Factors Associated with High Rate of hospital Admission in A Sample of Patients with Psychosis during the COVID pandemic

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Factors Associated with High Rate of hospital Admission in A Sample of Patients with Psychosis during the COVID pandemic

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Abstract

Purpose: Studying the factors associated with increased number of admissions among psychosis cases especially in the COVID era, is critical to reduce unnecessary hospitalization with all its subsequent burdens.

Aim: This study was part of an EPUT service review and also a quality improvement project of Cambridge chief resident management and leadership development program, which is a joint-program between the Judge business school and Cambridge university.

Methods: Data was extracted from the digital records of Mid and East Essex psychosis teams. The Mid Essex psychosis team covers specialist psychosis services in Braintree, Chelmsford, Maldon and its surroundings. East Essex psychosis team covers specialist psychosis services in Colchester, Clacton-on-Sea and its surroundings.

Results: 15% of the patients in the sample were under CTO. Patients who were under CTO had significantly higher total number of admissions compared to those not under CTO (p=0.014). Similarly, the 2 groups showed a statistically significant difference in the number of formal admissions and the number of pre-COVID admissions per year, which were higher in the CTO group (p=0.005, p=0.021 respectively). 20% of the patients in the sample were receiving clozapine. Clozapine patients had significantly higher total number of admissions compared to non-clozapine patients (p=0.003). Similarly, the 2 groups showed a statistically significant difference in the number of formal admissions, which was higher in the clozapine group (p=0.011).

Patients who had changes in care due to COVID (telephone and video consultations) when compared to patients who had care as usual showed a significant difference in the number of admissions during the first year of the COVID pandemic. The number of COVID admissions was significantly less in patients who had changes due to COVID. (p=0.034). In line with the results from comparisons, clozapine was associated with higher total number of admissions (p=0.001) and number of formal admissions (p=0.001). These associations had large effect sizes (partial Eta2=0.25 and 0.257 respectively). Similarly, CTO was associated with higher number of formal admissions (p=0.027). This association had medium effect size ((partial Eta2=0.129). In addition, changes in care due to COVID-19 were associated with less number of admissions during the first year of the COVID pandemic (p=0.006, partial Eta2=0.189, large effect size). Forensic history was associated with higher number of formal admissions (p=0.042, partial Eta2=0.11, medium effect size). PBR cluster score was directly correlated with both the total number of admissions (p=0.016) and the number of formal admissions (p=0.021).

Conclusions: CTO, clozapine use and forensic history were associated with higher risk of hospital admission in patients with psychosis. Whereas, having supportive network, receiving psychological intervention and documentation of early relapse signs were associated with lower risk of admission. Furthermore, preliminary evidence shows that telepsychiatry is a suitable alternative to standard care during the COVID-19 pandemic.

Keywords: COVID pandemic, hospital Admission, Psychosis

1. Introduction:

Patients with functional psychoses who require treatment for more than 2 years and show evidence of dysfunction are considered severe mental illness patients (SMI) (Ruggeri et al., 2000). These patients are particularly more prone to relapse, emergency presentation and subsequent hospital admissions (Leach et al., 2018). Hospitalization, specifically formal admission, in patients with SMI is considered a stressful experience to the patients and their carers. Moreover, inpatient and community-based mental health services represent 47% of the annual healthcare costs for patients with SMI in the UK (Ride et al., 2020). Furthermore, the number of new detentions under the mental health act (MHA) has reached 50,893 in the year (2019-2020) (Official statistics, 2019-20), which in turn reflects a financial burden on the English National Health Service (NHS).

The Care Program Approach (CPA) has developed in the UK to address concerns about the safe management of patients with SMI in a community setting. A core component of CPA is to develop preventive strategies such as crisis planning, which relies on identifying individual risk factors associated with relapse and hospital admission (Simpson et al., 2016). These factors include socio-demographic, socio-economic variables as well as clinical variables such as positive symptoms of psychosis, lack of insight and social support (Walker et al., 2019). Studying the factors associated with increased number of admissions, especially in the COVID era, is critical to reduce unnecessary hospitalization with all its subsequent burdens.

