Project Title

Use of Electroconvulsive Therapy in Adolescents in Singapore

Project Lead and Members

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Organisation(s) Involved

Institute of Mental Health

Healthcare Family Group(s) Involved in this Project

Allied Health, Ancillary Care

Applicable Specialty or Discipline

Psychology, Mental Health, Psychiatry

Project Period

Start date: Mar 2017

Completed date: Mar 2023

Aims

- Our study sought to determine the use of ECT in adolescents in a tertiary psychiatric institution in Singapore.
- We aimed in describe the indications for ECT in adolescents and to compare the symptomatic, cognitive, quality of life response and objective functioning outcomes of patients who received ECT treatment.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

Singapore Health & Biomedical Congress (SHBC) 2023: Best Poster Award (Nursing) – (Silver Award)

Project Category

Applied/ Translational Research

Quantitative Research

Keywords

Schizophrenia, Adolescent, Psychiatry, Depression, Catatonia, ECT

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Use of Electroconvulsive Therapy in Adolescents in Singapore

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Background

- Electroconvulsive therapy (ECT) is a well-established and highly effective treatment for schizophrenia and mood disorders, however, most of the evidence is derived from adult population with less evidence in adolescents.
- ECT is infrequently administered in adolescents due to lack of high-quality scientific evidence supporting its effectiveness, and fear about the treatment potential effects on the developing brain.[1]
- American Academy of Child and Adolescent Psychiatry (AACAP) in 2004 outlined the indications to treat adolescent with ECT include:
  1. a diagnosis of severe major depressive disorder, mania, schizoaffective disorder, schizophrenia, catatonia, or neuroleptic malignant syndrome,
  2. symptoms must be severe, persistent and disabling, including life-threatening symptoms such as a refusal to eat or drink, severe suicidality, or uncontrollable mania or forbid psychosis,
  3. lack of response to two different treatment trials.[2]

Aims

- Our study sought to determine the use of ECT in adolescents in a tertiary psychiatric institution in Singapore.
- We aimed to describe the indications for ECT in adolescents and to compare the symptomatic, cognitive, quality of life response and objective functioning outcomes of patients who received ECT treatment.

Methods

- We conducted a retrospective naturalistic analysis of the data collected through the Clinical Alliance and Research in Electroconvulsive Therapy (CARE) Network[3] on patients aged 12 to 19 years from March 2017 to March 2023.
- Descriptive analysis was used to analyze the demographics and clinical characteristics.
- Independent T-tests were used to compare baseline and post 6 ECT clinical assessment scores:
  1. Symptom assessment
     - Brief Psychiatric Rating Scale (BPRS)[4]
     - Montgomery–Åsberg Depression Rating Scale (MADRS)[5]
     - Clinical Global Impressions Scale –Severity (CGI-S) and Improvement (CGI-I)[6]
     - Global Assessment of Functioning (GAF)[7]
  2. Cognitive assessment: Montreal Cognitive Assessment (MoCA)[8]
  3. Quality of life assessment
     - EQ-5D-3L[9]
     - Quality of Life Enjoyment and Satisfaction Questionnaire Short Form[10]
- Statistical significance was set at $p < 0.05$.

Results

Interrater reliability

Calculated using Intraclass correlation, as defined by (MSrater − MSerror)/[MSrater + (average number of patients per rater − 1)*MSerror], was >0.8 for BPRS & MADRS between the raters, where MS indicates mean square.

ECT Characteristics

- A total of 55 patients aged 17.4±1.4 (mean ± SD) were included for analysis.
- The most common diagnosis for ECT was schizophrenia followed by mania and depression (refer Figure 1).
- The most common reasons for ECT referral is failure of medication after average of 2-3 months inpatient treatment, followed by poor oral intake and severe aggression/agitation (refer Figure 2).
- Individualized ECT treatment is calibrated base on patient's individual clinical characteristics.
- Patients with positive psychotic symptoms were most likely to receive bifrontal (BF) ECT, whereas mania and depression were mostly likely to receive ultrabrief right unilateral (RUL) ECT. In catatonia, bitemporal (BT) ECT was the dominant ECT modality.
- The average number of ECT sessions was 10.98 ±4.19 (mean ± SD) for each course of ECT treatment, with minimum of 2 sessions of ECT to maximum of 16 sessions.
- Propofol (1mg/kg) and succinylcholine (0.5mg/kg) were used for anaesthesia and muscle relaxation respectively.

