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Methylphenidate Use by Canadian Children and Adolescents and the Associated Adverse Reactions

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Abstract : Methylphenidate is a first-line treatment drug for attention deficit hyperactivity disorder (ADHD), a common mental health disorder in children and adolescents. Over the last several decades, the rate of children and adolescents using ADHD medication has been increasing in many countries. A recent study found that the prevalence of ADHD medication use among children aged 3-18 years increased in 13 different world regions between 2001 and 2015, where the absolute increase ranged from 0.02 to 0.26% per year. The goal of this study was to examine the use of methylphenidate in Canadian children and its associated adverse reactions. Methylphenidate use information among young Canadians aged 0-14 years was extracted from IQVIA data on prescriptions dispensed by pharmacies between April 2014 and June 2020. The adverse reaction information associated with methylphenidate use was extracted from the Canada Vigilance database for the same time period. Methylphenidate use trends were analyzed based on sex, age group (0-4 years, 5-9 years, and 10-14 years), and geographical location (province). The common classes of adverse reactions associated with methylphenidate use were sorted, and the relative risks associated with methylphenidate use as compared with two second-line amphetamine medications for ADHD were estimated. This study revealed that among Canadians aged 0-14 years, every 100 people used about 25 prescriptions (or 23,000 mg) of methylphenidate per year during the study period, and the use increased with time. Boys used almost three times more methylphenidate than girls. The amount of drug used was inversely associated with age: Canadians aged 10-14 years used nearly three times as many drugs compared to those aged 5-9 years. Seasonal methylphenidate use patterns were apparent among young Canadians, but the seasonal trends differed among the three age groups. Methylphenidate use varied from region to region, and the highest methylphenidate use was observed in Quebec, where the use of methylphenidate was at least double that of any other province. During the study period, Health Canada received 304 adverse reaction reports associated with the use of methylphenidate for Canadians aged 0-14 years. The number of adverse reaction reports received for boys was 3.5 times higher than that for girls. The three most common adverse reaction classes were psychiatric disorders, nervous system disorders and injury, poisoning procedural complications. The number one commonly reported adverse reaction for boys was aggression (11.2%), while for girls, it was a tremor (9.6%). The safety profile in terms of adverse reaction classes associated with methylphenidate use was similar to that of the selected control products. Methylphenidate is a commonly used pharmaceutical product in young Canadians, particularly in the province of Quebec. Boys used approximately three times more of this product as compared to girls. Future investigation is needed to determine what factors are associated with the observed geographic variations in Canada.

Keywords : adverse reaction risk, methylphenidate, prescription trend, use variation
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