The COVID pandemic has had profound effects on health services. Following the guidance of NHS in March 2020, Essex Partnership University Trust (EPUT) introduced remote consultation services to the outpatient clinic using AccuRx software and work phone for video and telephone consultations respectively. Only patients who did not adapt to telephone or video consultations were seen face-to-face (NHS England, 2020). This shift to tele psychiatry was considered a novel challenge to both service users and service providers. We hypothesized that this change in the type of care had an indirect impact on the number of admissions in patients suffering from psychoses.

This study was part of an EPUT service review and also a quality improvement project of Cambridge chief resident management and leadership development program, which is a joint-program between the Judge business school and Cambridge university.

2. Methods:

2.1. Population

Data was extracted from the digital records of Mid and East Essex psychosis teams. The Mid Essex psychosis team covers specialist psychosis services in Braintree, Chelmsford, Maldon and its surroundings. East Essex psychosis team covers specialist psychosis services in Colchester, Clacton-on-Sea and its surroundings.

2.2. Sample

Studied sample included forty patients that were randomly withdrawn from the records of Mid and East Psychosis team. Twenty patients were selected from each team using a quota system.

2.3. Variables

Total number of admissions: This included the sum of previous formal and informal admissions throughout the duration of illness of each patient till the date of data collection (8th of March 2021).

Formal admissions: This included the number of detentions under the MHA throughout the duration

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of illness of each patient till the date of data collection (8th of March 2021).

Informal admissions: This included the number of voluntary admissions throughout the duration of illness of each patient till the date of data collection (8th of March 2021).

COVID-19 admissions: This included the number of admissions for each patient during the first year of the pandemic (8th of March 2020 to 8th of March 2021).

Changes due to COVID-19: This variable is a dichotomous categorical variable, i.e., patients who underwent changes in their usual care in the form of telephone, video consultations or both were classified in one category and compared to those who received care as usual only during the first year of the pandemic.

Payment-by-results (PBR) cluster: Mental health PBR is a prospective payment system that aims to predict mental health service cost for patients with mental health problems. The system depends on the ability of the patients' clusters derived from Health of Nations outcome scale (HoNOS) to predict the cost of mental health service provided.

Community treatment order (CTO): Under the mental health act, CTO is arranged by the responsible clinician to provide supervised community treatment mainly for patients with high risk of relapse and not engaging with services. This variable is a dichotomous categorical variable in which patients who were under CTO were compared to those who are not under CTO.

Clozapine use: This variable is a dichotomous categorical variable in which patients who received clozapine were compared to those who did not.

Psychological intervention: according to standards 2 and 3 of national clinical audit of psychosis, psychological interventions for patients with psychosis should include cognitive behavioral therapy (CBT) and family intervention. This variable is a dichotomous categorical variable in which patients who received psychological interventions were compared to those who did not.

Supportive network: This variable is a dichotomous categorical variable in which patients who had strong supportive networks were compared to those who did not.

Documentation of relapse signs: This variable is a dichotomous categorical variable in which patients who had relapse signs documented in their entries were compared to those who did not.

Alcohol History: This variable is a dichotomous categorical variable in which patients who had problems with alcohol misuse were compared to those who did not.

Substance History: This variable is a dichotomous categorical variable in which patients who had substance misuse were compared to those who did not.

Forensic History: This variable is a dichotomous categorical variable in which patients who had been previously cautioned, charged or convicted were compared to those who had no recorded forensic history.

2.4. Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics V21.0: IBM Corp. Mann Whitney U was used to compare the number of admissions across two groups of categorical variables. Kruskal–Wallis test was used to compare the number of admissions across three or more groups of categorical variables. The Spearman correlation coefficient was used to measure correlations between two continuous variables. Effect sizes (partial Eta squared) were measured using univariate analysis for nominal by interval relationships. Partial Eta squared >0.14 was considered large effect size, 0.06-0.14 was considered medium effect size (Green et al., 1997).

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3. Results

3.1. Demographic variables

The mean age of the sample was 50.7 years old. The minimum age was 19 years old while the maximum was 86. 42.5% of the sample were males while 57.5% were females. The majority of the sample were white British (87.5%). Almost half of the sample were unemployed (52.5%). 17.5% had supported accommodation/residential and 5% were homeless. The mean duration of illness was 13.6 years. Most of the participants had PBR cluster more than 10 (82.5%). 20% of the sample had alcohol misuse problems while substance misuse was 30%. During the first year of the COVID-19 pandemic, 57.5% of patients received no changes to the usual care (face-to-face consultations in outpatient clinics). In the contrary, 42.5% of the patients had changes in their usual care in the form of telephone or video consultations or both. 17.5% of the sample had forensic history. The average number of admissions within the sample including formal and informal admissions was 3.9 admission.