Results (cont'd)

Clinical outcomes

There was a significant improvement of their clinical symptoms after 2 weeks of ECT treatment (6 sessions). 52.9% of patients showed significant improvement and responded to treatment (defined as a ≥ 40% improvement in BPRS psychotic subscales for schizophrenia, ≥ 50% improvement of total BPRS scores for mania and catatonia, ≥ 50% improvement of total MADRS scores for depression). There was no significant change in MoCA total score and subscale delayed recall score. (refer Table 1)

Table 1: ECT associated change of clinical assessment score after treatment

		Baseline		Post ECT		p-value
Scales	**N**	**Mean**	**SD**	**Mean**	**SD**	
BPRS	24	62.7	16.7	41.2	11.2	**<0.001**
MADRS	8	30.1	6.5	16.1	12.7	**<0.005**
CGIS	42	5.5	0.8	3.8	1.1	**<0.001**
Q-LES-SF overall	26	3.0	1.6	3.6	1.3	0.064
MOCA	24	21.7	7.6	23.8	3.2	0.160
Delayed Recall	23	3.0	2.1	2.3	1.6	0.167
GAF	44	29.6	9.3	48.7	14.1	**<0.001**
EQ VAS	27	63.4	32.9	71.7	30.8	0.269
CGII	42	NA	NA	2.3	0.8	NA
Response rate	33	NA	NA	52.9%	NA	NA

Abbreviations: SD, standard deviation; BPRS, Brief Psychiatric Rating Scale; MADRS, Montgomery–Åsberg Depression Rating Scale; CGIS, Clinical Global Impressions Scale –Severity; Q-LES-SF, Quality of Life Enjoyment and Satisfaction Questionnaire - Short Form; MoCA, Montreal Cognitive Assessment; GAF, Global Assessment of Functioning; VAS, EuroQol Visual Analog Scale

Discussion and Conclusion

Our study was a naturalistic and observational study of pragmatic ECT treatment in a large tertiary psychiatric hospital and may be novel in that it is the first study describes the use of ECT in adolescents. Our preliminary findings show that ECT is safe, rapid & effective treatment for psychotic and mood disorders in adolescents.

ECT treatment to adolescents in IMH is consistent with the recommendation from various clinical guidelines. The average mean baseline BPRS score of 62.7 was much higher than adult populations who received the same treatment and slightly lower response rate. While Adolescents treated with ECT for depression with average MADRS score of 30.1 were slightly less severe as compared to adults. Our study found a similar response rate among patients with schizophrenia, but a lower response rate for mood disorders as compared to international findings.

Limitations

- Small number of subjects who received ECT during the study period.
- Data were extracted from database and complete clinical assessment data were not available for the entire sample.
- The beginning ECT charge (seizure threshold) and end ECT charge (treatment dose) in millicoulombs were not available.
- The assessments were conducted by unblinded assessors with no placebo (sham) or control groups.

Recommendations

ECT should be considered for adolescents with schizophrenia who failed medication trials as it is an effective and safe treatment; while ECT for young patients with depression should be carefully considered in view of low response rate in this special population.

Figure 1. Diagnosis for ECT

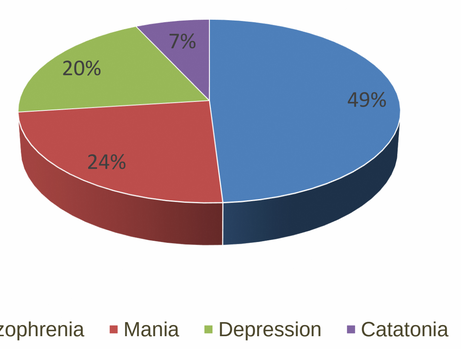
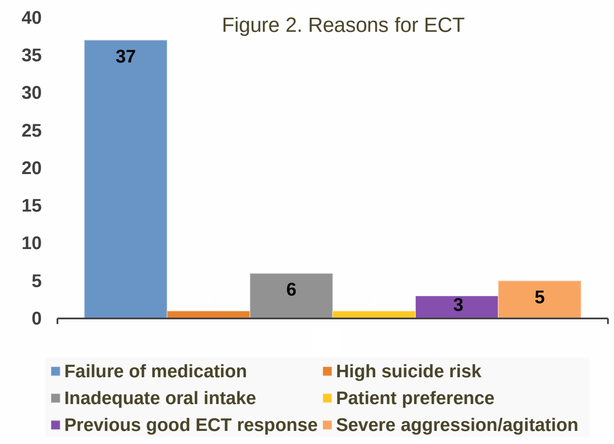


Figure 2. Reasons for ECT



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