The Use of Electroconvulsive Therapy in the treatment of psychiatric conditions at Valkenberg Psychiatric Hospital in Cape Town.
A Retrospective Audit.

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Submitted in partial fulfillment of the requirements for the degree of MMed in Psychiatry at the University of Cape Town.

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Declaration:

I, Keagan Walter Clay, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Date: 3/10/2022

Abstract: Prepared for submission to the South African Journal of Psychiatry (SAJP)

The Use of Electroconvulsive Therapy in the treatment of psychiatric conditions at Valkenberg Psychiatric Hospital in Cape Town. A retrospective audit.

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Background: Mental disorders are amongst the most prevalent and pervasive group of disorders worldwide.

In South Africa the treatment for mental disorders utilizes a biopsychosocial approach. A small proportion of patients may require ECT. In South Africa the use of ECT is sparse with great heterogeneity regarding indications and practice. More research within the South African context would aid policy planners and managerial stakeholders to set protocols and standards for national and provincial guidelines and standard operating procedures for quality assurance in research and practice. The aim of the study was to perform a clinical audit of the ECT service at Valkenberg Hospital by investigating the prevalence, demographics, diagnoses, indications and outcomes of patient's medical folders receiving ECT.

Methods: This study utilized a retrospective cohort quantitative design; and was completed by examining the folders and ECT records of all patients who received ECT at the Valkenberg Psychiatric Hospital ECT Lab from January 2015 to January 2020. Patient data was collected and exported to an Excel spreadsheet and statistical analysis was completed looking at defined data criteria.

Results: A total of 22 patients received ECT at Valkenberg Psychiatric Hospital between January 2015 to January 2020. Half the patients were 35 years of age or younger. Just over half (n = 12; 54.5%) were male. Most patients (63.6%) were on the Schizophrenia spectrum. The main indication for ECT was catatonia (n =

12; 55%), followed by bipolar depression (n = 4; 18%). The least common indications for ECT were bipolar mania and schizophrenia (n = 1; 4%). Patients had an average of 9 ECT sessions. 81% of patients had adequate short-term response to the treatment. 72.7% had adequate long-term treatment response. The majority of patients (81.8%) had no complications from treatment.

Conclusion: ECT sessions had low complication rates and high rates of adequate short-term outcomes. In this setting ECT was primarily used in treatment resistant patients. ECT is being underutilized as a treatment option despite its low complication rate and effectiveness.

Key Words. ECT (Electro-convulsive therapy); Valkenberg Psychiatric Hospital; Schizophrenia Spectrum Disorders; Treatment Resistance.

List of Abbreviations:

ECT	Electro-Convulsive Therapy
SASH	South African Stress and Health Study
VBH	Valkenberg Psychiatric Hospital
DSM-5	Diagnostic and Statistical Manual of Mental Disorders
ICD -10	International Classification of Diseases
WHO	World Health Organization
HREC	Human Research Ethics Committee
UK	United Kingdom

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Chapter One

Background and Significance

Mental disorders are amongst the most prevalent and pervasive group of disorders worldwide. According to the World Health Organization (WHO), the lifetime risk of being affected by mental illness could be as high as 36% across all population groups (1). According to the South African Stress and Health Study (SASH) of 2009, a large-scale population-based study of common mental disorders; the lifetime prevalence of any disorder was 30.3%. The most prevalent 12-month disorders were anxiety disorders (8.1%) followed by substance use disorders (5.8%) then mood disorders (4.5%). The most common being major depressive disorder (4.9%), agoraphobia without panic (4.8%) and alcohol abuse (4.5%) (2).

Serious Mental Illnesses versus Treatment Resistant Disorders:

Severe disorders or serious mental illnesses (SMI) are defined as illnesses that require ongoing care, treatment, and rehabilitation and even periods of hospitalization for the patient to live with the minimum level of disability (3). They result in serious functional impairment and significantly limit major life activities. SMI include disorders such as Schizophrenia, Schizoaffective Disorder, Major Depressive Disorder and Bipolar Mood Disorder (4). In the South African Stress and Health Study 26% of the 12-month prevalent cases were classified as severe and that over 30% of individuals with major depressive episode had a severe disorder.

Serious mental illnesses should be differentiated from treatment resistance, which is defined by an inadequate response to at least two adequate psychopharmacological agents at an appropriate dose and lasting for at least six weeks (5).

