Psikiyatride Güncel Yaklaşımlar-Current Approaches in Psychiatry 2021; 13(Suppl 1):361-374
Doi: 10.18863/pgy.991538

RESEARCH

Effect of Transition to Long-acting Injectable Antipsychotic Treatment on Care Burden in Schizophrenia

Şizofrenide Uzun Etkili Enjektabl Antipsikotik Tedaviye Geçişin Bakım Yükü Üzerine Etkisi

Elif Özcan Tozoğlu [1], Gökhan Özpolat [1],

Abstract

The main aim of this study is to investigate the difference of transition from oral to long-acting antipsychotic treatments on caregiver burden of patients with schizophrenia. Other factors that may be related to the burden were also discussed. Caregivers (n:138) of patients diagnosed with schizophrenia for at least one year and who received oral paliperidone or aripiprazole were included in the study. The Zarit Caregiver Burden Scale (ZCBS) and The Clinical Global Impression-Disease Severity (CGI-S) were administered at baseline and 1 year after switching to long-acting injectables. Demographic characteristics of caregivers and patients were evaluated to determine other factors associated with the burden. Significant decreases were found in the ZCBS and CGI-S scores after transitioning to long-acting injectable antipsychotics. When the groups using paliperidone and aripiprazole were compared; the decrease in ZCBS scores was not significant, the decrease in CGI-S scores was significant.Caregiver burden was positively correlated with patient's age, CGI-S score, time spent in the same house, duration of illness, and the number of hospitalizations. A significant negative correlation was found among the caregiver's age, educational level and income. In conclusion, in the present study the importance of switching to long-acting injectable antipsychotics, which is a modifiable factor, to reduce caregiver burden was emphasized.

Keywords: Schizophrenia, long-acting injection treatment, caregiver, caregiver burden

Öz

Bu çalışmadaki temel amacımız, oral tedaviden uzun etkili antipsikotik tedavilere geçişin şizofreni hastalarında bakım veren yükü üzerinde oluşturduğu farkı araştırmaktır. Yükle ilgili olabilecek diğer faktörler de tartışılmıştır. Çalışmaya en az bir yıldır şizofreni tanısı almış ve oral paliperidon veya aripiprazol alan hastaların bakıcıları (n:138) dahil edildi. Zarit Bakıcı Yükü Ölçeği (ZBYÖ) ve Klinik Global İzlenim-Hastalık Şiddeti (KGİÖ-Ş) ölçeği başlangıçta ve uzun etkili enjektabl antipsikotiklere geçişten 1 yıl sonra uygulandı. Bakım yükü ile ilişkili olabilecek diğer faktörler de ele alındı. Uzun etkili enjekte edilebilir antipsikotiklere geçildikten sonra ZBYÖ ve KGİÖ-Ş puanlarında anlamlı düşüşler bulund. Paliperidon ve aripiprazol kullanan gruplar karşılaştırıldığında; ZBYÖ puanlarındaki düşüş anlamlı değilken, KGİÖ-Ş puanlarındaki düşüş anlamlıydı. Bakım veren yükü, hastanın yaşı, KGİÖ-Ş puanı, aynı evde geçirilen süre, hastalık süresi ve hastaneye yatış sayısı ile pozitif korelasyon gösterdi. Bakım verenin yaşı, eğitim düzeyi ve geliri arasında anlamlı negatif ilişki bulundu. Sonuç olarak bu çalışmada bakım veren yükünün azaltılmasında değiştirilebilir bir faktör olan uzun etkili enjekte edilebilir antipsikotiklere geçilmesinin önemi vurgulanmıştır.

