



Deviant Patterns of Methylphenidate Use in Adults

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Background

Methylphenidate is used as first-line treatment for attention-deficit/hyperactivity disorder (ADHD). Several studies have documented misuse, either non-medical use or medical misuse, of methylphenidate. Knowledge is scarce on clinical characteristics associated with deviant use of methylphenidate in the general population.

■ The objectives of this cohort study were to identify and characterize individuals with deviant patterns of methylphenidate use and to assess potential predictors associated with deviant use.

Methods

Data on prescriptions were extracted from the Danish National Prescription Registry. We included individuals ≥ 18 years filling their first prescription for methylphenidate during 2007-2012. Individuals were followed for one full year after filling their first prescription for methylphenidate. Deviant patterns of methylphenidate use were defined as using ≥ 4 different prescribers and ≥ 1095

defined daily doses of methylphenidate during follow-up. These threshold values were arbitrarily set and were subject to sensitivity analyses. Users of methylphenidate were characterized according to baseline characteristics and characteristics of use during the first year. Baseline characteristics associated with deviant patterns of methylphenidate use were estimated using logistic regression.

Results

Among 20,829 new users of methylphenidate we identified 82 (0.39 %) individuals displaying deviant patterns of methylphenidate use. Compared to non-deviant users, individuals displaying deviant patterns of use were characterized by higher age, higher use of extended-release methylphenidate, a greater number of dispensings prescribed by general practitioners and hospital doctors and a higher proportion of users with use of drugs related to the nervous system, especially drugs used in addictive disorders and opioids. All of the above mentioned characteristics were significant predictors of deviant use (Table 1). Changing our definition of deviant use markedly changed the number of users displaying deviant patterns of use (Table 2). Compared to the main analysis, sensitivity analyses with more strict criteria identified deviant users that were older, were characterized by a higher proportion of users with use of drugs related to the nervous system and a higher proportion of users initiating instant-release methylphenidate.

TABLE 1: Predictive factors of deviant patterns of methylphenidate use assessed using logistic regression.

| Baseline characteristics | | Multivariate analysis OR [95 % confidence interval] |
|-----------------------------------|-----------------------------------|--|
| Age at first dispensing (years) | 18-24 | (ref.) |
| | 25-49 | 2.49 [1.32 - 4.70] |
| | 50+ | 0.59 [0.16 - 2.19] |
| Formulation of first dispensing | Instant-release methylphenidate | (ref.) |
| | Extended-release methylphenidate | 4.35 [2.78 - 6.82] |
| Type of initial prescriber | Practicing specialist | (ref.) |
| | General practitioner | 3.06 [1.56 - 6.02] |
| | Hospital doctor | 4.07 [2.23 - 7.43] |
| Prior use of drugs in ATC group N | Opioids | 1.75 [1.01 - 3.02] |
| | Drugs used in addictive disorders | 2.08 [1.10 - 3.94] |

TABLE 2: Number of individuals when changing thresholds of doctor-shopping and number of DDDs in the definition of deviant patterns of methylphenidate use.

| | No threshold | ≥ 730 DDD/year | ≥ 1095 DDD/year | ≥ 1416 DDD/year |
|---------------------------|--------------|---------------------|----------------------|----------------------|
| No threshold | 20,829 | 814 | 192 | 61 |
| ≥ 3 prescribers/year | 3716 | 403 | 123 | 48 |
| ≥ 4 prescribers/year | 1372 | 230 | 82 | 35 |
| ≥ 5 prescribers/year | 491 | 105 | 47 | 25 |

Conclusion

Deviant users of methylphenidate were characterized by higher age, higher use of extended-release methylphenidate and a higher proportion of users with use of opioids and drugs used in addictive disorders as compared to non-deviant users. These characteristics were significant predictors of deviant use. Our results were not robust to changes in threshold values. It remains unclear if multiple prescribers and high dispensed quantities can be used to identify users with a medical misuse.

Perspectives

Future studies in the other Nordic countries would add to our understanding of the dynamics of deviant use patterns of methylphenidate. Further, Nordic collaboration could contribute to developing the methodology used to identify medical misusers of prescription drugs in general.