

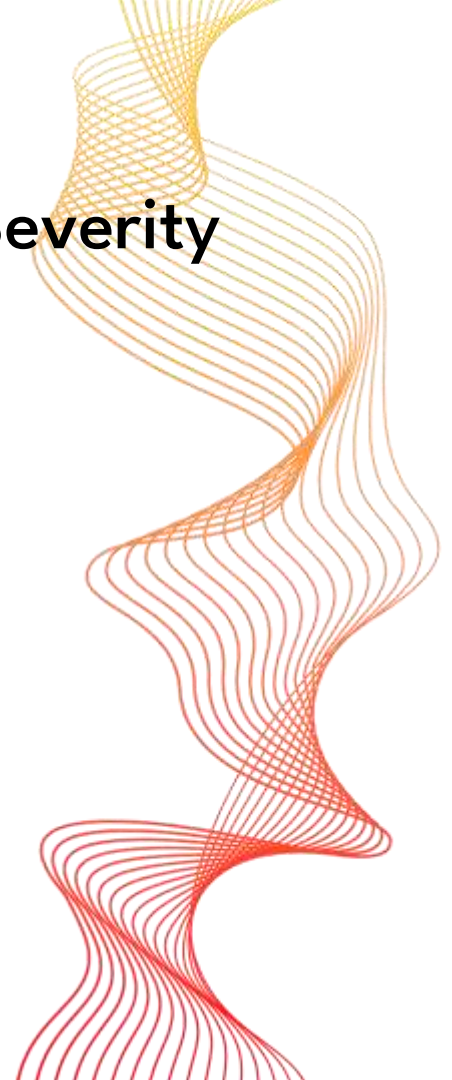


Electroconvulsive Therapy, Depression Severity and Mortality

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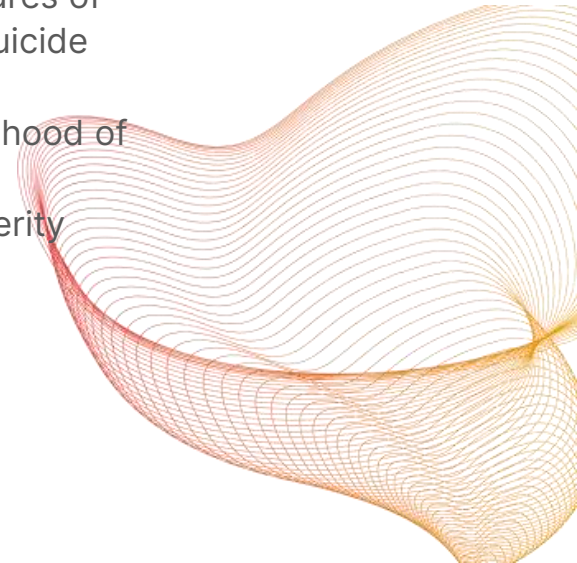
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Introduction

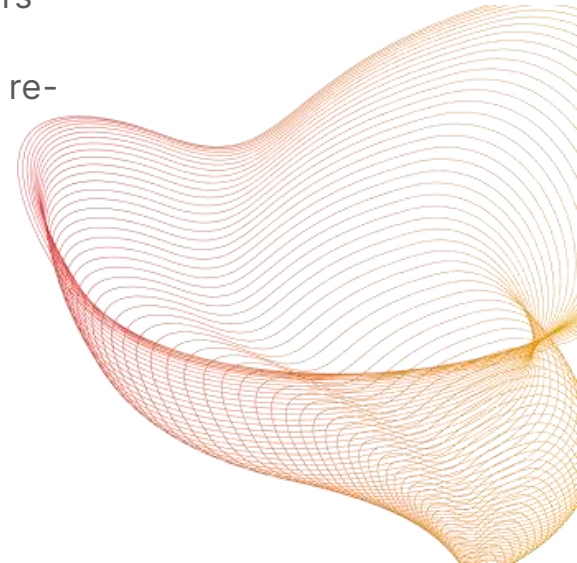
- Electroconvulsive therapy (ECT) is effective for patients with severe or medication-resistant depression, including those with psychotic features.
- Smaller studies estimate remission based on changes in depression scales
- Larger epidemiological studies have limited access to direct measures of response or remission, yet use available proxies such as suicide, suicide attempts, death, or hospital readmission.
- Recent studies have shown that ECT is associated with a low likelihood of immediate or short-term death.
- However, there are no studies examining whether depression severity influences the effect of ECT on health outcomes.