In South Africa the treatment for any mental disorder would take the form of a biopsychosocial approach. The legacy of apartheid as well as constrains in funding have resulted in a focused primary health approach to health care (6). Most mental disorders are treated at this primary health care level with fewer patients being admitted to a tertiary care institute. Thus, in this pyramidal approach to health care, usually the patients with the most severe disease are being admitted to longer stay mental health facilities for further care and even fewer of those patients being deemed treatment resistant, requiring more complex treatment regimens such as Electroconvulsive Therapy (ECT) (7).

ECT in Current Practice:

ECT is a widely used treatment of mental disorders and involves the use of an electrical current to depolarize cerebral neurons to induce a generalized seizure via the application of electrodes to the scalp. Modified ECT, as is used in most modern settings, makes use of anesthetic techniques such as the administration of muscle relaxants, and hypnotic agents combined with electroencephalogram monitoring. The main indications for ECT are major depression (unipolar and bipolar), mania, schizophrenia and catatonia. Specifically it is used in catatonia with refusal to eat and drink and if a rapid response is required. It is also utilized for self-harming and suicidal behaviors across the spectrum of mental illnesses.
ECT is often reserved for treatment resistant patients with refractory symptoms or for whom other modalities are not an option, however its use may extend to broader clinical uses as a primary treatment modality depending on the country

and institution (8). In 2001 the American Psychiatric Association advised that the indications for ECT be widened in clinical use (9).

Worldwide about 1 million patients receive ECT every year (10), becoming more widely available on all continents every year with a wide variety of clinical practice between regions (11). The use of ECT remains rare as a specialist treatment for mental illness with much heterogeneity across regions and countries regarding its procedures and practices (12). General Worldwide trends were that only some institutions within a country offered ECT, the training was inadequate, guidelines not being followed and that there was a paucity of knowledge being shared (13).

ECT is postulated to cause multidimensional neuro-physiological changes to the brain. The three primary domains affected include: neurotropic effects, dopamine and serotonin neurotransmitter activity and immune system modulation (14). The exact underpinnings to these mechanisms remain unclear and more research is needed in this area.

Within South Africa, ECT is primarily reserved for the treatment of refractory and life-threatening schizophrenia and unipolar/bipolar depression, and catatonia due to multiple aetiologies. The use of ECT is sparse and used with great heterogeneity regarding indications and practice (15).

More research within the South African context would aid policy planners and managerial stakeholders to set protocols and standards for national and provincial guidelines and standard operating procedures for quality assurance in research and practice.

Literature Review

There is a paucity of ECT research completed in Africa with much heterogeneity in practice across institutions (16). Confusion over protocols, lack of appropriate apparatus and training as well a generalized stigma all hinder the advancement of this treatment modality within the continent.

ECT Practices Worldwide:

According to the National Institute for Health and Care Excellence (N.I.C.E), in England and Wales, within the period of January to March of 1999, 2800 patients received ECT within 16500 ECT sessions. Of these, 68% were female. Once again, a broad range of usage and indications was noted (17).

Read et al conducted an audit of the ECT usage in England between 2011-2015 and found that of the 55 trusts that were looked at, only 32 provided usable data. Alarmingly, 44% of ECT treatments were performed without adhering to known methods of efficacy and 39% of ECT treatments were done without consent. 66% of the patients were women and 56% of those women were over the age of 60 (18). It was noted that adverse events were being under reported and only 4 of the trusts provided data regarding positive outcomes of adverse events.

A large meta-analysis completed in 2012 explored worldwide utilization of ECT, it was noted that two continents, South America and Africa, have a paucity of ECT data. This study only included a single South African study, completed by Mugisha and Ovuga in 1991 (19). Mugisha and Ovuga performed a retrospective study on a population of in patients receiving ECT in combination with pharmacotherapy at Umzimkulu Hospital in Kwazulu-Natal between 1976 and

1982 using length of stay as the criterion variable. They found that the typical length of stay for patients receiving ECT was longer. That study suggested that the use of ECT was a reflection of illness severity. They also noted a sharp decline in the use of ECT from 32% of patients in 1976 to 6% in 1982.

In another meta-analysis done on the prevalence of ECT use worldwide, published by Lesage et al, the total prevalence for the 12 countries involved including 1,253,399,220 inhabitants indicated generally that its use was rare at best with a composite event rate of 17 people treated with ECT per 100,000 inhabitants (20).

