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The Impact of ECT on the Mean Duration of Hospitalisation of Patients in the Psychiatric Unit, Kath, Kumasi, Ghana

Addo FM[1,2,3], Adjaottor ES[1,2], Amoah C[1,2], Asare J[3], Appiah F[3] Amankwaah GB[1]
Corresponding Author:
Dr. Frimpong-Manso Addo MBChB, DPM, MRCPsych.

[1]Department of Behavioural Sciences, College of Health Sciences.
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana;

[2]Komfo Anokye Teaching Hospital, Kumasi, Ghana
[3]Kwame Nkrumah University of Science and Technology (KNUST) Hospital, Kumasi Ghana

Dr. Emma Sethina Adjaottor, Senior Lecturer/Clinical Psychologist, Head of Department of Behavioural Sciences

Christian Amoah, Lecturer and Clinical Psychologist

Jephthah Asare, Statistician, Dip Public Health 1 Adelante Close, Stoke Gifford, Bristol, UK BS34 8RT

Freeman Appiah,
Assistant Clinical Psychologist

Gifty Boakye Amankwaah, Research Assistant, Department of Behavioural Sciences.

Abstract

➢ **Background**

The impact of ECT on the duration of hospitalisation of patients at the Psychiatric directorate in the Komfo Anokye Teaching Hospital (KATH), in Kumasi-Ghana, has not been investigated yet, although the available evidence on the speed and effectiveness of ECT in treating severe mental illnesses like Major Depressive Disorder (MDD), Bipolar Affective Disorder (BAD) and Schizophrenia has been documented extensively globally.

➢ **Aims and objectives**

To investigate the impact of ECT treatment on the mean length of hospitalisation of patients treated with it compared to those who were not, at the Psychiatric directorate of KATH with the aim of offering evidenced-based clinical advice to the managers, practitioners, patients and their carers on the therapy.

➢ **Method**

Using archival research method, data on patients treated at the Psychiatric directorate of KATH, from 1st July 2016 to 30th June 2017 when ECT was part of the treatments offered in the unit (The ECT group) and 1st July 2018 to 30th June 2019 when no ECT treatment was not available (No ECT group), were extracted from their clinical records, analysed and compared with emphasis on the mean duration of hospitalization for each group. The same comparison was done for their diagnostic subgroups.

➢ **Results**

ECT treated patients had a longer mean length of hospitalisation compared to non-ECT treated patients. ECT treated Schizophrenia patients had a significantly longer mean length of hospitalisation but ECT treated Postpartum psychosis patients had an insignificant longer mean length of hospitalisation with p-Values at the 5% level. ECT had no impact on the mean length of hospitalisation for BAD patients.

ECT treated depressed patients had an insignificant shorter mean length of hospitalisation at the 5% level.

➢ **Conclusions**

Patients treated with ECT are more likely to be hospitalised longer than their counterparts who are treated with other interventions. The impact, depending on diagnoses, is variable. Clinicians must consider recommending ECT earlier to who might need it in order not to prolong their period of hospitalization.

Keywords:- *Electroconvulsive Therapy, Severe Mental Disorders, Duration of Hospitalisation, Pharmacotherapy, Treatment Resistance.*

I. INTRODUCTION AND BACKGROUND

Experience from working with people suffering from severe and enduring mental illnesses like Schizophrenia, Severe depression with psychotic symptoms, Bipolar Affective Disorders (BAD) and Postpartum Psychosis

reveals that, such individuals, depending on the nature, content and severity of their symptoms, are under siege, extremely distressed and most importantly, are on the cliff-edge of causing harm to themselves, others and properties. Their functional ability and behaviour become disturbed compared to their premorbid levels. Keeping them in hospital for days and weeks for treatment, also has its unwelcome consequences, for example, loss of some of their activities of daily living (ADL) skills, disturbed behaviour and suicide tendencies.

