

Papers

Use of lithium and the risk of injurious motor vehicle crash in elderly adults: case-control study nested within a cohort

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Since its introduction in the 1960s lithium has been an effective agent for stabilising mood in the treatment of bipolar disorder. However, its use has been linked to impaired memory and slow reaction times.¹ Car crashes resulting from drug use are becoming a major public health hazard among elderly people.² We assessed the association between elderly people's use of lithium and their involvement in motor vehicle crashes. We also assessed another common mood stabiliser, carbamazepine, which has a different mechanism of action to lithium.

Subjects, methods, and results

We used a case-control approach on data from a cohort that has been described previously.³ Briefly, we used the Universal Quebec Automobile Insurance Agency to identify all 224 734 drivers aged between 67 and 84 years in the province of Quebec at 1 June 1990 and followed them up to 31 May 1993. To be included in the cohort subjects needed to have a valid driver's licence and to have lived in Quebec for at least two years before 1 June 1990. Cohort subjects were followed up until they reached the age of 85 or emigrated from Quebec or until 31 May 1993, whichever was the earliest. We defined the study outcome as subjects' involvement, as drivers, in a motor vehicle crash in which at least one person sustained a physical injury. Cases were subjects who had any such crash during the follow up period, and the date of their first crash was taken as the index date. Controls were a 6% random sample of the cohort, and their index dates were randomly selected during the follow up.

Exclusion criteria were the same as in the previous study.³ We used data from the Quebec Health Insurance Agency to identify subjects' use of prescription drugs and other covariate information. The database on prescription drugs includes information on all outpatient prescriptions of drugs dispensed to people aged 65 years or older. The accuracy and validity of these data have been shown to be high.⁴

We used logistic regression to compute the odds ratio as an estimate of the rate ratio of an injurious motor vehicle crash associated with use of lithium or carbamazepine. We defined exposure to the drugs as any prescription in the year before the index date and current use as a prescription dispensed in the 60 days before the index date. We adjusted for age, sex, place of residence (urban or rural), previous involvement in an injurious motor vehicle crash, chronic disease score, and exposure to central nervous system drugs in the 60 days before the crash.

A total of 5579 people in the cohort had had an injurious motor vehicle crash during the follow up period. A random sample of 13 300 control subjects was drawn from the cohort. Current use of lithium was higher among subjects who had been involved in an injurious motor vehicle crash than among control

subjects (rate ratio 2.08 (95% confidence interval 1.11 to 3.90) (table 1). Current use of carbamazepine was not associated with having had an injurious motor vehicle crash (rate ratio 0.83 (0.48 to 1.44)).

Comment

Elderly people who use lithium may increase by twofold the risk of being involved in an injurious motor vehicle crash while driving. We had no information on diagnoses of bipolar disorder in this group (including severity of disease). Our sample size was too small to allow stratification by number of drugs used. There may, therefore, have been a small possibility in our study of confounding by indication due to disease severity.

A recent retrospective cohort study found lithium to be more efficacious than valproate semisodium (divalproex sodium) in preventing suicides.⁵ That finding may prompt clinicians to favour lithium over other mood stabilising agents. Patients who are prescribed lithium must be told about the increased risk of motor vehicle crashes.

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Rate ratios for having been involved as a driver in an injurious motor vehicle crash (cases), according to drug use

Drug use	No of cases (n=5579)	No of controls (n=13 300)	Rate ratio	
			Crude	Adjusted* (95% CI)
Lithium				
Any use in the year before index date†:	20	27	1.77	1.80 (1.00 to 3.24)
1-4 prescriptions	2	8	0.60	0.71 (0.15 to 3.45)
≥5 prescriptions	18	19	2.26	2.18 (1.14 to 4.19)
Current use (within 60 days before index date†)	19	22	2.06	2.08 (1.11 to 3.90)
Carbamazepine				
Any use in the year before index date†:	36	79	1.09	1.04 (0.70 to 1.54)
1-4 prescriptions	18	41	1.05	1.02 (0.58 to 1.79)
≥5 prescriptions	18	38	1.13	1.05 (0.58 to 1.85)
Current use (within 60 days before index date†)	18	48	0.90	0.83 (0.48 to 1.44)

*Adjusted for age, sex, residence in the country, previous involvement in an injurious motor vehicle crash, chronic disease score, and exposure in the 60 days before the index date to antidepressants, anti-epileptics, benzodiazepines, antipsychotics, antimigraine drugs, muscle relaxants, or narcotic analgesics.
†The date of each driver's first crash in the follow up period (for cases) or a random date (for controls).