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Original Article

Duration of Hospitalization According to the Type of Treatment in Patients Diagnosed With Schizophrenia: A Retrospective Cross-sectional Study

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Abstract

Background: Schizophrenia is a complex mental disorder with the most severe and devastating effect on a person's life. Given that schizophrenia treatments have different effects on the duration of hospitalization and reduction of positive and negative symptoms, we decided to conduct a study to evaluate the duration of hospitalization according to the type of treatment in patients diagnosed with schizophrenia in Ebn-e-Sina hospital in Bandar Abbas.

Materials and Methods: In this retrospective descriptive cross-sectional study, the files of 75 patients with schizophrenia admitted to the psychiatric ward of Ebn-e-Sina hospital in 2019-2020 were included after obtaining the approval of the ethics committee. A group of patients was treated with electroconvulsive therapy (ECT) and typical antipsychotic drugs, and another with ECT and atypical antipsychotic medications until the acute phase of the disease subsided. The patient's file information was summarized and arranged in a checklist prepared by the researcher and then statistically analyzed using SPSS version 22.0.

Results: The patients' most commonly received treatment was typical and atypical antipsychotic medications combined with ECT (60.0%), followed by combination therapy (29.30%), atypical antipsychotic medications (8.00%), and typical antipsychotic medications (2.70%), respectively. Considering the specific objectives of this study, it was found that the mean length of hospital stay in the 4 treatment groups was significantly different ($P=0.006$).

Conclusion: The duration of hospitalization in the combined with ECT group was significantly longer compared to the others.

Keywords: Schizophrenia, Hospitalization, Antipsychotic drugs, ECT, Combined therapy

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Introduction

Schizophrenia is a complex mental disorder that exerts the most severe and destructive impact on a person's life (1). Today, as one of the most important and debilitating mental illnesses, it has a special section in all psychiatric and psychological societies of the world. Contrary to the fact that it is examined as a single disease, it includes a series of disorders placed in a heterogeneous group and includes patients whose clinical manifestations, treatment response, and course of the illness differ (1). Schizophrenia affects approximately 1% of the population worldwide. It is characterized by delusions, hallucinations, disturbed speech and behavior, negative symptoms such as withdrawal from social interactions and daily life activities, cognitive impairments, disorganization syndrome, the elevated threshold for the perception of masked visual stimuli, and emotional problems (2-11). According to the diagnostic criteria of Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-5*), the presence of hallucinations or delusions is not necessary for diagnosing the disease. The patient's disorder is diagnosed as schizophrenia when the person has at least two symptoms for a month. During the active stage of the disease, the person's functions are impaired but not necessarily destroyed. Moreover, the general pattern of symptoms related to the disorder should continue for at least six months, but the diagnosis of schizoaffective disorder or mood disorder is not considered for this disorder (11). The average lifetime prevalence of this disease is less than 1%, but regional differences in prevalence are evident due to inequality in urbanization and migration patterns (12).

Although antipsychotic drugs are considered the mainstay of schizophrenia treatment, the complexity of this disease means that no treatment approach alone is sufficient to deal with this multifaceted disorder (13). Despite the effectiveness of these drugs, there are still treatment problems, and the need to use new drug combinations for treatment and reduce the length of hospitalization and the number of relapses in these patients is essential (14) given that a significant number of patients do not have the desired level of productivity after receiving the necessary treatments, which is an indication of the lack of essential therapies (15). Due to its chronic course, this disease is often associated with hospitalization, poor treatment, discharge and recurrence, and re-hospitalization. As a result, the patient's skills and abilities are limited, which damages the person's self-image. Consequently, the life of these patients is at a low level, and their quality of life is affected (16). Besides, this disorder is associated with an increased risk of death and severe economic problems (17). The annual treatment costs of these patients are high. For this reason, the length of stay in the hospital for these people is critical (18). Therefore, in this study, we evaluated the duration of hospitalization according to the type of treatment in patients diagnosed with schizophrenia to determine the shortest length.

Materials and Methods

Participants and Design

This retrospective cross-sectional study was conducted on 75 schizophrenia patients admitted to the neurology department of Ebn-e-Sina hospital, Bandar Abbas, Iran, from March 2019 to March 2020, using the convenience sampling method.