It was opted that lower income countries, like Thailand, produced lower prevalence rates, mostly attributed to low funding. It must be noted that a meta-analysis on ECT will always be problematic due to the inherent heterogeneity of its use. The rarity of ECT as a treatment modality was mostly attributed due to its niche indication for use in refractory mental illnesses. The composite event rate of 17 per 100,000 was compared to the much higher incidences of depression (5000 per 100,000) and schizophrenia (400 per 100,000) (20). It is important to note that the studies included in this meta-analysis were mostly from high-income countries such as countries in North America and Europe.

ECT Practice In South Africa:

A survey of the practice of ECT in South Africa was performed between 2011-2012. In this study it was discovered that ECT was available in 6 out of 9 provinces and that of the 42 institutions that had an ECT machine on site, only 29 were active. Depression was found to be the most common indication for ECT with most patients falling between 18 – 59 years old. Other data that emerged from this study were that there number of ECT procedures performed per 10000 persons per year was 1.19 and the number of persons treated with ECT per 10000 persons per year was 0.22 (15).

Stigma:

Stigma and misconceptions toward ECT are still prevalent. In a study performed amongst Stellenbosch second year medical students in 2015, Mausling et al sought to gain insight into the knowledge and attitudes that these students shared around ECT. It was discovered that the main sources of knowledge of ECT were the internet (46.6%) and T.V and/or movies (30.5%). 48.9% of students thought that ECT should be used as a last resort, 44.3% would not recommend ECT to their patients, 40.5% would not be comfortable performing ECT even with adequate training. Only 51.9% of students agreed that ECT should be legal to perform. Overall, statistically, low mean ECT knowledge score was associated with poorer attitudes toward ECT (21).

The general lack of data in Africa does hinder the strength of these figures, highlighting once again the necessity for more work to be done here within our own backyard. More research in South Africa regarding ECT use and prevalence regarding adverse outcomes is certainly needed.

Aim

To investigate the prevalence, demographics, diagnoses, indications and outcomes for patients receiving ECT at Valkenberg Hospital.

Objectives

To perform a clinical audit of the ECT service at Valkenberg Hospital by investigating the prevalence, demographics, diagnoses, indications and outcomes of patient's medical folders receiving ECT.

Chapter Two:

Introduction

Mental disorders are amongst the most prevalent and pervasive group of disorders worldwide. According to the World Health Organization (WHO), the lifetime risk of being affected by mental illness could be as high as 36% across all population groups (22).

Severe disorders or serious mental illnesses (SMI) are defined as illnesses that require ongoing care, treatment and rehabilitation and even periods of hospitalization for the patient to live with the minimum level of disability (3). They result in serious functional impairment and significantly limit major life activities. SMI include disorders such as Schizophrenia, Schizoaffective Disorder, Major Depressive Disorder and Bipolar Mood Disorder (4).

In South Africa the treatment for any mental disorder would take the form of a biopsychosocial approach. The legacy of apartheid as well as constrains in funding have resulted in a focused primary health approach to health care (23). Most mental disorders are treated at this primary health care level with fewer patients being admitted to a tertiary care institute. Thus, in this pyramidal approach to health care, usually the patients with the most severe disease are being admitted to longer stay mental health facilities for further care and even fewer of those patients being deemed treatment resistant, requiring more complex treatment regimens such as Electroconvulsive Therapy (ECT) (7).

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More research within the South African context would aid policy planners and managerial stakeholders to set protocols and standards for national and provincial guidelines and standard operating procedures for quality assurance in research and practice.

Materials and Methods

Study Setting:

This study was performed through the University of Cape Town and examined patient folders at Valkenberg Psychiatric Hospital located in Observatory, Cape Town.

Valkenberg Psychiatric Hospital is one of three tertiary government funded psychiatric hospitals operating within the greater Cape Town area. It provides in-patient and outpatient acute services, medium and long-term services, forensic psychiatric services, therapeutic services and other specialized psychiatric services such as ECT. This institution has a catchment population of well over 1 million people between the ages of 18-59 (24).

Research Design:

This study utilized a retrospective cohort quantitative study design examining the folders of all patients who received ECT at the Valkenberg Psychiatric Hospital ECT Lab from the 31st of January 2015 to the 30th of January 2020.

Sampling:

The records of study participants was obtained from patient case files and the ECT service file which includes standardized record keeping-sheets at Valkenberg Psychiatric Hospital and included a review of sensitive patient details including demographic data, diagnoses, treatments and outcomes. Records include a Mental Health Care Act treatment register, anaesthetic record as well as a patient consent booklet.

