

Psychostimulant Use Is Associated With Increased Risk of Carpal Tunnel Syndrome in Adults With ADHD

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Introduction:

The use of psychostimulant medications has grown substantially as increasing numbers of patients with **Attention-Deficit/Hyperactivity Disorder (ADHD)** are prescribed these agents for symptom management. While highly effective in improving attention and focus, psychostimulants are associated with several adverse effects, including the upregulation of cytokine production and increased inflammation. One potential consequence of this elevated inflammatory state is the development of **carpal tunnel syndrome (CTS)**, in which swelling within the carpal tunnel compresses the median nerve and produces significant sensory and motor symptoms. Given the widespread and rising use of psychostimulants, further research is warranted to investigate whether their use in patients with ADHD is associated with an elevated risk of developing CTS.

Methods:

A retrospective cohort study was conducted using the TriNetX Research Network, a large database of de-identified electronic health records. Adult patients (≥ 18 years) diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) after January 1, 2010, were identified and divided into two cohorts:

1. Psychostimulant users — patients prescribed any ADHD-related psychostimulants or nootropics (ICD codes N06B, N06BX).
2. Non-users — patients with ADHD but without any documented psychostimulant prescriptions.

Propensity score matching (1:1) was performed to control for known confounders in carpal tunnel syndrome (CTS) development, including age at index event, sex, obesity, diabetes mellitus, gout, rheumatoid arthritis, and repetitive overuse injuries.

The primary outcome was a diagnosis of CTS, identified using ICD-10 codes. Measures of association were calculated, including risk ratios (RR), odds ratios (OR), and 95% confidence intervals (CI).

Subgroup analyses were conducted for male-only and female-only cohorts using the same methodology, excluding sex as a matching variable.

Results:

After propensity score matching, **596,997 patients** were included in each cohort. ADHD patients prescribed psychostimulants demonstrated a **significantly increased risk** of developing **carpal tunnel syndrome (CTS)** compared to non-users (**RR = 1.529; 95% CI, 1.493–1.566; $p < 0.0001$; OR = 1.544; 95% CI, 1.507–1.582**).

Male subgroup analysis: Psychostimulant use was associated with a **52.4% increased risk** of CTS (**RR = 1.524; 95% CI, 1.461–1.589; $p < 0.0001$; OR = 1.534; 95% CI, 1.470–1.600**).

Female subgroup analysis: Similarly, female ADHD patients on psychostimulants showed a **51.3% increased risk** (**RR = 1.513; 95% CI, 1.468–1.559; $p < 0.0001$; OR = 1.532; 95% CI, 1.485–1.580**).

All associations were statistically significant, and findings were consistent across generalized and sex-stratified analyses.

Discussion:

This study demonstrates a significant and consistent association between psychostimulant use and an increased risk of developing Carpal Tunnel Syndrome (CTS) among adults with ADHD. Across generalized, male-only, and female-only cohorts, psychostimulant use was associated with approximately a 50% higher risk of CTS, and all findings were highly statistically significant.

The results are clinically relevant as well, given the rapid rise in psychostimulant prescriptions. Between 2019 and 2023, ADHD prescriptions increased by 23.8%, with stimulants accounting for the majority. As prescription rates continue to grow, these findings underscore the importance of recognizing potential orthopaedic complications associated with long-term psychostimulant usage.

The biological plausibility of these findings is supported by existing literature. Psychostimulants are known to increase cytokine production and systemic inflammation, which may contribute to median nerve compression and heightened CTS risk as predicted.

However, several limitations should be acknowledged. Diagnoses and medication exposure were based on ICD and RxNorm codes, which may introduce misclassification bias. Additionally, despite propensity matching for key confounders, residual confounding remains possible. Differences in ADHD diagnosis age ranges and persistent imbalances in some matched variables may also influence results.

Overall, these findings highlight a previously underrecognized musculoskeletal risk associated with psychostimulant therapy and warrant further prospective studies to explore underlying mechanisms and guide safer ADHD management strategies.

Significance/Clinical Relevance:

With the rapid rise in psychostimulant prescriptions for ADHD, understanding their potential impact on musculoskeletal health has become increasingly important. This study demonstrates a significant association between psychostimulant use and increased risk of Carpal Tunnel Syndrome (CTS), a condition that can impair function, quality of life, and overall productivity. These findings highlight the need for clinicians, orthopedic practitioners, and prescribing providers to consider these potential orthopaedic implications when initiating or managing long-term psychostimulant therapy for ADHD patients. Increased awareness may support early recognition, prevention strategies, and individualized treatment decisions, ultimately improving patient care.