Any intervention that can expediently alleviate them from their demise should be offered as promptly as possible. Electroconvulsive therapy (ECT) is one of such interventions that research evidence has repeatedly and consistently documented to alleviate rapidly, some of such distressing and anxiety provoking psychiatric symptoms [1]

Since the1940s, ECT has been considered the most effective intervention for alleviating severe mood disorders and, indeed, positive psychotic symptoms. [1,2]

No treatment, pharmacological or otherwise, has matched ECT in speed or likelihood of remission of major depressive episodes. [1] Electroconvulsive therapy is equally effective in unipolar and bipolar depression and has profound anti-manic properties, all in the short term.[3] Several long-term follow-up studies have suggested that patients who receive ECT have reduced mortality of all causes relative to non-ECT control patients. [4]

A meta-analysis of 18 studies found that ECT was significantly more effective than pharmacotherapy in the short term for depressive illness. [5] It is likely to be the most effective intervention available in the treatments available for some special mental illnesses like catatonic schizophrenia or stupor and schizophrenia with neuroleptic malignant syndrome secondary to pharmacotherapy with neuroleptics and mental healthcare of special cases which require rapid improvement in the Mental state of the sufferers. It has also been shown to be as cost-effective as pharmacotherapy. [6]

Researchers have reported that ECT reduces the overall length of hospital stay for patients treated with it for depression.[2,4,7] Patients who were treated promptly with ECT stayed a mean of 13 fewer hospital days compared to those depressed patients who were treated with tricyclic antidepressants. [8]

Other researchers have reported conflicting results from their studies and concluded that where ECT is used more conservatively, the length of hospitalisation for patients has been shown to be longer than those given medication alone. [5,9]

Despite all the strong evidence in favour of ECT as a speedy and effective treatment for severe psychiatric disorders in the short term, its utilisation is on decline. [1] Those who are treated with it have to endure the pain, anxiety and distress they experience from their symptom profiles until they satisfy the criteria for treatment failure or resistance, defined as failure to clinically respond to, at least, two trials of separate medications at optimum or adequate dosages for a reasonable period of time, usually days and weeks.[10] This means that ECT treated patients are at risk of staying longer in psychiatric hospitals compared to their counterparts who are "dubbed" pharmacotherapy responders.[11] Some concerned authors have reiterated that, despite the available robust evidence that ECT is an effective treatment for some mental illnesses, its use remains controversial and is declining in some countries. It is viewed as a 'treatment of last resort', and its sustainability may be undermined. Given its proven clinical effectiveness and cost-effectiveness, ECT should continue to be recognised as an important part of mental healthcare delivery which should remain in the 'toolbox' of mental health remedies.

II. AIMS AND OBJECTIVES

The electroconvulsive therapy machine of the Psychiatric Directorate of the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, irreparably broke down in June 2018. The researchers who work in the Directorate decided, as one of several objectives, to investigate the impact of ECT treatment on the mean length of hospitalisation of psychiatric patients at the Directorate or Unit, as part of the aims to persuade the Hospitals' managers and purchasers who hold procurement and payment powers for logistics to invest financially in procuring a new and modern replacement ECT machine. The same impact, depending on the diagnoses, was investigated to inform practitioners, patients and their carers on recommending and consenting to ECT as a treatment option.

III. METHODOLOGY

The research was a retrospective cohort study looking at the impact of Electroconvulsive Therapy utilisation on the overall mean length of hospitalisation on two groups of patients admitted to the Psychiatric Directorate of KATH, from 1st July 2016 to 30th June 2017 when ECT was part of the treatments offered in the unit (The ECT group) and those admitted to the same Unit from 1st July 2018 to 30th June 2019, when no ECT treatment was available (No ECT group). A subgroup data analysis was also done to compare the same outcome, based on the diagnoses of Severe Mental Disorders, particularly, Schizophrenia, Major Depressive Disorder (MDD), Bipolar Affective Disorder (BAD) and Postpartum Psychosis (PP) of patients from the two groups.

The study may also be considered as a quasi-randomised case-control study of the impact of ECT on the mean length of hospitalisation of psychiatric patients who received ECT compared to those who did not.

Ethical approval number CHRPE/AP/287/20 was sought from the Committee of College of Health Sciences (CHS), Kwame Nkrumah University of Science and Technology (KNUST) and KATH.

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➢ *Study population*

The Psychiatric directorate admits adult psychiatric patients aged 16 years and above. Patients who stayed in the unit for two days or more well included whereas patients who stayed less than that were excluded. Data on all patients admitted to the unit during the two periods were collected from the records office. These were compared with the unit's Admissions and Discharges (A & D) log book which contains abstracts of inpatient stays, demographic information collected at admission, diagnoses, admission and discharge dates, procedures and other information typically used for the purposes of billing, to ensure that almost all admitted patients and their information were captured and that, their length of hospitalisation could be calculated.