Inclusion and exclusion criteria applied to selecting which folders and ECT records where included in this study. All folders and ECT records of all male and female patients from the ages of 18-59 years old who received ECT treatment at Valkenberg Hospital where included in this study. The participants included in-patients and outpatients, as well as both voluntary and involuntary Mental Health Care Act users. This included patients folders and records coming from Lentegeur Hospital, George Hospital and Alexander Hospital who may have come to VBH for day treatment and then return back to their base hospitals.
Exclusion Criteria were all folders and ECT records that did not meet the inclusion criteria.

Data Collection:

This study takes the form of a folder review of the ECT service file and patient files at the Valkenberg Hospital ECT Lab. Patient data was collected and exported to an Excel spreadsheet and statistical analysis was done looking at defined data criteria. Data criteria include patient factors and ECT factors.

Patient factors included the demographic details, diagnosis (primary and secondary), previous treatments (psychopharmacological, psychotherapeutic, electroconvulsive and socio-occupational) and number of admissions.

ECT factors included indication for ECT, number of sessions, doses and type of anesthetic agents used, possible side effects and treatment response - both short term (less than 6 weeks) and long term (more than 6 weeks).

Treatment response was measured by length of seizure as well as clinical outcome and was denoted as being adequate, inadequate or poor. Clinical outcome was measured by overall clinical response and improvement in symptomatology as documented in the patient files as well as the ECT service file. Length of seizure was documented and denoted as either being missed, short (5-10 seconds), adequate (> 15 seconds), prolonged (> 90 seconds) or delayed (25).

Statistical Analysis:

Once data collection had been completed, the data was saved to a password protected device and it was transferred onto an excel spreadsheet. Analysis was performed using SPSS Version 25. To describe the psychosocial demographics of patient folders reviewed, descriptive statistics were generated for all variables. Categorical variables were expressed as percentages. Continuous variables were expressed as standard deviations or quartiles. No interferential statistical analyses where performed.

Ethical Considerations and Approval:

Ethical approval was obtained from The Human Research and Ethics Committee at UCT and Valkenberg Hospital. Reference number: 083/2022.

Confidentiality:
This study is a retrospective patient chart and database review. We requested a waiver of consent as this retrospective folder review posed minimum risk to patients.

Data Management:
All data taken from patient charts and databases was de-identified and allocated a unique number prior to entry into the study database and Excel Spreadsheet.

Confidential health information was and shall not be re-used nor disclosed in any way. The results were and shall not be shared with any of the participants within the study.

The researchers acted in accordance with HREC regulations. T=data was stored on a secure electronic database located on a password-protected device and only the lead investigator (Dr. KW Clay) and the research assistant had access to the data.

This paper takes the form of an MMED dissertation and will be published in a local journal article once it has undergone the process of peer review.

Potential benefits of this study:

There shall be no direct benefit to the previous participants themselves, however, this study adds to the gaping paucity of knowledge regarding ECT prevalence and practice in South Africa. Thereby improving care for future patients.

By looking at indications and outcomes of patients receiving ECT at Valkenberg Hospital over an extended period, the hope is that this study will better allow us to identify and allocate resources to specific patients who may be in need of this treatment modality.

This study can also serve as a form of quality assurance for the ECT service at Valkenberg Hospital, looking at poor responses to treatment, adverse outcomes of the treatment itself as well as anesthetic complications. The utility of a study, such as this one, is in its ability to advocate for possible greater usage, recommendations for service improvement as well as the destigmatisation of ECT.

Potential Risks:

The risks inherent in this study are limited and have been managed proactively. This is a retrospective study therefore there are no potential physical risks at all to participants. Possible ethical breaches could be in the form of confidentiality; however, having strict data security measures implemented has mitigated these.

None of the patients identifying data such as names and folder numbers or dates of birth was published and only the researcher is privy to the above information. All patient information entered into the databases has been de-identified and all regulations related to the protection of participants and the security of health information has been abided to.

There are no potential conflicts of interest to report from the researchers.

Chapter 3

Results

Demographics:

In the 5-year study period from January 2015 to January 2020, 22 patients received ECT at Valkenberg Psychiatric Hospital. Demographic data shown in table 1 indicated that half the patients were 35 years of age or younger. Just over half (n = 12; 54.5%) were male. Almost three-quarters of the patients (n = 16; 72.7%) had less than 12 years of schooling, with the remaining (n = 6; 27.3%) having more than 12 years of schooling. Nearly everyone (n = 21; 95.5%) was unemployed, and the majority (n = 18; 81.82%) was single.

