It is well-established that major depressive disorder is associated with elevated serum inflammatory biomarkers such as IL-6, CRP, TNF-alpha and cortisol. These elevated biomarkers are also linked to the somatic symptoms seen in depression such as pain and low energy. Antidepressant pharmacotherapy and neuromodulation (ECT) have been shown to reduce the levels of inflammatory biomarkers in responding patients. Psychotherapy, especially CBT, is well known to improve depressive symptoms. Here, we review the literature of controlled studies reporting the effects of psychotherapy on serum pro-inflammatory markers.

### Methods

We conducted a systematic search of online databases (i.e., PubMed, Web of Science, Google Scholar, PsychINFO and Cochrane Library) up to January 2023, using key words such as psychotherapy, inflammation, CBT, and inflammatory biomarkers.

### Results

Seven studies met our inclusion and exclusion criteria, including 4,972 subjects. All reported a decline in one or more inflammatory biomarkers, including IL-6 and CRP in responders, but not in non-responders.

### Discussion

There is a strong relationship between depression and various pro-inflammatory biomarkers. Evidence-based psychotherapeutic interventions, such as CBT, appear to be associated with a reduction in pro-inflammatory biomarkers, similar to what’s observed with antidepressant pharmacotherapy. This suggests that psychotherapy can modulate the immune status of patients with depression. There are also numerous studies reporting that adjunctive anti-inflammatory agents, including NSAIDs, omega-3 fatty acids, COX-2 inhibitors and minocycline, potentiate the antidepressant efficacy. Future studies should examine the potential use of anti-inflammatory agents, especially omega-3 since it is relatively safe, in patients with depression receiving psychotherapy which may potentiate efficacy. Future studies should also measure the resolution of inflammation by measuring the levels of pro-inflammatory markers before and after psychotherapy.

### Conclusion and Future Directions

There is a strong relationship between depression and various pro-inflammatory biomarkers. Evidence-based psychotherapeutic interventions, such as CBT, appear to be associated with a reduction in pro-inflammatory biomarkers, similar to what’s observed with antidepressant pharmacotherapy. This suggests that psychotherapy can modulate the immune status of patients with depression. There are also numerous studies reporting that adjunctive anti-inflammatory agents, including NSAIDs, omega-3 fatty acids, COX-2 inhibitors and minocycline, potentiate the antidepressant efficacy. Future studies should examine the potential use of anti-inflammatory agents, especially omega-3 since it is relatively safe, in patients with depression receiving psychotherapy which may potentiate efficacy. Future studies should also measure the resolution of inflammation by measuring the levels of pro-inflammatory markers before and after psychotherapy.

### References