Study Aims

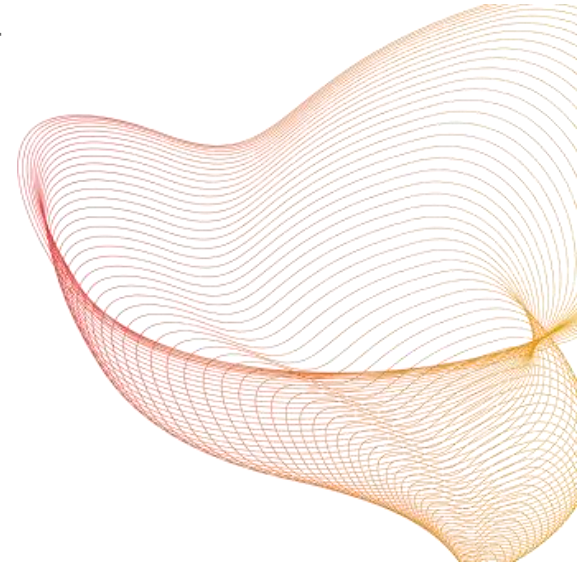
- To examine the importance of depression severity as a predictor of ECT use and on the risk of re-hospitalization, suicidal behavior, and mortality.
- To test the hypothesis that indicators of depression severity would be strong predictors of ECT use, whereas the influence of social factors would attenuate after multiple adjustments.
- To hypothesize that ECT would be associated with higher rates of re-hospitalization, suicidal behavior, and mortality.





Study Population

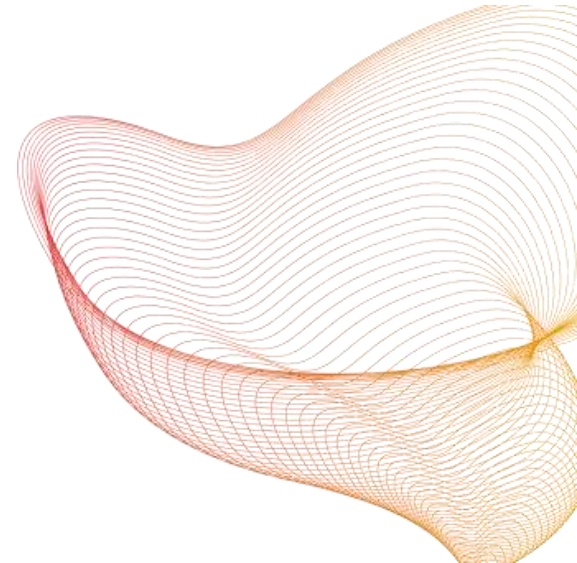
- All citizens in Denmark with a first-time hospital contact due to single episode or recurrent depression between 2005 and 2015 were included.
- Identified through record linkage with the Danish National Patient Registry.
- Excluded patients with prior admission for manic episodes, bipolar disorder, schizophrenia, or chronic, atypical, unspecified affective disorders.





Measures

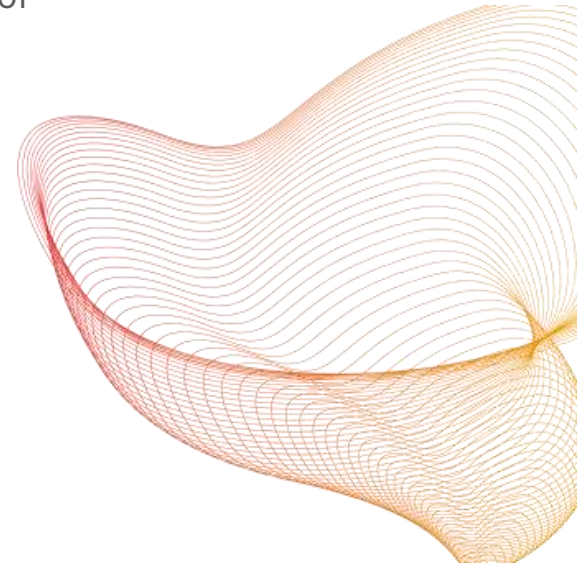
- ECT (electroconvulsive therapy) administered at 21 hospital departments.
- Depression main indication for ECT treatment (75%).
- ECT treatment counted from date of first ECT.