Patients who were admitted in the period 1st July 2016 to 30th June 2017 (one year) when the ECT machine was functional was used as the experimental cohort while those who were admitted during the year 1st July 2018 to 30tht June 2019, when the ECT machine had broken down, were used as the control group.

The researchers had no control over patients' admissions to the psychiatric unit during the two study periods because they were randomly and naturally admitted, had similar demographic variables and came from the same geographical or catchment area of KATH. Again, the epidemiology of psychiatric disorders of patients admitted to the psychiatric unit remained the same for the two groups. Therefore, biases and confounders, if any, were deemed equally distributed for the two groups.

For patients who had multiple admissions during the year in question, data from the most recent admission were used for the study. To ensure that end dates of admissions were captured, information on patients admitted during the last month of the specified calendar years in question, were collected till the discharge date (which fell outside the stated dates for a few patients).

It was ensured that inpatients' principal psychiatric diagnoses conformed to International Classification of Diseases (ICD-10), World Health Organisation (WHO), 1992) specifiers, categories and codes.

Patients' data were fully de-identified without names and addresses, and consequently the study was deemed exempt from informed consent by the study subjects. Permission was granted by the Ethics Committee (CHRPE) to this effect.

The mean length of hospitalisation was calculated by dividing the total admission days for all included patients by the number of patients included in the study for each group - ECT and No ECT. Again, the mean duration of hospitalisation for each diagnostic subgroup was calculated by dividing the total admission days for all patients with that diagnosis by the number of patients in that diagnostic category. The means of the two groups and their diagnostic subgroups were compared to find out the impact of ECT on the mean length of hospitalisation.

➢ *Study Hypothesis*

Based on previous research evidence that ECT treatment produces rapid resolution of symptoms of severe mental disorders and may reduce suicidal thinking.[2,3,7,12] It was hypothesized that psychiatric patients admitted and treated with ECT would have a shorter mean length of hospitalization compared with similar patients who were not treated with it. The impact of ECT treatment on the mean length of hospitalisation for the diagnostic subgroups based on the diagnoses of severe mental illnesses, specifically MDD, BAD, Schizophrenia and most importantly, Postpartum Psychoses which has its inherent risks for the mother and often, the new-born baby was examined.

IV. RESULTS AND ANALYSIS

Data on 223 out of 225 patients admitted to the KATH Psychiatric unit from 1st July 2016 to 30th June 2017, when ECT was available (ECT group) were analysed while 260 out of 272 patients were included for the 1st July 2018 to 30th June 2019 (No ECT group). 2 and 13 patients were excluded from the ECT and No ECT groups respectively, because of missing or inadequate information, mainly, missing admission or discharge dates and diagnoses. Two of the 13 excluded patients from the control (No ECT) group transferred to different psychiatric units elsewhere in the country because they clinically needed ECT treatment.

Data for the two study groups were analysed grossly with emphasis on the mean length of stay for all patients in days for each group (Table 1) and then the two groups compared with each other according to diagnoses (Table 2) using Windows Excel. These were presented graphically to give pictorial or snap view of the differences (Graphs 1, 2 & 3). The significance of the differences in the respective mean lengths of hospitalisation were statistically assessed with the respective p-Values at the 5% level. Data on the two groups are tabulated in Tables 1 and 2 below:

Cohort	Number of patients	Total number of admission days	Mean duration of hospitalisation in days
ECT	223	2567	11.5
No ECT	260	2891	11.1
Grand total	483	5458	11.3