Patients were included in the study based on the inclusion and exclusion criteria. Patients who were referred to Ibn Sina Medical Center with a primary diagnosis of schizophrenia and patients who were treated at Ebn-e-Sina medical center with a final diagnosis of schizophrenia were included in the study. On the other hand, patients who were not admitted for the first time may be excluded from the study because there might be confounding factors and variables. Additionally, patients admitted to the Ebn-e-Sina center with a diagnosis of other psychiatric disorders and all patients with a primary diagnosis of schizophrenia who faced a change in the final diagnosis were excluded from the study. Patients whose file information was incomplete were also excluded from this study. Regarding the age of the patients, both groups were in the same range, and none of them had a physical illness and schizophrenia at the same time. Patients were hospitalized based on the initial diagnosis of the psychiatrist and DSM-5 criteria. A group of patients was treated with electroconvulsive therapy (ECT) and typical antipsychotic drugs, while another group with ECT and atypical antipsychotic medications until the acute phase of the disease subsided and the patients were discharged. In this study, the duration of hospitalization of patients in both groups was measured to reduce the disease burden.

Measurements

Demographic information, type of treatment, duration of hospitalization, family history of psychiatric disorders, history of drug use, and the duration of the disease (under 1 year, between 1 to 5 years, and over 5 years) were extracted from the patient records.

Statistical Analysis

Finally, the collected data were entered into SPSS version 22.0 and analyzed by descriptive statistics (mean and standard deviation of quantitative variables and frequency percentage), Mann-Whitney test, and Chi-square test. ANOVA and LSD post hoc tests were also used. A *P* value of less than 0.05 was considered significant.

Results

A total of 75 schizophrenia patients were analyzed in this study. Among the studied patients, 16 (21.30%) were women, and 59 (78.70%) were men. Additionally, 23 patients (30.70%) had a family history of psychiatric disorders. The most common treatment received by the studied patients was typical and atypical antipsychotic medications combined with ECT (60.00%), followed by combined treatment (29.30%), atypical antipsychotic medications (8.00%), and typical antipsychotic medications (2.70%), respectively. Moreover, 80% of patients had a history of previous hospitalization, and 57.7% had a history of drug use. The mean length of hospitalization of the patients in the last hospitalization was 18.29 ± 8.96 days. Besides, the studied subjects' mean duration of disease was 7.56 ± 7.09 years (Table 1).

The relationship between the duration of hospitalization of patients and the type of treatment of patients was investigated by ANOVA test and then by LSD post hoc test. Based on these tests, the mean duration of hospitalization in the 4 treatment groups was significantly

Table 1. The Distribution of the Findings Related to the Disease of the Studied Subjects

Variable		Number (%)
Type of treatment	Typical	2 (2.70)
	Atypical	6 (8.00)
	Combined	22 (29.30)
	Combined with ECT	45 (60.00)
Previous hospitalization history	No	15 (20.00)
	Yes	60 (80.00)
History of drug use	No	34 (45.30)
	Yes	41 (54.70)

different ($P=0.006$). To find out the difference between the groups, a post hoc test was used, which indicated that the mean duration of hospitalization in the "combined" group was significantly different from the "combined with ECT" group ($P=0.001$). The duration of hospitalization in the combined with ECT group was considerably longer compared with the combined group (Table 2).

The relationship between the duration of hospitalization of patients and the type of treatment of patients according to gender was investigated by ANOVA test and then by LSD post hoc test. Based on the obtained results, the mean duration of hospitalization in the 4 treatment groups in men was significantly different ($P=0.002$). However, the difference in the duration of hospitalization according to the type of treatment in women was insignificant ($P=0.401$). To find out which treatment group was different in men, a post hoc test was used, indicating that the mean duration of hospitalization in the "combined with ECT" group was significantly different from the other two treatment groups ($P=0.036$, $P=0.001$). Therefore, the duration of hospitalization in the combined with ECT group was substantially more prolonged compared with the other two treatment groups (Table 3).