Table 1. Demographic data of the sample (*N*=22)

Age, years (mean age range)	18 - 35
Sex, *n* (%)	
Male	12 (54.5)
Female	10 (45.5)
Marital status, *n* (%)	
Single	18 (81.8)
Married	3 (13.6)
Divorced	1 (4.5)
Separated	0 (0)
Level of education, *n* (%)	
No Formal Schooling	0 (0)
Less than 12 years	16 (72.7)
More than 12 years	6 (27.3)
Employment, *n* (%)	
Employed	1 (4.5)
Unemployed	21 (95.5)

Clinical Characteristics:

Clinical characteristics shown in table 2 included psychiatric diagnosis. Diagnostic categories included psychotic disorders (n = 14; 63.6%); bipolar disorders (n = 4; 18.18%) and depressive disorders (n = 4; 18.18%). One patient with depressive disorder also had comorbid borderline personality disorder.

Most patients (n = 19; 86.4%) were previously treated with psychopharmacological, psychotherapeutic, and socio-occupational treatments only. The minority of patients (n=3; 13.64%) had previously received the aforementioned treatments in addition to ECT.

Current Treatment:

The main indication for ECT was catatonia (n = 12; 55%), followed by bipolar depression (n = 4; 18%). The least common indications for ECT were bipolar mania and schizophrenia (n = 1; 4%).

Patients received an average of 9 ECT sessions, ranging from 1 to 19 (see Table 2). In 20 patients, Propofol plus Suxamethonium were the anesthetic agents used. One patient had the latter plus Magnesium Sulphate and Glycopyrrolate, and another patient had the latter plus Glycopyrrolate.

Table 2. Diagnosis; Indications; Admissions; ECT Sessions

Diagnosis, *n* (%)	
Psychotic Disorders	14 (63.6)
Bipolar Disorders	4 (18.2)
Depressive	4 (18.2)
Anxiety Disorders	0 (0)
Trauma Related	0 (0)
Indication for ECT, *n* (%)	
Catatonia	12 (55)
Schizophrenia without Catatonia	1 (4)
Unipolar Depression	3 (14)
Bipolar Depression	4 (18)
Bipolar Mania	1 (4)
SCAD – Depression	1 (5)
SCAD – Mania	(0)
SCAD – Mixed affective state	(0)
*SCAD = Schizoaffective Disorder	
Number of Admissions, *n* (%)	
1st Admission	2 (9)
2nd Admission	11 (50)
3rd Admission	1 (4)
4th Admission	3 (14)
5 or more Admissions	5 (23)
Number of ECT Sessions, *n* (%)	
1 – 4	2 (9)
5 – 8	8 (36)
9 – 12	10 (45.5)
13 – 16	1 (4.6)
17 – 20	1 (4.6)

Treatment Response:

Table 3 represents treatment response. 81.8 % (n = 18) of patients had adequate short-term response to the treatment, with 4 (18.2%) patients having an inadequate response. Similarly, 72.7% (n = 16) had adequate long-term treatment response, 2 had an inadequate response, and in 4 patients the result was uncertain. Most patients (81.8%; n = 18) had no complications from treatment, with 2 patients having common complications (post ECT headaches in both cases) and 2 patients having uncommon complications (prolonged fasciculations and worsening suicidal ideation).

Table 3. Treatment Response (*N*=22)

Short Term Response, *n* (%)	
Poor	0 (0)
Inadequate	4 (18.18)
Adequate	18 (81.8)
Long Term Response, *n* (%)	
Poor	0 (0)
Inadequate	2 (9.1)
Adequate	16 (72.7)
Uncertain	4 (18.2)
Complications, *n* (%)	
None	18 (81.8)
Anaesthetic Related	0 (0)
Common ECT Related	2 (9.1)
Uncommon ECT Related	2 (9.1)

The 4 patients who had inadequate short-term response were from 4 different symptom clusters (mania, catatonia, unipolar depression and bipolar depression). 2 of the 4 patients with inadequate short-term responses had a primary psychotic disorder (n = 2; 9.1%).

Of the 2 patients who had inadequate long-term treatment responses, 1 had a primary diagnosis of unipolar depression and the other had a primary psychotic disorder.