Subsequent Outcomes

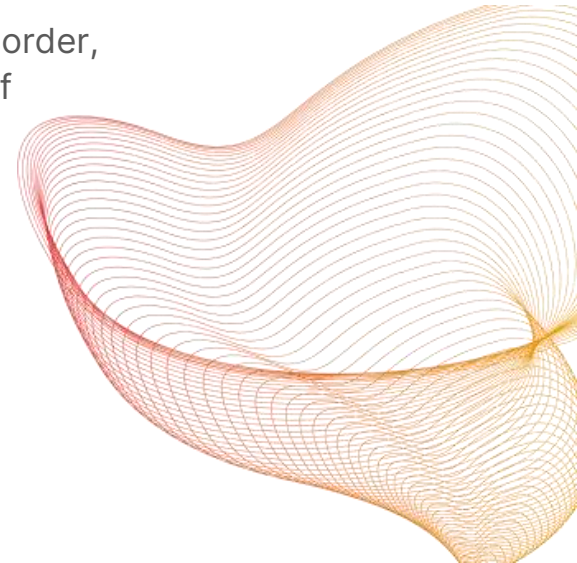
- Re-hospitalization with major depression as main diagnosis as inpatient or emergency ward patient.
- Suicide attempts, suicide, and all-cause mortality.
- Information obtained from the DNPR (hospitalization) and Causes of Death Registry (mortality).





Depression Severity, Sociodemographic, and Clinical Covariates

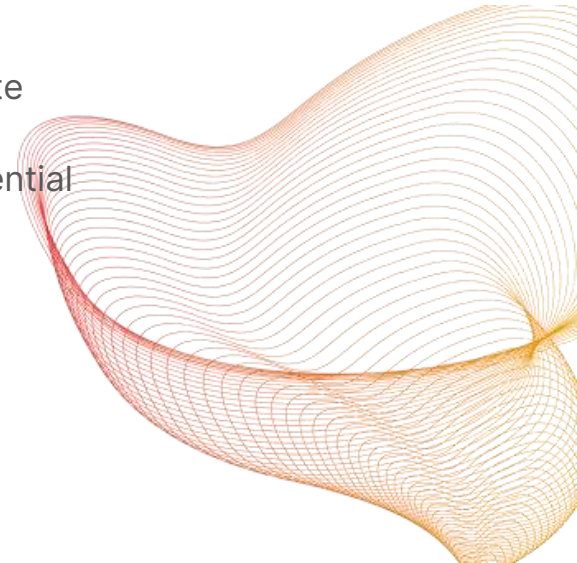
- Depression severity categorized as mild, moderate, or severe with or without psychotic features.
- Sociodemographic variables included sex, age, level of education, and marital status.
- Clinical variables included comorbid alcohol abuse, personality disorder, history of stroke and attempted suicide, medication, and number of hospitalizations.





Cox Proportional Hazard Regression Models

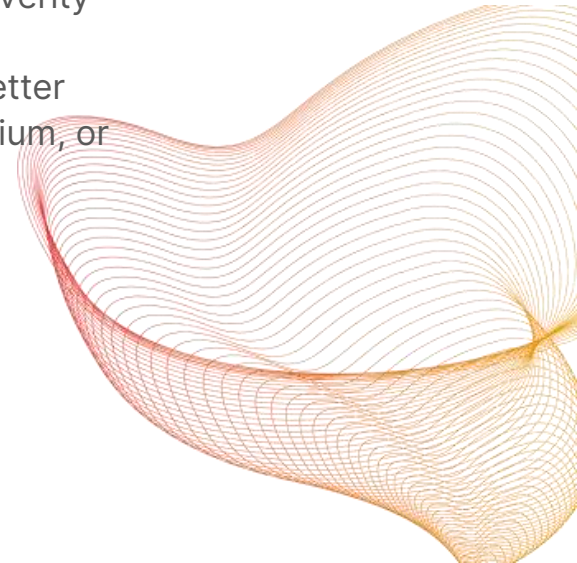
- Used to examine the associations of depression severity, sociodemographic, and clinical variables with first-time ECT treatment.
- Patients were followed until date of first ECT, emigration, death, or end of follow-up, whichever came first.
- Also used Cox proportional hazard regression models to study the associations between first ECT and each study outcome in separate models.
- ECT was entered as time-dependent variables to account for potential immortal time bias.





