**Risk of serious medical events in patients with depression treated with electroconvulsive therapy: a propensity score-matched, retrospective cohort study**

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**Summary**

**Background**

Previous studies examining the risk of medical complications from electroconvulsive therapy have been confounded and this might contribute to its underuse. This study aimed to compare the risk of serious medical events, defined as those resulting in hospitalisation or death, among patients with depression who received electroconvulsive therapy versus patients who did not receive electroconvulsive therapy.

**Methods**

This was a propensity score-matched, retrospective cohort study using linked population-based administrative health data for adults admitted to designated psychiatric facilities in Ontario, Canada, for more than 3 days with depression between April 1, 2007, to Feb 28, 2017. Electroconvulsive therapy exposure was defined as one or more physician billing procedure codes during hospitalisation. The unit of analysis was individual admissions and propensity score matching was used to match each exposed admission to an unexposed admission to estimate the average treatment effect of electroconvulsive therapy among those treated. The primary outcome was serious medical events, a composite of hospitalisation for medical (ie, non-psychiatric) reasons or non-suicide death within 30 days from electroconvulsive therapy exposure or matched date in the unexposed group. Effect modification was examined using tests of interaction for three clinically relevant prespecified subgroups (sex, presence of psychotic symptoms, and illness polarity). Secondary outcomes were medical hospitalisation and non-suicide death separately, suicide death, and specific serious medical events.

**Findings**

In propensity score matched analyses, there were 10 016 psychiatric hospitalisation records (6628 women, 3388 men) with mean age 56·6 years (SD 16·3) and no ethnicity data available. 65 818 admissions were eligible for matching and 5008 were matched (1:1) in each exposure group. In the propensity score matched cohort, the incidence of serious medical events was 0·25 per person-year in the exposed group and 0·33 per person-year in the unexposed group (cause-specific hazard ratio 0·78 [95% CI 0·61–1·00]). Suicide death as a competing risk did not alter this finding. The risk of suicide death was significantly lower in the exposed (≤5 of 5008 admissions) versus the unexposed group (11 [0·2%] of 5008 admissions; p<0·03). Bipolar depression, compared with unipolar depression, was associated with a greater reduction in the risk of serious medical events with electroconvulsive therapy. Electroconvulsive therapy was not associated with medical hospitalisation or non-suicide death separately, nor with any specific serious medical event.

**Interpretation**

Among individuals hospitalised with depression, we found no evidence for a clinically significant increased risk for serious medical events with exposure to electroconvulsive therapy, and the risk of suicide was found to be significantly reduced, suggesting the benefits of electroconvulsive therapy for depression outcomes might outweigh its risks in this population.

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