Cardiovascular safety of methylphenidate among children and young people with attention-deficit/hyperactivity disorder (ADHD): nationwide self controlled case series study

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Abstract

Objective
To determine whether treatment with methylphenidate in children and young people with attention-deficit/hyperactivity disorder (ADHD) was associated with cardiovascular events.

Design
Self controlled case series analysis.

Setting
Nationwide health insurance database, 1 January 2008 to 31 December 2011, in South Korea.

Participants
1224 patients aged ≤17 who had experienced an incident cardiovascular event and had had at least one incident prescription for methylphenidate.

Main outcome measures
A recorded diagnosis (either a primary or secondary cause) of any of the following cardiovascular adverse events: arrhythmias (ICD-10 international classification of diseases, 10th revision) codes I44, I45, I47, I48, I49), hypertension (codes I10-I15), myocardial infarction (code I21), ischemic stroke (code I63), or heart failure (code I50). Incidence rate ratios were calculated with conditional Poisson regression and adjusted for time varying comorbidity and comedication.

Results
Increased risk of arrhythmia was observed in all exposed time periods—that is, periods of treatment with methylphenidate—(incidence rate ratio 1.61, 95% confidence interval 1.48 to 1.74), and the risk was highest in the children who had congenital heart disease. No significant risk of myocardial infarction was observed for all exposed time periods (1.33, 0.90 to 1.98), though risk was higher in the early risk periods between eight and 56 days after the start of treatment with methylphenidate. No significant increased risk was observed for hypertension, ischemic stroke, or heart failure.

Conclusion
The relative risk of myocardial infarction and arrhythmias is increased in the early period after the start of methylphenidate treatment for ADHD in children and young people. Though the absolute risk is likely to be low, the risk-benefit balance of methylphenidate should be carefully considered, particularly in children with mild ADHD.