All 4 of the patient's with inadequate short treatment responses were women (n = 4; 18.2%). Both of the 2 patients with inadequate long-term treatment responses were women (n = 2; 9.1%).

3 of the 4 patients with inadequate short-term responses were in the 18 – 35 year old age bracket (n = 3; 13.6%). The remaining 1 patient fit into the 36 – 50 year old age bracket.

ECT was discontinued in 6 patients: 1 was anesthetic related, 2 were ECT related, and 3 were for other reasons (one patient had worsening suicidal ideation, one was lost to follow-up). In the majority of cases, the length of seizures was adequate.

Discussion

The aim of this study was to review and audit the ECT practices at Valkenberg Psychiatric Hospital. The Objectives being to investigate the demographics, diagnoses, indications and outcomes of patients receiving ECT within a specialized psychiatric institution operating within the South African context.

The NICE guidelines define a clinical audit as: “a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change” (26). The audit cycle is a 5 stage structured process that includes preparing for the audit, selecting criteria, measuring performance level, making improvements and sustaining improvements. Clinical audits seek improvement through the use of action plans to surmount local barriers to change (27).

In our sample, a total of 22 patients received ECT from January 2015 to January 2020 with a total number of sessions of 196. This is less than 5 patients per year. So few patients may be indicative of a variety of factors such as accessibility, training, stigma and differences in patient population.
Benson-Martin et al, looking at ECT practices across South Africa in 2012 found that accessibility and training were factors that could be improved in order to expand ECT use (15). A study performed in the Czech Republic looking at the public perception of ECT found that 62% of respondents learned of ECT from the media, 30% believed it was abused by psychiatrists, 86% thought it caused long lasting and serious side effects and 22% believed it was not effective (28).

International literature indicates wide heterogeneity in use of ECT. A study looking at ECT practices across Japan in 2004 showed that out of the 46 hospitals surveyed, the number of patients receiving ECT per year varied according to hospitals in a wide range from 0.5 to 120 (29). Another study performed in India investigated 74 institutions. It found that 19,632 patients received 114,111 sessions of ECT from 316 psychiatrists. Further more, 52% received unmodified ECT, which indicates heterogeneity in ECT practice (30).

Internationally, female patients have been shown to have higher rates of ECT use of up to 68% as compared to males receiving ECT (16). A study performed in

Norway in 2011 showed a female to male ratio of 1:2 (31). However, another study performed in India found a male to female ratio of 1.56:1.
This study found that just over half of patients receiving ECT (54.5%) were male, which is in keeping with the literature out of India but is in contrast to Western literature. This gender discrepancy highlights differences in the patient populations seen at Valkenberg Hospital. The impact of poverty, substance use and mental health awareness all plays a role.

South Africa and the Western Cape in particular are undergoing a widespread substance use epidemic and methamphetamine is among the most prevalent (32). A study performed on illicit drug use and treatment in South Africa showed that the primary illicit substance at admission to substance user treatment centres was cannabis at 16.9% followed by methamphetamine at 12.8% (33). Wicomb et el performed a study assessing the patient profiles of adult acute admissions to Lentegeur Psychiatric Hospital in 2019. What was discovered was that 62% of patients used substances in the period leading up to their admission and that 73% more male patients used substances as compared to females (38%). Cannabis was found to be the most widely used substance at 51% followed by methamphetamine at 36% (34). Lentegeur Hospital is located in Cape Town, which is in the same city where Valkenberg Hospital is and the patient populations can be compared.
We postulate that substance use among male mental health users being admitted to Valkenberg Hospital may be impacting on the high turnover of male patients and well as the presentation of mental illnesses in male patients and therefore affecting the gender differences of male to female patients receiving ECT. More research will be needed in order to further explore this.

This study found that half (50%) of the patients were between the ages of 18-35. This is in keeping with another large-scale survey performed across South Africa in 2013, which showed a vast majority (89.2%) of patients receiving ECT were between the ages of 18 and 59 (15). A study performed across Australian institutes found that 38.4% of patients were in an age group of over 65 years, followed by 28% in an age group of 45-64 years (35). A limitation of this study is that our sample population ended at age 59. This is because ECT is not performed on geriatric patients at Valkenberg Hospital. Currently there is no data available on ECT use in the elderly in South Africa. More research is needed in this field. Another issue to highlight is that medically unwell patients do not receive ECT at Valkenberg Hospital.