p-Value = 0.208 for the difference in the mean duration for the 2 Cohorts

Table 1:- ECT and No ECT Cohorts and their Mean Length of Hospitalisation

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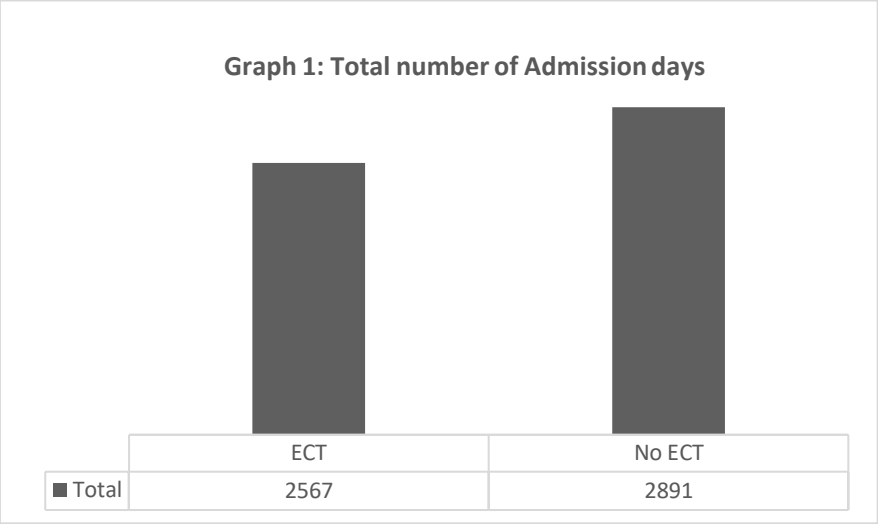

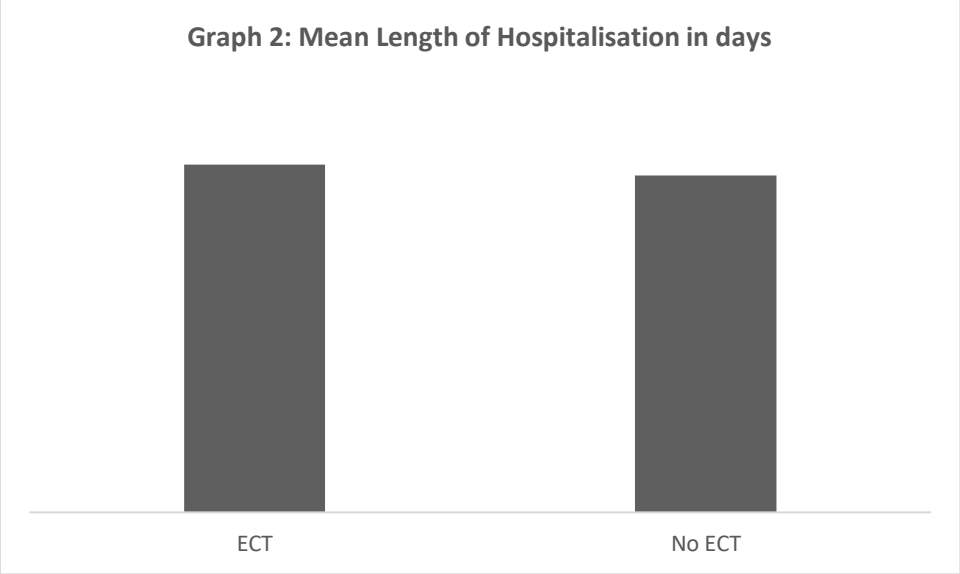

DIAGNOSIS	NO ECT COHORT			ECT COHORT			Difference in Means (No ECT – ECT)	P=Value
	No. of Patients	Total Hospitalisation Days	Mean Length of Hospitalisation	No. of Patients	Total Hospitalisation Days	Mean Length of Hospitalisation		
Major Depressive Disorder	9	108	12	17	102	6	6	0.735
Post-Partum Psychosis	3	18	6	5	64	13	-7	0.256
Schizophrenia	100	900	9	166	1264	12	-3	0.028
BAD	77	924	12 (12.2)	54	648	12 (11.6)	0	0.532
Manic Disorder	10	186	18.6	10	136	13.6	5	0.157
Acute Psychosis	19	193	10.2	11	117	10.6	-0.4	0.138

Table 2:- Admitted patients, their diagnoses during July 2016 to June 2017 (ECT group) and July 2018 to June 2019 (No ECT group) and their duration of hospitalisation