3.2. Comparisons:

15% of the patients in the sample were under CTO. Patients who were under CTO had significantly higher total number of admissions compared to those not under CTO ($p=0.014$). Similarly, the 2 groups showed a statistically significant difference in the number of formal admissions and the number of pre-COVID admissions per year, which were higher in the CTO group ($p=0.005$, $p=0.021$ respectively).

20% of the patients in the sample were receiving clozapine. Clozapine patients had significantly higher total number of admissions compared to non-clozapine patients ($p=0.003$). Similarly, the 2 groups showed a statistically significant difference in the number of formal admissions, which was higher in the clozapine group ($p=0.011$).

Patients who had changes in care due to COVID (telephone and video consultations) when compared to patients who had care as usual showed a significant difference in the number of admissions during the first year of the COVID pandemic. The number of COVID admissions was significantly less in patients who had changes due to COVID. ($p=0.034$).

Although alcohol and substance misuse are widely considered as strong risk factors for relapse (Drake et al., 1998), there was no significant difference in the number of admissions between psychotic patients with alcohol or substance misuse problems and those without.

3.3. Correlations

In line with the results from comparisons, clozapine was associated with higher total number of admissions ($p=0.001$) and number of formal admissions ($p=0.001$). These associations had large effect sizes (partial Eta^2=0.25 and 0.257 respectively). Similarly, CTO was associated with higher number of formal admissions ($p=0.027$). This association had medium effect size ((partial Eta^2=0.129). In addition, changes in care due to COVID-19 were associated with less number of admissions during the first year of the COVID pandemic ($p=0.006$, partial Eta^2=0.189, large effect size). Forensic history was associated with higher number of formal admissions ($p=0.042$, partial Eta^2=0.11, medium effect size). PBR cluster score was directly correlated with both the total number of admissions ($p=0.016$) and the number of formal admissions ($p=0.021$).

3.4. Regression analysis

A standard multiple regression was performed to assess the ability of the following variables to predict the total number of admissions: (CTO, clozapine use, forensic history, documentation of early relapse signs, supportive network, psychological intervention and PBR cluster). Results show that

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40.3% of the variance in the total number of admissions can be accounted for by the seven aforementioned predictors, collectively, $F_{(7, 31)} = 4.659$, $p = .001$. Looking at the individual contributions of the predictors, having a positive forensic history contributed to higher total number of admissions ($\beta=3.993$, $t=2.498$, $p=0.018$) while having a supportive network contributed to lower number of admissions ($\beta= - 3.612$, $t= - 2.529$, $p=0.017$).

The change in care due to COVID-19 was used in another standard regression model to predict the number of admissions during the first year of COVID pandemic. 16.7% of the variance in the number of admissions during this year can be accounted for by the changes implemented in the type of care, $F_{(1, 36)} = 8.402$, $p = .006$. Changing the type of care to telephone or video consultation contributed to less number of admissions during the first year of the pandemic ($\beta= - 0.458$, $t= - 2.899$, $p= 0.006$).

4. Discussion

The study aims to explore the factors that can be used by clinicians for early detection of relapse in patients with psychosis. This may give the treating team the chance to adapt a more preventive approach and deliver selective pre-crisis care to those who need it most before hospital admission becomes inevitable. Previous studies have addressed myriad factors influencing hospital admission for psychotic patients. In our study, three factors were found to be significantly associated with a higher rate of admission in patients with psychosis, namely, CTO, clozapine and forensic history.

The main intention behind the legislation of CTO is to ensure that patients with severe and complex psychiatric disorders are safely treated within the community setting rather than in hospital and thus reduce their naturally high rate of admissions and its subsequent cost (Department of Health and Social Care, 2018). However, our results showed that CTO was contrarily associated with increased total number of admissions, more specifically formal admissions in patients with psychosis. This finding comes in agreement with the results of previous randomized controlled trials and systematic reviews that conclude that CTO does not fulfill the intended effect of reducing the rate or stay of hospital admissions (Burns et al., 2013; Maughan et al., 2014; Rugkåsa, 2016; Rugkåsa & Burns, 2017). Moreover, other studies emphasized that CTO even increases the risk of readmission (Barkhuizen et al., 2020; Kisely et al., 2004) and did not reduce the costs of mental health treatment (Weich et al., 2020). On the other hand, a group of earlier studies showed that CTO reduced the frequency of admissions (Awara et al., 2013; Nakhost et al., 2012; Segal & Burgess, 2006). However, Kisely et al. (2007) rated the general quality of these studies as poor. A systematic review by (Rugkåsa, 2016) explains that the lack of matched control groups in some of these studies render their results liable to regression towards the mean.