Results for ECT and Depression Severity

- Of 92,895 patients, 5.4% were treated with ECT and the median number of sessions was 10.
- ECT initiated much earlier in patients with severe depression.
- Predictors of ECT use were relatively similar across depression severity categories.
- Patients treated with ECT were more often older than 70 years, better educated, married, and were taking medication for depression, lithium, or anxiety/insomnia.



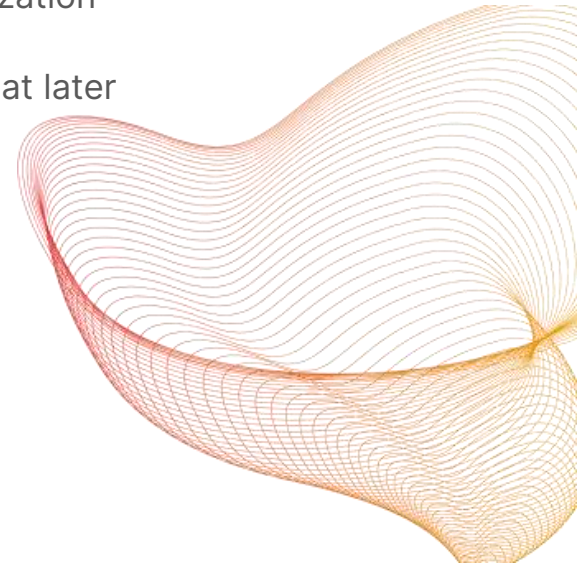


	Total number	Number treated with ECT. n (%)	Crude hazard ratio (95% CI)	Mutually adjusted Hazard ratios (95% CI)
Age at baseline (years)				
10–29	29,504	561 (1.9)	1	1
30–49	31,833	1605 (5.0)	2.66 (2.43–2.95)	1.76 (1.68–1.97)
50–69	18,321	1719 (9.4)	5.25 (4.77–5.78)	3.03 (2.79–3.42)
70–101	13,237	1119 (8.5)	5.15 (4.66–5.71)	4.71 (4.13–5.57)
Educational status				
Basic	38,792	1633 (4.2)	1	1
Middle	34,321	2113 (6.2)	1.47 (1.38–1.57)	1.30 (1.22–1.39)
High	13,342	1027 (7.7)	1.86 (1.72–2.01)	1.36 (1.27–1.48)
Unknown	6440	231 (3.4)	0.87 (0.76–1.00)	0.77 (0.65–0.90)
Marital status				
Married	31,818	2585 (8.1)	1	1
Unmarried	41,943	1280 (3.1)	0.36 (0.34–0.38)	0.83 (0.77–0.90)
Divorced	11,004	562 (5.1)	0.62 (0.56–0.68)	0.68 (0.62–0.74)
Widowed	7462	529 (7.1)	0.94 (0.85–1.03)	0.82 (0.74–0.91)



ECT and Re-hospitalization, Suicidal Behavior, and Mortality

- During follow-up, 31.7% of patients were readmitted as inpatients, 11.1% had at least one emergency ward contact, 0.6% committed suicide, and 4.2% attempted suicide.
- ECT was associated with a higher age-adjusted risk of re-hospitalization and suicidal behavior but a lower risk of all-cause mortality.
- The risk of re-hospitalization was higher during the first year than at later follow-up.