Nearly three quarters of patients had less than 12 years of schooling and over 95% were unemployed. The majority (77.3%) were single. This is indicative of the sample population, most of who have been diagnosed with a severe mental illness and treatment resistance.

In terms of primary diagnosis, most patients were noted to have a psychotic disorder (63.6%) and only four had been diagnosed with a depressive disorder. Only one had a co-occurring borderline personality disorder. In the Norwegian study mentioned above, the most common diagnoses for which ECT was performed in descending order were: depression, bipolar disorder and schizoaffective disorder (31).

Interestingly, the main indication for ECT use was catatonia at 55% followed by treatment resistant bipolar depression at 18% then treatment resistant unipolar depression at 14%. The most common underlying cause for the catatonia was a psychotic disorder. The least common indications were for treatment resistant mania and schizophrenia without catatonia at 4% each.

This is in contrast to Western and other South African literature, which lists depression as the most common indication (15, 16, 31). However, It is well established that acute psychosis and schizophrenia are the primary indications for ECT in some Asian countries (36, 37). There is little evidence available that may explain this discrepancy, as ECT appears to be effective at managing the symptoms of various mental illnesses across multiple domains (38).

Although there is much overlap in the aetiology of complications seen in ECT, they may be divided into ECT related complications and anaesthetic related complications. This may further be subdivided into common and uncommon complications. Common complications include: postictal confusion, postictal agitation, anterograde memory dysfunction, retrograde memory dysfunction, headache, nausea and muscle aches (8). Uncommon complications include: cardiovascular complications, cerebrovascular complications, pulmonary complications, status epilepticus, prolonged seizures, dental trauma and death (39).

In this study, we found that most patients (81.8%) had no complications noted at all. 2 patients (9.1%) had common complications: post ECT headaches in both cases. 2 patients (9.1%) had uncommon complications: prolonged fasciculations and worsening suicidal ideation. In the latter case, the treating team made a clinical decision to stop the ECT sessions as the patient's symptoms (including suicidality) were worsening.

The findings above are comparable to international literature. A study performed in Nepal in 2016 showed that out of the 1095 patients investigated, none encountered any major complications (37).

No ECT or anesthetic deaths were documented in this study. A study performed in Texas in 2013 investigating ECT and all-cause mortality found that the death rate was 2.4 per 100,000 treatments for one day of ECT and that this rate increased to 18 per 100,000 within 14 days of treatment (40).

The average number of ECT sessions was 9. One patient had one ECT session then was lost to follow up and one patient had 19 sessions. Prolonged seizure length tended to be found in session one and two as well as session 12. This is in keeping with international literature, which gives an average course length of 8.5 ECT sessions (35).

Clinical outcomes were positive overall. 81.2% of patients had adequate short-term treatment response and 72.7% had adequate long-term treatment response. Treatment response was measured by length of seizure (short-term) and sustained improvement in symptoms (long-term). This is in keeping with international literature. A study performed in Singapore in 2016 showed ECT efficacy rates of between 40-70% in treatment resistant schizophrenia (41). Another study published in the European Journal of Neuropsychopharmacology showed pooled response rates in treatment resistant depression to be between 60-80% (38).

Stigma may be an important barrier to ECT use as demonstrated by Mausling et al in their investigation into the perceptions of ECT use among medical students in Stellenbosch, South Africa (21). However, stigma to ECT use may be addressed with improving insight into its practice. In a case study performed by Steiner in the Journal of European Psychiatry in 2012 – the hesitance to ECT use in this case was overcome by allowing the patient's son to accompany him to each of his 7 sessions of treatment. Steiner postulated that having the son present increased the patient's confidence and security and the team defeated stigma with "comprehension" (42). We postulate that more widespread insight focused strategies aimed at the primary care level as well as individual efforts such as the method demonstrated above may alleviate stigma around ECT.

In our study we found that the benefits of ECT far outweigh the risks. ECT is a robust and well-documented treatment strategy for refractory mental illness including catatonia, depression, mania and even psychotic disorders. This study seems to indicate that ECT is being underutilized within our context and this may be due to access to care, mental health literacy as well as stigma. With regard to stigma, media portrayals, lack of knowledge amongst health professionals and fear of adverse effects all add to the hesitancy of ECT use (21, 36).

Limitations

This study aimed to review the entire ECT service at Valkenberg Hospital over a 5-year period. The numbers of total participants appears to be relatively small, however, this does still provide an overview of the service.