The second factor, in our study, that was found to be associated with increased rates of hospital admissions in psychotic patients was being on clozapine medication. This finding contrasts with other studies that report reduced hospital admissions after clozapine initiation (Castro & Elkis, 2007; Kirwan et al., 2019). This could be explained in the light of EPUT policies that mandate inpatient initiation and re-initiation of clozapine (Essex Partnership University Trust, 2021). These policies were based on the high side effect profile of clozapine and the potential life-threatening events associated with its use. However, community initiation under close monitoring has shown promising results and is currently applied in other trusts within the UK and worldwide (Casetta et al., 2020).

Moreover, the results showed that having a positive forensic history was another factor associated with increased rate of formal admissions in patients with psychosis. To our knowledge, this relationship was not directly explored in previous studies. However, our results show that psychotic patients with a positive forensic history had higher rates of formal admissions compared

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to those with no forensic history. This finding may be intuitive as criminal history is one of the strongest static risk factors for future violence (Witt et al., 2013). In addition, hospitals are reluctant to admit violent patients on voluntary basis and would rather detain them under the MHA (Kleespies, 2000).

Using regression analysis, a proposed model predicted 40.3% of the total number of admissions. Forensic history, CTO, clozapine and PBR cluster were found to be risk factors that predicted increased rates of readmission. In contrast, supportive network, psychological intervention and the documentation of early relapse signs were found to be protective factors that predicted lower rates of readmission. We suggest that these variables can be used as a checklist of criteria that enables mental health professionals to objectively rate the risk of readmission in patients with psychosis and thus provide a more intensive care plan to these patients early on.

The COVID-19 pandemic has imposed public health restrictions that changed the face of care. Under these restrictions, telepsychiatry was adopted as new framework to provide patients in the community mental health services with remote support. The past year has witnessed a strong debate against the use of telepsychiatry. Many of the pitfalls of telepsychiatry were highlighted such as difficulty in establishing rapport with the patients as well as missing important cues in mental state examination, e.g., body odour and signs of psychomotor agitation. Thus, it was imperative to explore the impact of these changes in care imposed by the pandemic on the number hospital admissions in patients with psychosis (Khalifa et al., 2008).

In our study, introducing telepsychiatry to the usual face-to-face care was associated with lower number of admissions during the first year of the pandemic compared to patients receiving the usual face-to-face care only. This may emphasize that telepsychiatry has successfully filled in the deficits in face-to-face care that were imposed by the COVID restrictions. These findings are in line with the results from previous studies (Hilty et al., 2013; Monaghesh & Hajizadeh, 2020). Moreover, previous studies have indicated that telepsychiatry was well perceived by both patients (Guinart et al., 2020) and psychiatrists (Olwill et al., 2021). From a different angle, the higher number of admissions in patients receiving face-to-face care could arguably be attributed to the nature and severity of illness of these patients that may hinder their ability to engage with the service remotely. However, the ability of patients with psychosis to engage remotely was explored in previous studies. Patients and their families preferred using digital platforms for communication during the pandemic (Polillo et al., 2021).

Some shortcomings of the study should be noted. First, the modest sample size as well as the data being withdrawn from a single NHS trust with similar geographic distribution undermines the generalizability of the results. Second, this study focuses on socio-demographic and care plan variables associated with relapse. However, socio-economic and clinical factors were not addressed in our study. Third, the impact of telepsychiatry on relapse and hospital admission was only studied during the first year of the COVID-19 pandemic. Further research is required to assess the long term effects of the implementation of telepsychiatry in patients' care.

5. In conclusion, CTO, clozapine use and forensic history were associated with higher risk of hospital admission in patients with psychosis. Whereas, having supportive network, receiving psychological intervention and documentation of early relapse signs were associated with lower risk of admission. Furthermore, preliminary evidence shows that telepsychiatry is a suitable alternative to standard care during the COVID-19 pandemic

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