Impact of Depression Severity on ECT

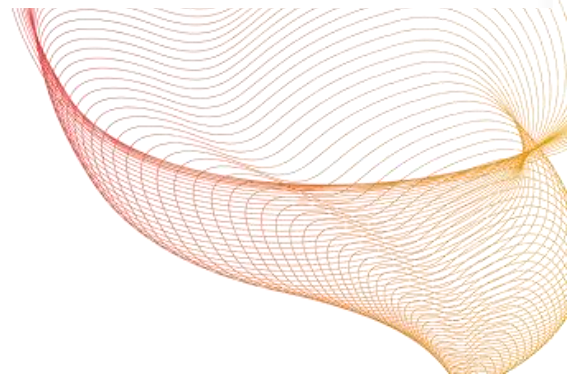
- The HRs for re-hospitalization and all-cause mortality were similar across the four categories of depression severity.
- The risk of emergency contact or suicidal behavior in patients treated with ECT seemed to decrease with depression severity.
- The adjusted hazard ratio for the association between ECT and suicide in patients with mild depression was higher compared to those with severe depression with psychotic symptoms.





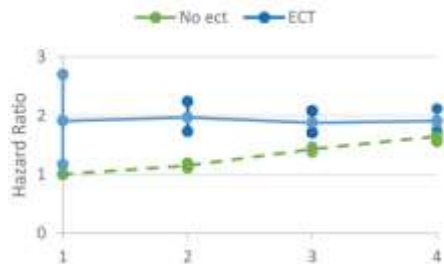
Outcome/exposure	Mild	Moderate	Severe without psychotic features	Severe with psychotic features
In patient re-hospitalization/ ECT vs no ECT	1.63 (1.17-2.34)	1.63 (1.44-1.86)	1.54 (1.39-1.74)	1.46 (1.29-1.65)
Re-admission at emergency clinic/ ECT vs no ECT	3.43 (2.45-2.79)	2.48 (2.12-2.90)	2.27 (1.97-2.61)	1.81 (1.47-2.23)
Suicide attempts/ ECT vs no ECT	2.69 (1.65-4.50)	2.42 (1.95-3.00)	2.06 (1.65-2.56)	1.40 (0.99-1.99)
Suicide/ ECT vs no ECT	6.99 (3.30-14.43)	3.37 (2.31-4.91)	2.84 (1.95-4.15)	1.10 (0.55-2.20)
All-cause mortality/ ECT vs no ECT	0.92 (0.71-1.14)	0.83 (0.73-0.95)	0.96 (0.85-1.09)	0.70 (0.58-0.82)

⊛ Adjusted for age, gender, education, marital status, patient type, comorbid alcohol abuse, personality disorder, previous stroke, drugs for depression, psychosis, anxiety, insomnia and relapse prevention.

