Supplementary Online Content

Chang Z, Quinn PD, Hur K, et al. Association between medication use for attention-deficit/hyperactivity disorder and risk of motor vehicle crashes. *JAMA Psychiatry*. Published online May 10, 2017. doi:10.1001/jamapsychiatry.2017.0659

eMethods. Supplemental Methods

eTable 1. Associations Between ADHD and risk of Motor Vehicle Crashes (MVCs)

eTable 2. Risk of Motor Vehicle Crashes (MVCs) in ADHD Patients With and Without Medication Compared With Population Controls

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods. Supplemental Methods

Population attributable fraction

We calculated the population attributable fraction (PAF) of MVCs due to non-medication with following formula:

$PAF = Pr(X=1|Y=1)(1-RR^{-1})$,

where $Pr(X=1|Y=1)$ is the observed exposure prevalence among months at which there was a MVC, and RR is the relative risk. Because the outcome is rare, RR was replaced by OR from the conditional logistic regression, and the reciprocal of OR was used to calculate the PAF of not being exposed to the protective factor. Importantly, the within-individual OR was adjusted for all the unmeasured static and measured time-varying confounding factors.

Reference:

Sjölander, A. 2016. Attributable Fractions. Wiley StatsRef: Statistics Reference Online. 1–7.

Sensitivity analyses

The first and second analyses excluded patients who received other psychotropic medication or psychotherapy, respectively, in order to test whether the observed associations were explained by other treatments. The third analysis examined the association in a cohort with incident diagnoses of ADHD (i.e., patients who had no diagnosis of ADHD or prescription of ADHD medication for at least one year before the diagnosis), which permitted evaluation of associations among patients who were new to ADHD treatment. The fourth analysis censored individuals at first MVC event in the incident diagnosis cohort, which precluded bias due to reverse causation (i.e., such that the prescription of ADHD medication was influenced by an MVC event). The fifth analysis examined the associations by age groups because of age-related differences in the risk of MVC. The sixth analysis excluded the last month before disenrollment because the coverage in the last month might be incomplete. The seventh analysis examined the association among people with index dates 2005-2009 vs. 2010-2014 as average severity of treated patients might has changed over time. The eighth analysis extended the medicated periods by one month so that the definition of un-medicated months following treatment discontinuation was more conservative. To explore whether the association depended on the type of ADHD medication (stimulant vs non-stimulant), the ninth analysis examined the associations with only stimulant medication as the exposure (excluding atomoxetine). Because we could not differentiate whether the patient was a driver or passenger in a MVC event, the tenth analysis restricted the outcome to injuries of motorcyclist (assuming that most injured patients were drivers). The eleventh analysis used a broader outcome definition that included any inpatient or outpatient claims for MVC with at least a one month interval between any two claims. Finally, we used selective serotonin reuptake inhibitors (SSRIs) as the exposure (i.e., as a negative control instead of ADHD medication) in the full cohort, in order to compare the general effects of being prescribed medication with the specific effects of ADHD medication.

eTable 1. Associations Between ADHD and risk of Motor Vehicle Crashes (MVCs)

	N of individuals	N with MVCs	OR (95% CI)
Male			
ADHD patients	1 121 032	12 397	1.49 (1.46-1.54)
Controls	1 121 032	8 324	1
Female			
ADHD patients	1 198 384	15 100	1.44 (1.41-1.48)
Controls	1 198 384	10 518	1

eTable 2. Risk of Motor Vehicle Crashes (MVCs) in ADHD Patients With and Without Medication Compared With Population Controls

	N of individuals	N with MVCs	OR (95% CI)
Male			
ADHD patients without medication	154 031	2 100	1.94 (1.80-2.09)
ADHD patients with medication	967 001	10 297	1.46 (1.41-1.52)
Controls	1 121 032	8 324	1
Female			
ADHD patients without medication	126 172	1 877	2.06 (1.91-2.22)
ADHD patients with medication	1 072 212	13 223	1.38 (1.32-1.44)
Controls	1 198 384	10 518	1