The mean duration of hospitalization in the 4 treatment groups was significantly different in patients with a history of hospitalization ($P=0.002$). However, the difference in length of hospitalization according to the type of treatment was not significant in patients without a history of hospitalization ($P=0.307$) (Table 4). A post hoc test was used to determine which treatment group differed in patients with a history of hospitalization. The mean duration of hospitalization in the "combined with ECT" group was significantly different from the other three treatment groups ($P=0.042$, $P=0.009$, $P<0.01$). Therefore, the duration of hospitalization in the combined with ECT group was significantly longer compared to all three other treatment groups (Table 5).

The relationship between patients' hospitalization duration and the type of treatment according to the family history of psychiatric disorder was investigated by ANOVA test and then by LSD post hoc test. Based on the obtained results, the mean duration of hospitalization in the 4 treatment groups was significantly different in patients without a family history of psychiatric disorders ($P=0.004$). Besides, the difference in the length of hospitalization in patients with a family history of psychiatric disorders was insignificant ($P=0.173$) (Table 6). A post hoc test was used to determine which treatment group differed in the duration of hospitalization in patients without a family history of psychiatric disorders. The mean duration of hospitalization in the "combined with ECT" group had a significant difference compared with the "typical" and "combined" treatment groups ($P=0.045$, $P<0.01$), so the duration of hospitalization in the combined group with

Table 2. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment

Type of Treatment	Mean ± SD	F Statistic	*P* Value
Typical	9.19 ± 13.50	4.491	0.006
Atypical	7.84 ± 16.33		
Combined with ECT	11.19 ± 23.77		
Combined	6.70 ± 16.09		

Table 3. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment According to the Gender of the Patients

Gender	Type of Treatment	Mean ± SD	F Statistic	*P* Value
Female	Typical	13.50 ± 9.19	1.062	0.401
	Atypical	15.00		
	Combined with ECT	18.86 ± 7.49		
	Combined	12.33 ± 5.16		
Male	Atypical	16.60 ± 8.73	6.770	0.002
	Combined with ECT	26.07 ± 12.08		
	Combined	16.67 ± 6.7		

Table 4. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment According to the History of Previous Hospitalization

Hospitalization History	Type of Treatment	Mean ± SD	F Statistic	*P* Value
No	Atypical	23.00	1.304	0.307
	Combined with ECT	11.01 ± 17.17		
	Combined	3.69 ± 12.25		
Yes	Typical	9.19 ± 13.50	5.696	0.002
	Atypical	7.96 ± 15.00		
	Combined with ECT	10.52 ± 26.25		
	Combined	6.94 ± 16.92		

Table 5. The Relationship between the Length of Hospitalization of the Study Subjects and the Type of Treatment in Patients with a History of Previous Hospitalization in Pair with LSD Post Hoc Test

Hospitalization History	Type of Treatment (I)	Type of Treatment (J)	Mean Difference	*P* Value
Yes	Typical	Atypical	-1.500	0.827
		Combined with ECT	-12.750	0.042
		Combined	-3.419	0.567
	Atypical	Typical	1.500	0.827
		Combined with ECT	-11.250	0.009
		Combined	-1.919	0.624
	Combined with ECT	Typical	12.750	0.042
		Atypical	11.250	0.009
		Combined	9.331	<0.01
	Combined	Typical	3.419	0.567
		Atypical	1.919	0.624
		Combined with ECT	-9.331	<0.01

ECT was significantly longer compared with "typical" and "combined" treatment groups (Table 7).

The mean duration of hospitalization in the 4 treatment groups was significantly different in patients with a disease duration of less than one year ($P=0.017$). However, the difference in the duration of hospitalization according to the type of treatment in patients with a disease duration of more than one year was insignificant ($P=0.096$, $P=0.171$). A post hoc test was used to determine the difference in the duration of hospitalization between the treatment groups in patients with a disease duration of less than one year. The mean length of hospitalization in the "combined with ECT" group was significantly different compared with the "combined" treatment group ($P=0.007$). Therefore, the duration of hospitalization in the combined group with ECT was significantly longer compared with the "combined" treatment group (Table 8).

