

# Effect of ADHD Treatment on Injury Rates

**Source:** Raman SR, Marshall SW, Haynes K, et al. Stimulant treatment and injury among children with attention deficit hyperactivity disorder (ADHD): an application of the self-controlled case series study design. *Inj Prev.* 2013;19(3):164-170; doi:10.1136/injuryprev-2012-040483

To understand whether injury risk is reduced during treatment of attention-deficit/hyperactivity disorder (ADHD), researchers from the University of North Carolina and the University of Pennsylvania retrospectively assessed data from general practices (GP) in the United Kingdom. Information was abstracted on children under 19 years of age with ADHD who had ever been treated with stimulant medication, applying a self-controlled design in which each child served as his/her own control. Every medically-attended injury that occurred in a study child was classified as having occurred either during a treated or an untreated period. A “treated period” was defined as starting on the day a stimulant was prescribed and extending through the end of the period for which medication was supplied, plus a 30-day grace period. The grace period was used to try to minimize misclassification of a period as untreated when a child was actually still using medication. Because injury risk for a given individual can vary with age and season, researchers controlled for these variables in the analysis. The incident rate ratio (IRR) for injuries occurring during a treated period was compared to injuries occurring during an untreated period.

Of 4,234 children diagnosed with ADHD and treated at least once with stimulant medication, 328 had an injury attended medically at the GP, emergency department, or hospital. Most (86.9%) were male, and the mean age of ADHD diagnosis was 9.7 years. The mean observation period was 5.9 years per child. Almost all study participants (98.5%) were treated with methylphenidate. The leading types of incident injuries were fractures, head injuries, sprains/strains, contusions, and superficial skin injuries. The adjusted IRR for injury during treated periods compared to injury during untreated periods was 0.68 (95% CI, 0.50-0.91). Subgroup analysis showed the effect of treatment was most statistically convincing among males and children aged 10 to 14 years.

The authors conclude that periods of stimulant medication use are associated with lower risk of injury among children treated for ADHD. They caution that other factors not measured for individuals in this study might provide alternative explanations for their findings.

## Commentary by

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*Dr Nelson has disclosed no financial relationship relevant to this commentary. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.*

The prevalence of ADHD is believed to have risen to 8% among children aged 4 to 18 years.<sup>1</sup> The risk and severity of injury are reported to be increased among children with ADHD.<sup>2</sup> (See also *AAP*

*Grand Rounds*, July 2009;22[1]:10.<sup>3</sup>) Treatment with stimulant medication is strongly recommended for children aged 6 and up, diagnosed appropriately after systematic evaluation, with the goal of reducing behaviors of inattention, hyperactivity, and impulsivity that can impair academic performance, family functioning, peer relations, and adaptation.<sup>1</sup> While treatment to reduce core ADHD behaviors would seem likely to lower injury risk,<sup>4</sup> most studies on ADHD have not focused on injury outcomes per se, although the results of a randomized controlled trial demonstrated that osmotic-release oral system methylphenidate improved adolescent driving performance as measured by driving simulators.<sup>5</sup>

The authors of the current study offer some fairly compelling evidence that stimulant treatment of ADHD is associated with decreased risk of injury. Strengths of the study include the well-defined case series drawn from a large GP database, examined over a long period of time. The self-controlled design is appealing as a means of eliminating some potential confounders that might affect the results of an observational comparison study. The authors take care to explain the strengths and limitations of this design, pointing out that factors other than medication could have influenced the risk of injury.

The study design is far from perfect, however, in part because the effects of stimulant treatment are time-limited, and the methods allow only a crude approximation of actual treatment exposure in relation to incidence of injury. Further, certain within-individual factors that vary in time might be especially important confounders. For example, periods of school attendance could have been associated with increased medication treatment *and* with decreased risk of medically-attended injury independent of the treatment. Still, the findings here suggest that prevention of injuries in children with ADHD may be considered an additional benefit of stimulant treatment.

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