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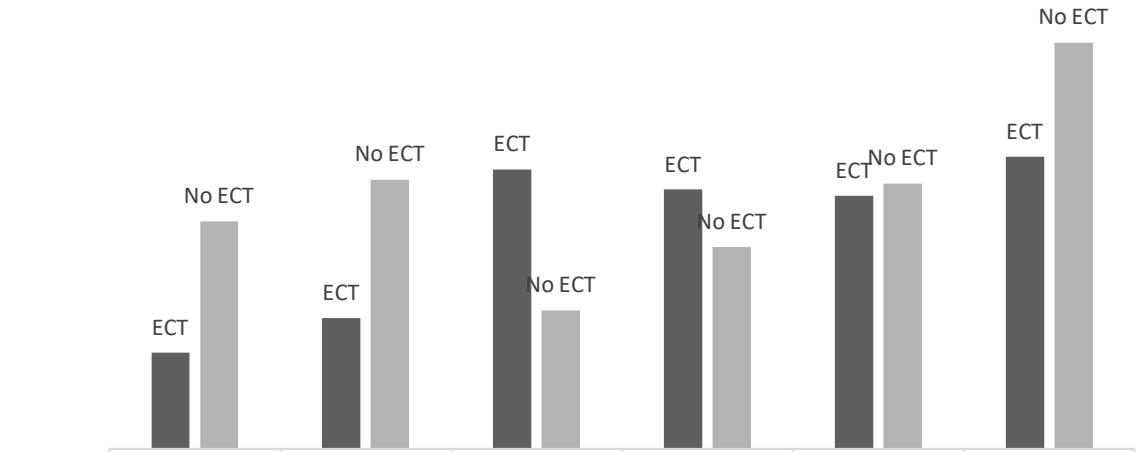
Graph 3: Mean Duration of Hospitalisation with ECT & Without ECT by Diagnoses



	Acute Psychosis	Depression	Post Partum Psychosis	Schizophrenia	BAD	Manic Disorder
ECT	4.4	6.0	12.8	11.9	11.6	13.4
No ECT	10.4	12.3	6.3	9.2	12.2	18.6

Review of patient records showed that 223 patients qualified for the ECT group with a total of 2567 hospitalisation days and 260 patients with 2891 hospitalisation days for the No ECT group.

1) The gross mean duration of hospitalisation for the ECT and No ECT groups revealed that, overall patients stayed only slightly longer when ECT was available with 11.5 and 11.1 days respectively (graph 2). However, the difference in the mean length of hospitalisation of 0.4 day was statistically insignificant with p-Value = 0.208 at the 5% level.
2) MDD (both first episode and recurrent) and Manic Disorder patients when ECT was available, had insignificantly shorter mean durations of hospitalisation compared to their No ECT counterparts (6 vs 12 and 13.6 vs 18.6 days respectively) at the p-Value = 0.735 and 0.157 respectively, at the 5% level.
3) ECT did not affect the mean duration of hospitalisation for patients who were treated for BAD during the two study periods with approximately equal mean duration of 12 days (Table 2); p-Value = 0.532 at the 5% level.
4) Schizophrenia patients, when ECT was available, stayed in hospital for a significantly longer mean duration of days compared to their No ECT counterparts with 12 vs 9 respectively; p-Value = 0.028.
5) Postpartum Psychosis and Acute Psychosis patients, when ECT was available were hospitalised longer with insignificantly longer mean durations of hospitalisation compared to their No ECT counterparts - 13 vs 6 and 10.6 vs 10.2 days respectively; p-Value = 0.256 and 0.138 respectively, at the 5% level.

V. DISCUSSION OF RESULTS

From the available literature, this is the first study to indirectly examine the impact of ECT on the length of hospitalisation for patients suffering from severe mental disorders in a Ghanaian Teaching Hospital, KATH. Previous studies have found that treatment with ECT is associated with rapid remission from depressive disorders and reductions in mortality in individuals with MDD but a few investigated its impact on the duration of hospitalisation.[13]

The overall mean length of hospitalisation for patients treated with medications and other forms of treatment (No ECT cohort) was shorter, compared to that of those who had ECT as part of their treatment options (ECT cohort). However, the difference was statistically insignificant at the 5% level.

Considering the diagnostic subgroup comparisons, ECT treated Schizophrenia patients are less likely to be discharged earlier than their non-ECT treated counterparts. It had a statistically significant negative impact on the mean duration of hospitalisation of people treated for Schizophrenia in the study population at the 5% level.

ECT did not have any impact on the mean length of hospitalisation for BAD patients with approximately equal means for the two groups with p-Value of 0.532 at the 5% level.

On the other hand, ECT treated patients had an insignificant shorter mean length of hospitalisation with a p-Value = 0.735 at the 5% level compared to their No ECT treated depressed counterparts.