Anahtar sözcükler: Şizofreni, uzun etkili enjektabl antipsikotik tedavi, bakım veren, bakıcı yükü

[1] Erzurum Regional Training and Research Hospital, Erzurum, Turkey
[2] Buhara Private Hospital, Erzurum, Turkey

✉ Elif Özcan Tozoğlu, Erzurum Regional Training and Research Hospital, Psychiatry Clinic, Erzurum, Turkey
drelifozcan@hotmail.com | 0000-0003-2300-2634

Received: 06.09.2021 | Accepted: 12.12.2021 | Published online: 29.12.2021

SCHIZOPHRENIA is a devastating disease with a chronic course that leads to a deterioration in social function in many patients. Many schizophrenic patients are thus unable to fulfill their personal and social responsibilities. The needs of the patients in this regard are met by their caregivers, who are mostly first-degree relatives (Pereira et al. 2007). Patients need to be supported, carefully controlled and protected by caregivers, and predominantly family members. Schizophrenia, therefore, rather than being a disease of the individual, is thus a disease of the family. Due to the associated difficulties, the care required by the patient leads to changes in family dynamics and can lead to stress among the family members who live with the patient (Martinez et al. 2000, Martens and Addington, 2001, Saunders 2003, Ochoa et al. 2008). In fact, caregivers often neglect their own physical and mental health while seeking to maintain a level of balance between patient care and their other responsibilities, such as those related to work and the family (Chan 2011). This overall situation brings the concept of "burden" to the fore for caregivers (Gülseren 2002).

In order to determine appropriate targets for the relief of the burden of caregivers and to develop appropriate methods, the factors related to the burden should first be defined. Studies of burden have tended to focus on social and patient and caregiver-related factors (Zhou et al. 2016). The patient-related features are clinical in nature, and include the type and severity of the patient's symptoms, suicidal ideations and behavioral disorders, although the results of the study show different findings (Wolthaus et al. 2002, McDonell et al. 2003, Reine et al. 2003, Perlick et al. 2006). Factors such as the patient's gender, age, disease severity, cultural factors, stigma, disease duration, disability and socioeconomic status have also been shown to be associated with caregiver burden, (Ohaeri 2001, Awad and Voruganti 2008, Jagannathan et al. 2014) along with the number of disease exacerbations and hospitalizations (Grandón et al. 2008, Aydın et al. 2009).

It is known that antipsychotic drugs reduce the recurrence rate of disease and the number of hospitalizations of the patient (Leucht et al. 2012). Despite the proven benefits of antipsychotics, the rate of non-adherence to treatment is quite high (Gilmer et al. 2004, Higashi et al. 2013). Studies have shown that the majority of patients with schizophrenia (84%) do not continue their oral antipsychotic medication regimes, and 45–50% do not comply with treatment in long-term follow-up (Lacro et al. 2002, Patel et al. 2009). The non-adherence to treatment of patients with schizophrenia is also associated with frequent relapses, an increased number of hospitalizations, and suicidal behaviors (Novick et al. 2010). The high rate of non-adherence to oral antipsychotic treatment has resulted in the development and use of long-acting antipsychotics (Brissos et al. 2014). Many studies have shown that long-acting injections reduce relapse rates, the number of hospitalizations and hospital stay durations, and increase functionality (Schooler 2003b, Lafeuille et al. 2013, Markowitz et al. 2013, Heres et al. 2014, Castillo and Stroup 2015, Yoshimura et al. 2015, Sreeraj et al. 2017). Its impact on caregiver burden, however, has not been sufficiently studied to date.

It is important to reduce the burden of care through the creation of more effective treatment and support programs for patients and their relatives. For this reason it is necessary to determine the factors associated with the burden of care, and to determine treatment strategies that will reduce the burden. Therefore, in our study, it was aimed to investigate the effect of switching from oral antipsychotics to long-acting antipsychotic therapy on the level of caregiver burden of primary caregivers of patients. In addition, other factors that may be associated with burden of care were also discussed.