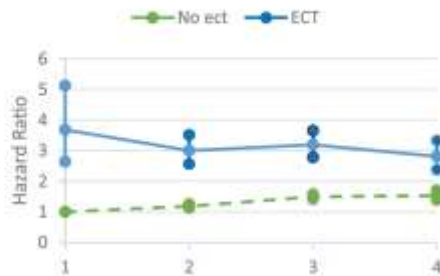




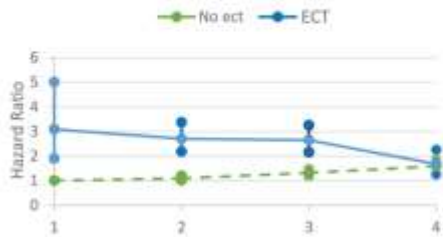
a. ECT and re-hospitalization



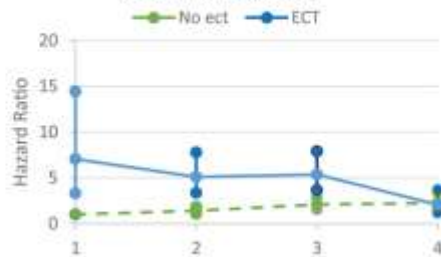
b. ECT and emergency contact



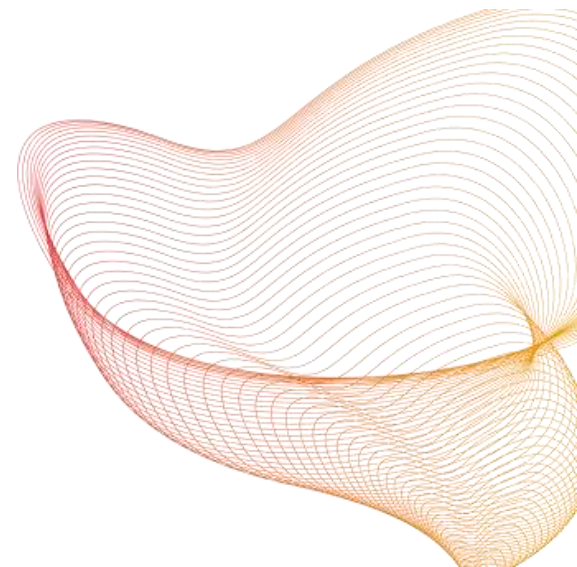
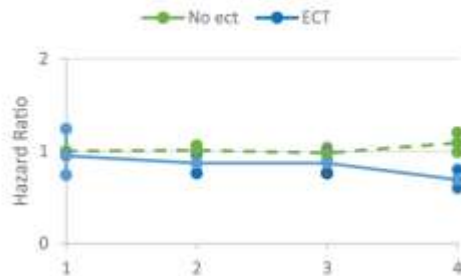
c. ECT and suicide attempt



d. ECT and suicide



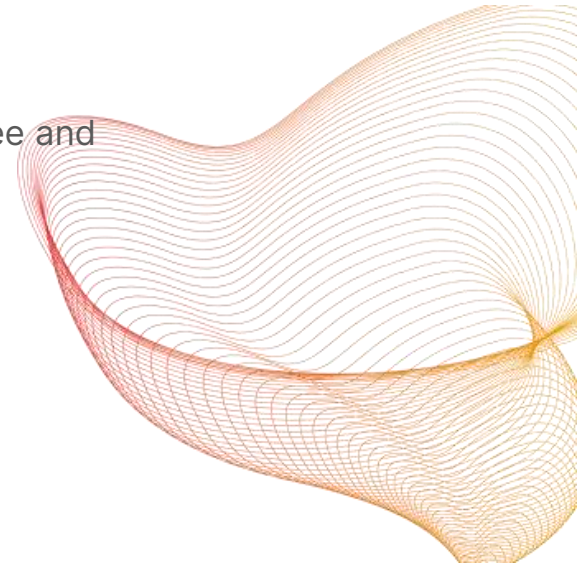
e. ECT and all-cause mortality





Discussion: Demographic Factors Associated with ECT Use

- ECT is used most often in patients with more severe depression, as recommended by guidelines.
- Patients with lower education or unmarried status were less likely to receive ECT independent of depression severity, contrary to the hypothesis.
- This inequality in prescription by socioeconomic status has been described in the US, but is surprising in Denmark where there is free and equal access to treatment.





Outcomes Associated with ECT Use

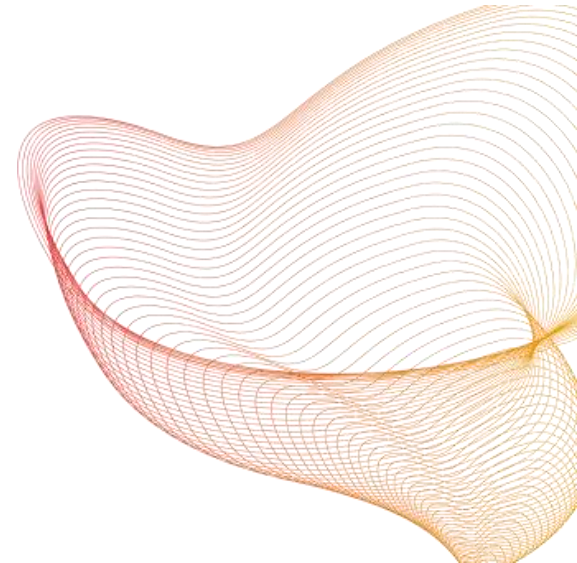
- ECT is associated with higher rates of re-hospitalization and suicidal behavior, even after adjustment for a number of determinants.
- However, the relative risk varied with depression severity, with the lowest hazard ratio among patients with the most severe depression.
- The study found that ECT use is associated with decreased all-cause mortality, especially in the most severely depressed patients.