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VI. CONCLUSIONS

Generally, ECT treated patients are likely to spend more days in hospital compared to their counterparts who are treated with pharmacotherapy and other interventions at the Psychiatric Directorate of the Komfo Anokye Teaching Hospital in Kumasi, Ghana. Regarding diagnoses, only depressed patients treated with ECT are likely to be hospitalised for fewer days compared to their counterparts who are treated with pharmacotherapy and other interventions but the difference is statistically insignificant. ECT has no impact on the duration of hospitalisation of patients with Bipolar Affective Disorder. However, Patients with diagnoses of Post-Partum Psychosis and Schizophrenia are hospitalised longer with the latter being statistically significant. These findings contradict with abundant evidence that ECT resolves psychiatric symptoms faster than Pharmacotherapy, which implies that, ECT treated patients are more likely to spend fewer days in the hospital.

VII. STRENGTHS, LIMITATIONS AND RECOMMENDATIONS

The study design is a retrospective comparative study of two cohorts, cases and controls, of psychiatric patients in two different years in the same geographical environment with the same population demography and climatic conditions. It was assumed therefore assumed that, the patients were admitted naturally without bias and that all the patient demographic variables, diagnoses and other confounders were equally and naturally distributed. Again, the absence of ECT for the 2018/2019 group was a natural phenomenon. Research ethics wouldn't allow established effective ECT to be withheld from patients who would otherwise benefit from it. These unique phenomena should be considered as a strength of this research.

It was not ascertained how treatment resistant patients who would have been prescribed ECT, particularly BAD patients who had similar length of stay for the two cohorts, were treated during 2018/2019 when ETC was unavailable at KATH. Potentially, this creates a myth that ECT is not needed as a back-up for pharmaco-psycho-therapy in the management of BAD patients.

The issue of treatment delays with ECT by professionals has been documented.[14] Again, others have blamed factors like stigma deterring patients to consent to it sooner. [15] It is possible that lack of experience and confidence on the part of professionals in recommending and administering the treatment to patients might have contributed to the findings of this study. This could not be ascertained in this study.

Further research is needed to explain the reason(s) why ECT prolonged the mean length of hospitalisation for patients and their diagnostic subgroups, except for those with depression, in the ECT treated group at KATH. It is important to note that researchers criticised studies that have examined the impact of ECT on the length of hospitalisation for failing to distinguish between patients who received ECT early in the course of their admissions from those who received it after a medication trial, i.e., combining all patients who received ECT at any time into one group for comparison purposes. [15]

The renowned National Institute of Clinical Excellence (NICE) Guidance 2009 recommend that ECT should be prescribed for severe, life-threatening depression and when a rapid response is required, or when other treatments have failed. The earlier 2003 edition also suggested that ECT should be used only to achieve rapid and short-term improvement of severe symptoms after an adequate trial of other treatment options has proven ineffective or when the condition is considered to be potentially life-threatening, in individuals with severe depressive illness, catatonia and a prolonged or severe manic episode. This guidance may be ambiguous and unhelpful to professionals with inadequate experience and their patients, besides causing delays in its prescription and prolonging hospitalisation duration.

Considering the economic and psychosocial implications of staying longer in hospital to patients, their families and carers if one is treated with ECT, it is advocated from this research that ECT could be recommended promptly to special patients like those from poor socio-economic background and developing countries with lower per capita income and parents with childcare responsibilities. It could be considered as a first line treatment informed by the special characteristics and circumstances of such patients.

Bipolar mania patients present with a lot of distress, risks to themselves, others and properties and require expedient treatment. This research did not reveal benefits from ECT in terms of reducing the duration of their hospitalisation and its potential socio-economic ramifications. It is likely that when ECT was available at KATH, pharmacotherapy was tried as first line of intervention for days and weeks before considering ECT [14.] It must be advocated that ECT needs to be considered strongly and jointly with the patient and their carers, as one of the first line treatment options in special cases and moreso, if the patient has had a previous response to it.

Postpartum mental disorders require expedient treatment because they affect not only the mother, but indirectly the new-born baby too. ECT is known to speed up resolution of symptoms of these disorders and therefore can promote a nurturing and dynamic bonding between the mother-baby duo. This study has revealed that postpartum patients treated with ECT are at risk, although insignificant, of being hospitalised longer than when treated with medications. Therefore, ECT could be considered as a first line intervention in severe postpartum psychiatric disorders. It is likely that untold numbers of patients would experience better outcomes by receiving earlier, an intervention that is often life altering and, for those who are suicidal, lifesaving.

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