Method

Involved in the study were patients diagnosed with schizophrenia according to DSM-5 and followed up by the Erzurum Regional Training and Research Hospital Community Mental Health Center (TRSM), and their caregivers. Approval for the study was obtained from the Ethics Committee of the Erzurum Regional Training and Research Hospital on September 7, 2020 with decision number 2020/16-173. Written informed consent was obtained from all the patients and their relatives who agreed to participate in the study. The clinical diagnoses of the patients were made by a psychiatrist. It is planned to switch to long-acting paliperidone pamitate and aripiprazole treatment in patients who are clinically stable with paliperidone and aripiprazole oral treatment and do not use any other psychiatric medication concurrently. On the 9th day of paliperidone palmitate injection and the 15th day of aripiprazole injection, the oral treatment was discontinued in all patients who participated in the study, and long-acting injectable antipsychotic treatment was started. The scales were administered to the patients and their caregivers participating in the study before and one year after the initiation of long-acting antipsychotic treatment.

Sample

Included in the study were patients aged 18–60 being followed up with a diagnosis of schizophrenia for at least one year, who were not experiencing an attack at the time of the study, and who were not diagnosed with any additional organic disease or mental retardation. As caregivers, family members who help the patient's daily functions, conduct medical follow-up and treatment and meet their needs, primarily care about the patient and do not do this as a 'professional job' and voluntarily agree to participate in the study were included. One caregiver for each patient was included in the study. When there was more than one caregiver, the caregiver with the most responsibility was preferred. The criteria for the caregivers included in the study were aged 18–60, no disease or mental retardation that could affect their cognitive or mental functions, and being literate.

Measures

Scales administered to patients

Patient information form

A demographic form was created for the patients admitted to TRSM based on the developed detailed anamnesis form. The form garners data on the patient's age, gender, employment status, history of suicide and forensic event, duration of illness and number of hospitalizations. The patients and their relatives answered the questions related to the number of hospitalizations, duration of disease, history of suicide and forensic events, and their confirmation was made from the files containing the previous data of the TRSM.

Clinical Global Impression Scale (CGIS)

This scale evaluates the severity, the level of recovery and drug side effects of mental disorders. It has 3 subscales that measure disease severity, general recovery and side effects. The disease severity subscale (CGI-S) was used in the present study, scored in a range of 1–7. The higher the score in the scale, the greater the disease severity.

Scales administered to caregivers

Caregiver socio-demographical information form

This includes questions inquiring the caregiver's age, marital status, years of education, income status, and time spent one-on-one with the patient.

Zarit Caregiver Burden Scale (ZCBS)

This scale was developed by Zarit et al. in 1980, and is used to evaluate the level of difficulty experienced by the caregivers in caring for an individual or elderly person in need of care. The scale, which determines the effect of caregiving on the life of the individual, comprises 22 statements that are scored between 0–66, filled out by the caregiver or the researcher. The items on the scale are generally related to the social and emotional domains, with higher scores indicating a greater difficulty experienced by the caregiver. A Turkish validity and reliability study was conducted for this scale(Ozlu ve ark. 2009). The Cronbach's alpha coefficient of the scale was found to be 0.95 (Inci, 2006).

Statistical analysis

The statistical analysis was conducted using IBM SPSS Statistics (Version 26.0. Armonk, NY: IBM Corp.). A Kolmogorov-Smirnov test was used to determine whether the data followed a normal distribution. Data were presented as mean, standard deviation, minimum (min), maximum (max), percentage (%) and number (N). Parametric test conditions could not be met for the data. A Wilcoxon test was used to compare the ZCBS and CGI-S scores before and after the initiation of long-acting injectable therapy. A Mann-Whitney U test was used to compare ZCBS and CGI-S scores of the patient groups treated with Paliperidone Palmitate and long-acting injectable aripiprazole. A Pearson correlation analysis was used to analyze the correlation between caregiver burden and patient and caregiver data. A Mann-Whitney U test was used to assess the burden of care according to the gender and employment status of the patient. A Mann-Whitney U test was used to evaluate the caregiver burden according to gender and marital status, while a Kruskal Wallis test was used to evaluate the burden of care according to work status and degree of closeness. A p value of <0.05 was considered statistically significant. The G*Power 3.1 program was used for the statistical power analysis, a power value of 96% was identified.