This study is a retrospective cohort study, selection bias will be an inherent limitation given the referral process to the VBH ECT unit. This is mitigated by the fact that participants did not need to provide consent for participation, as all data published was confidential. Selection bias is also limited by the fact that we reviewed all patients who had ECT at the VBH ECT unit over the period in question.

This study did not document how ECT use effects total length of hospital admission nor did it capture data on how far into hospitalization ECT was utilized. This would be useful in future studies as this data could aid in resource allocation and decision-making.

Most of the participants in this study are a specialized population of psychopharmacological treatment resistant patients for whom ECT is an end stage treatment option. The outcomes, such as length of hospital stay and treatment response will therefore be markedly deviated when compared to the general population of psychiatric patients at Valkenberg Hospital.

This study did not record and categorize patient's folders into Mental Health Care Act status nor in-patient status. This would have been useful to further demonstrate demographic statistics and extrapolate possible correlations.

No specific verified rating scales were utilized to measure clinical outcomes and responses. As this was a retrospective folder review, we were not able to conduct rating scales prior to, during and after ECT treatments.

This study does not include adolescent or geriatric patients because these patients are not seen at Valkenberg Hospital and any information garnered from this study will not be generalizable to these patient populations.

Recommendations

ECT could be more widely utilized by improving hospital funding and staff training to provide this service. Funding more hospitals and enabling them to use ECT appropriately will lead to better outcomes for patients for whom ECT is indicated.

More funding for research in ECT in South Africa is needed to address the paucity of knowledge around ECT use and practices. More audits of ECT units across South Africa would provide data to aid in decision-making regarding resource-allocation in the current climate.

This audit revealed that there was limited use of objective measures of patient outcomes noted in the patient folders as well as the ECT service file. The use of symptom rating scales may prove useful in gaining a baseline objective clinic measure as well as monitoring of treatment response in patients receiving ECT at VBH. The use of rating scales may also aid in facilitating further research on ECT.

Conclusion

In summary, this study was a retrospective chart review looking at the ECT service at Valkenberg Psychiatric hospital. This was a worthwhile study with much potential for utility across the psychiatric spectrum of illnesses. We aimed to add to the body of South African knowledge around ECT. This study was conducted ethically and in all accordance with HREC guidelines and principles.

This study found that ECT sessions had low complication rates and high rates of adequate short-term outcomes. In this setting ECT was primarily used in treatment resistant patients. ECT is being underutilized as a treatment option and more research needs to be done in this area.

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Appendices

Appendix 1:

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

08 February 2022

HREC REF: 083/2022

Dr L Dannatt
Department of Psychiatry & Mental Health
GSH
Email: lisa.dannatt@uct.ac.za
Student: keaganclay@gmail.com

Dear Dr Dannatt

PROJECT TITLE : THE USE OF ELECTROCONVULSIVE THERAPY IN THE TREATMENT OF PSYCHIATRIC CONDITIONS AT VALKENBERG PSYCHIATRIC HOSPITAL IN CAPE TOWN. A RETROSPECTIVE STUDY-MMED CANDIDATE-DR KEAGAN CLAY

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, our letter dated 02 February 2022 provides guidance found on our website: http://www.health.uct.ac.za/fhs/research/humanethics/forms

Approval is granted for one year until the 28 February 2023.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: - Dr Keagan Clay will also be involved in this study.

Please quote the HREC REF 083/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN

CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637. Institutional Review Board (IRB) number: IRB00001938 NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2020), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Appendix 2:

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
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5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za

REFERENCE: WC_202202_021
ENQUIRIES: Dr Sabela Petros

University of Cape Town
Anzio Road
Observatory
Cape Town
7925

For attention: Dr Keagan Clay

Re: The Use of Electroconvulsive Therapy in the treatment of psychiatric conditions at Valkenberg Psychiatric Hospital in Cape Town. A Retrospective Study.

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.
Please contact the following people to assist you with any further enquiries in accessing the following sites:

Valkenberg Hospital	**Ms Estelle Malgas**	**021 826 5805**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted and the constraints caused by the Covid-19 epidemic above are respected and adhered to.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**Annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
4. The reference number above should be quoted in all future correspondence.

Yours sincerely

PROF. V ZWEIGENTHAL
DIRECTORATE: HEALTH INTELLIGENCE
DATE: 10 March 2022
CC