The relationship between the patients' hospitalization duration and the type of treatment of the patients according to the history of drug use was investigated by ANOVA test and then by LSD post hoc test. The mean duration of hospitalization in the 4 treatment groups was significantly different in patients with a history of drug use ($P=0.022$). There was a difference in the duration of hospitalization according to the type of treatment in patients without a history of drug use; however, it was not significant ($P=0.083$). A post hoc test was used to determine which treatment group differed in patients with a history of drug use. The average duration of hospitalization in the "combined with ECT" group was significantly different from the other two treatment groups ($P=0.042$, $P=0.010$). Therefore, the duration of hospitalization in the combined with ECT group was significantly longer compared to the other two treatment groups (Table 9).

Table 6. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment According to the Family History of Psychiatric Disorder

Family History of Psychiatric Disorder	Type of Treatment	Mean ± SD	F Statistic	*P* Value
No	Typical	9.19 ± 13.50	5.120	0.004
	Atypical	3.89 ± 19.20		
	Combined with ECT	10.27 ± 25.14		
	Combined	6.26 ± 16.00		
Yes	Atypical	2.00	1.921	0.173
	Combined with ECT	13.01 ± 21.38		
	Combined	7.82 ± 16.29		

Table 7. The Relationship between the Length of Hospitalization of the Studied Subjects and the Type of Treatment in Pairs, in Patients without a Family History of Psychiatric Disorder

Family History of Psychiatric Disorder	Type of Treatment (I)	Type of Treatment (J)	Mean Difference	*P* value
No	Typical	Atypical	-5.700	0.368
		Combined with ECT	-11.643	0.045
		Combined	-2.500	0.650
	Atypical	Typical	5.700	0.368
		Combined with ECT	-5.943	0.134
		Combined	3.200	0.380
	Combined with ECT	Typical	11.643	0.045
		Atypical	5.943	0.134
		Combined	9.143	<0.01
	Combined	Typical	2.500	0.650
		Atypical	-3.200	0.380
		Combined with ECT	-9.143	<0.01

Discussion

In the present study, the patients' most common treatment was typical and atypical antipsychotic medications combined with ECT (60.00%), followed by combined treatment (29.30%), atypical antipsychotic medications (8.00%), and typical antipsychotic medications (2.70%), respectively.

Considering the specific goals of this study, it was

Table 8. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment According to the Duration of the Disease

The Duration of the Disease	Type of Treatment	Mean ± SD	F Statistic	*P* Value
Under one year	Atypical	19.00 ± 5.65	5.712	0.017
	Combined with ECT	20.80 ± 2.77		
	Combined	12.56 ± 5.12		
Between one and five years	Typical	7.00	2.424	0.096
	Atypical	2.00		
	Combined with ECT	25.00 ± 13.74		
	Combined	17.00 ± 7.93		
Over five years	Typical	20.00	1.785	0.171
	Atypical	19.33 ± 3.78		
	Combined with ECT	24.40 ± 12.50		
	Combined	16.95 ± 6.90		

Table 9. The Relationship between the Duration of Hospitalization of the Studied Subjects and the Type of Treatment According to Drug Use

History of Drug Use	Type of Treatment	Mean ± SD	F Statistic	*P* Value
No	Typical	13.50 ± 9.19	2.449	0.083
	Atypical	17.67 ± 4.61		
	Combined with ECT	22.85 ± 13.07		
	Combined	13.31 ± 6.38		
Yes	Atypical	15.00 ± 11.26	4.218	0.022
	Combined with ECT	25.11 ± 8.29		
	Combined	17.62 ± 6.47		

seen that the mean duration of hospitalization in the 4 treatment groups was significantly different ($P=0.006$), which was consistent with the results of a study by Jia et al (19) However, in our research, the mean duration of hospitalization in the "combined" group was significantly different from the "combined with ECT" group ($P=0.001$).

In our study, in addition to the use of typical and atypical drugs, a higher number of patients had severe conditions compared to other patients, increasing their hospitalization length. On the other hand, since ECT is not usually used as a first-line treatment for these patients from the beginning of hospitalization, typical and atypical drugs are used in the patient first, and if the symptoms do not improve or the patient's condition worsens, it is added to the treatment for this reason. The usefulness of ECT cannot be questioned.

