

### Association between Methylphenidate and Risk of Trauma Related Accident and Emergency Admissions: a self-controlled case-series study

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Children and adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD) are prone to sustaining trauma that requires Accident and Emergency (A&E) admission (1). Methylphenidate (MPH) can reduce ADHD symptoms and thus theoretically may reduce the risk of trauma related A&E admission but previous studies did not provide clear association. This study examined the association between MPH and trauma related A&E admission. 17,381 patients aged 6-19 years who received at least one MPH prescription were identified using Hong Kong Population-based electronic medical records on the Clinical Data Analysis & Reporting System (2001-2013). Using self-control case series study design (2), relative incidence of trauma related A&E admissions comparing periods when patients were exposed to methylphenidate with non-exposed periods. Among 17,381 patients prescribed MPH, 4,934 had at least one trauma related A&E admission. The rate of trauma related A&E admission was lower during exposed compared to non-exposed periods (Incidence-rate-ratio [IRR]=0.91, 95% confidence interval [CI]=0.86-0.97). The findings were similar when only incident trauma episode was assessed (IRR=0.89, 95%CI =0.82-0.96). Similar protective association was found in both male and female patients. In validation analysis using non-trauma related A&E admissions as a negative control outcome, no statistically significant association was found (IRR=0.99, 95%CI=0.95-1.02). Sensitivity analysis testing for uncertainty over the precise period of MPH exposure demonstrated consistent results.

Table 1: Self-controlled case series analyses for association between MPH and trauma related A&E admission

|  | IRR  | 95%CI |      | p-value |
|--|------|-------|------|---------|
| Trauma related A&E admission (n=4,934)     |      |       |      |         |
| All episodes                               | 0.91 | 0.86  | 0.97 | 0.003   |
| First episode only                         | 0.89 | 0.82  | 0.96 | 0.005   |
| Non-trauma related A&E admission (n=8,489) |      |       |      |         |
| All episodes                               | 0.99 | 0.95  | 1.02 | 0.443   |
| First episode only                         | 0.93 | 0.87  | 1.00 | 0.054   |

In conclusion, this study supports the hypothesis that MPH is associated with a reduced risk of trauma related A&E admission in children and adolescents. The use of MPH treatment is shown to prevent injuries in this group of high-risk patients and this potential benefit should be considered in clinical practice.

1. Ertan C *et al.* (2012). *Emerg Med J.* 29(11):911-4
2. Whitaker HJ *et al.* (2006). *Stat Med*, 25(10), 1768-1797.