca V, Lucenteforte E, Benedetti MD, Capobussi M, Castellini G, Frau S, Gonzalez-Lorenzo M, Featherstone R, Filippini G. Adverse effects of immunotherapies for multiple sclerosis: a network meta-analysis. *Cochrane Database of Systematic Reviews 2023*, Issue 11. Art. No.: CD012186. DOI: 10.1002/14651858.CD012186.pub2.

Are there adverse effects in the immunotherapies for Multiple Sclerosis?

- Immunotherapies used to treat multiple sclerosis (MS) or clinically isolated syndrome (CIS) appear not to increase serious health events, compared to sham drugs (placebo).
- Many of these drugs have unwanted effects and, for some of them, more people included in studies dropped out because of side effects compared to sham drugs.
- Serious health events are relatively rare in people with multiple sclerosis, and were not well reported in the studies.

PICO

P Adults diagnosed with MS or CIS

I 25 different immunosuppressive and immunomodulatory drugs

C Placebo or active agents

O SAEs and withdrawals due to AEs, at 1 or 2 years

EVIDENCE

123 RCTs with placebo control

57,682 participants

Up-to-date until March 2022

RESULTS — CERTAINTY OF EVIDENCE

Serious adverse events (SAEs)

Acceptable safety: ≤ 1 extra SAE per 18 people compared to placebo

Decrease SAEs	
• Interferon beta-1a (Avonex), Dimethyl fumarate, Glatiramer acetate	**Low**
Comparable safety to placebo	
• Teriflunomide	**Moderate**
• Ocrelizumab, Ozanimod, Interferon beta-1b, Interferon beta-1a (Rebif), Natalizumab, Fingolimod, Laquinimod	**Low**
Unclear safety compared to placebo (imprecise data)	
• Cladribine, Siponimod, Ofatumumab, Rituximab	**Low**

84 studies

Withdrawals due to adverse events (AEs)

Acceptable safety: ≤ 1 extra withdrawals per 31 people compared to placebo

Increased withdrawals due to AEs	
• Teriflunomide, Glatiramer acetate, Fingolimod, Interferon beta-1a (Rebif), Daclizumab, Interferon beta-1b	**Low**
Unclear safety compared to placebo (imprecise data)	
• Ofatumumab	**Low**

105 studies