The mean duration of hospitalization in the 4 treatment groups was significantly different in men ($P=0.002$). The difference in the duration of hospitalization according to the type of treatment in women was not significant ($P=0.401$). In the following, it was seen that this significant difference was due to the longer duration of hospitalization in the combined with ECT group, which is due to the higher number of men compared to women in the study, as well as the longer length of hospitalization in the combined with ECT group. However, this result was not investigated in other studies, but it was expected.

The mean duration of hospitalization in the 4 treatment groups was significantly different in patients with a history of hospitalization ($P=0.002$). However, the difference in the duration of hospitalization according to the type of treatment in patients without a history of hospitalization was not significant ($P=0.307$). It was also seen that the mean duration of hospitalization in the "combined with ECT" group was significantly different from all the other three treatment groups ($P=0.042$, $P=0.009$, $P<0.01$). Therefore, the duration of hospitalization in the combined with ECT group was significantly longer compared with all three other treatment groups. This finding was expected due to the severe condition of patients with a history of hospitalization compared to patients without hospitalization.

The mean duration of hospitalization in the 4 treatment groups was significantly different in patients without a family history of psychiatric disorder ($P<0.01$). On the other hand, the difference in the length of hospitalization according to the type of treatment in patients with a family history of psychiatric disorders was insignificant ($P=0.173$). According to the proven direct effect of the family history of psychiatric disorders on the person's illness and its worsening, this finding is justified because in people who have a family history of psychiatric disorders, different treatments do not have a significant difference in the length of their hospitalization, but this is the case for people without a family history.

Additionally, it was seen that the mean duration of hospitalization in the "combined with ECT" group was significantly different from the "typical" and "combined" treatment groups ($P=0.042$, $P<0.01$). The hospitalization time in the combined with ECT group was significantly longer than that in the "typical" and "combined" treatment groups. This finding is also in accordance with the explanations given about the deterioration of the patients treated with ECT, and the non-use of ECT as a first line of treatment for schizophrenia can be interpreted.

Moreover, in this research, it was seen that the average duration of hospitalization in the 4 treatment groups was significantly different in patients with a disease duration of less than one year ($P=0.017$). In contrast, the difference in the duration of hospitalization according to the type of treatment was not significant in patients with a disease duration of more than one year ($P=0.096$, $P=0.171$). It can be stated that as the duration of schizophrenia increases, the person gradually becomes more disabled and his/her condition worsens; consequently, the duration of the hospitalization also increases, which is the characteristic of this disease. On the other hand, it was seen that the mean duration of hospitalization in the "combined with ECT" group was significantly different from the "combined" treatment group ($P=0.007$). The hospitalization duration in the combined with ECT group was substantially more prolonged compared with the "combined" treatment group.

Finally, the mean duration of hospitalization in the 4 treatment groups was significantly different in patients with a history of drug use ($P=0.022$). There was a difference in the length of hospitalization according to the type of treatment in patients without a history of drug use; however, it was not significant ($P=0.083$). The reason for this finding is the direct relationship between drug use and psychiatric disorders, especially psychosis and schizophrenia; in other words, people who use psychotropic drugs have worse conditions than other patients, and their hospitalization period is extended.

Limitations

One of the limitations of this study is the small number of patients diagnosed with schizophrenia who received typical antipsychotic drug treatment alone, which increases the possibility of statistical error in comparing these findings.

Conclusion

The mean length of hospital stay in the 4 treatment groups was significantly different in men, patients with a history of hospitalization, patients without a family history of psychiatric disorder, and patients with a disease duration of less than one year. Furthermore, the duration of hospitalization of the combined with ECT group was

significantly longer compared with the others.

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Authors' Contribution

Conceptualization: Ali Massoudifar.
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Availability of Data and Materials

The data sets used in the current study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare no conflict of interest.

Consent for Publication

Consent for publication was obtained from all participants.

Ethical Approval

This study was approved by the Ethics Committee of Hormozgan University of Medical Sciences (IR.HUMS.REC.1399.321). Furthermore, after obtaining the necessary permissions, the information about schizophrenia patients was extracted from their files.

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