Strengths and limitations

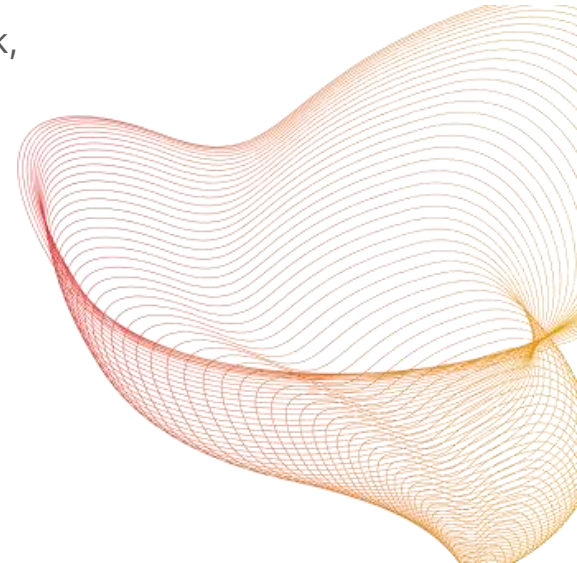
- Register-based cohort study of patients with a first-time hospital contact diagnosis of single or recurrent depression.
- Use of nation-wide population-based registers in Denmark.
- Complete data on ECT, hospital admissions, and death.
- Data on the effectiveness of treatments in terms of intermediate outcomes not available





Factors Associated with ECT Prescription

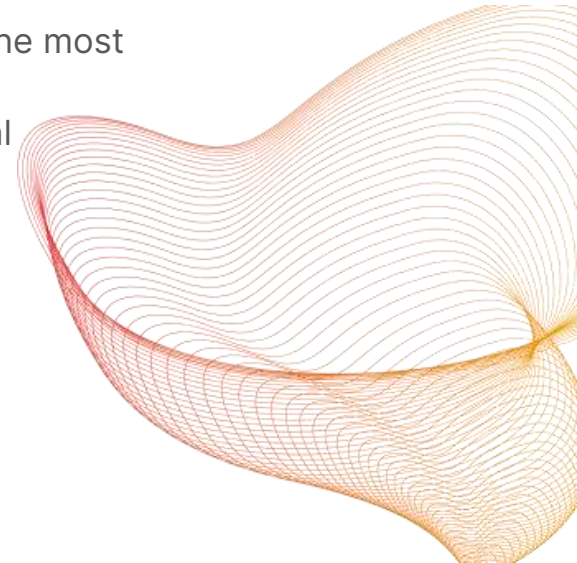
- ECT was used most often in patients with more severe depression and in the elderly.
- Patients with lower education or unmarried status were less likely to receive ECT.
- Inequality in ECT prescription by socioeconomic status in Denmark, despite free and equal access to all treatment.





Effectiveness and Risks of ECT

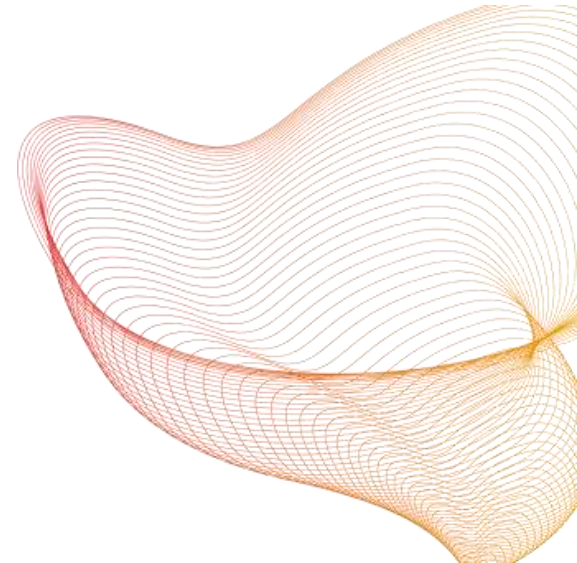
- ECT associated with higher rates of re-hospitalization and suicidal behaviour.
- Relative risk varied with depression severity, with the lowest risk among patients with the most severe depression.
- ECT associated with decreased all-cause mortality, especially in the most severely depressed patients.
- ECT prescription is influenced by factors such as education, marital status, and physician conceptualization of the patient's condition.





References

Jørgensen MB, Rosing MP, Kellner CH, Osler M. Electroconvulsive therapy, depression severity and mortality: Data from the Danish National Patient Registry. *J Psychopharmacol.* 2020 Mar;34(3):273-279.





Thank you for your time 😊