Results

The diagnoses, medications, and caregiver status of 723 patients registered with TRSM and who met the inclusion criteria were evaluated, and 152 patients with schizophrenia and their caregivers who met the criteria were included in the study. Of the total, two patients changed cities, one caregiver started treatment with a diagnosis of moderate depressive disorder, three caregivers left home, two caregivers died, three patients were placed in a nursing home and three patients were diagnosed with resistant schizophrenia and were started on clozapine treatment, and were thus excluded from the study. The data of 138 patients who completed the study and their 138 caregivers were evaluated.

Table 1. Characteristics of the patients included in the study

N:138	**Min-Max**	**Mean ± SD**
Age	21-60	42.93±8.84
Duration of the disease (years)	3-45	17.14±11.20
Number of hospitalizations	1-35	7.41±5.28
	N	%
Gender		
Male	69	50
Female	69	50
Employment status		
Unemployed	133	96.4
Student	5	3.6
Suicide history		
No	99	71.7
Yes	39	28.3
Forensic case history		
No	87	63.0
Yes	51	37.0

SD: Standard Deviation

Table 2. Characteristics of caregivers

N:92	**Min-Max**	**Mean ± SD**
Age	20-60	33.39±11.89
Level of education (years)	1-15	6.54±3.82
Duration of Living in the Same House (Years)	3-60	18.85±11.47
Time spent together during the day	8-18	12.96±3.95
Monthly income per capita (TL)	500-2000	1059.78±649.64
	N	%
Gender		
Male	63	45.7
Female	75	54.3
Marital status		
Single	30	21.7
Married	102	73.9
Widow	6	4.3
Employment status		
Unemployed	15	10.9
Works irregularly	15	10.9
Works regularly	66	47.8
Housewife	24	17.4
Retired	18	13.0
The degree of proximity		
Mother/father	33	23.9
Spouse	15	10.9
Siblings	51	37.0
Other	39	28.3

SD: Standard Deviation

Of those included in the study, 50% (n:69) were female and 50% (n:69) were male. Some 74% (n: 102) of the patients transitioned from oral paliperidone treatment to monthly injectable paliperidone palmitate treatment, while 26% (n: 36) transitioned from oral aripiprazole treatment to long-acting monthly aripiprazole injection treatment. Table 1 presents data on the mean duration of illness, the number of hospitalizations, employment status, suicide histories and forensic event histories of the patients. Table-2 presents the demographic data of the caregivers and the average amount of time spent with their patients.

The effect on burden of transitioning from oral antipsychotic therapy to long-acting injectable antipsychotics was evaluated. It was found that switching to long-acting injectable antipsychotics led to a significant decrease in ZCBS and CGI-S scores (p<0.001) (Table 3).

Table 3. Comparison of ZCBS and CGI-S scores before and one year after long-acting antipsychotic use

Scales	Mean ± SD	p value	Z value
ZCBS-1	80.13±11.88	<0.001	-10.182
ZCBS-2	45.24±9.52		
CGI-S-1:	6.46±0.5	<0.001	-10.367
CGI-S-2	3.43±0.65		

ZCBS-1: The Score of Zarit Caregiver Burden Scale in Oral Antipsychotic Treatment; ZCBS-2: The Score of Zarit Caregiver Burden Scale One Year After Starting Long-Acting Antipsychotic Treatment; CGI-S-1 The Score of Clinical Global Impression Severity Scale in Oral Antipsychotic Treatment; CGI-S-2 The Score of Clinical Global Impression Severity Scale One Year After Starting Long-Acting Antipsychotic Treatment

Table 4. Comparison of ZCBS and CGI-S scores according to drug groups

		Paliperidon Palmitate	Aripiprazole
ZCBS-1	Mean ± SD	81±11	79±15
ZCBS-2		46±10	44±9
Point difference		35.09±11.32	34.33±15.68
p value		0.93	
z value		-0,087	
CGI-S-1:	Mean ± SD	6±0	7±1
CGI-S-2		4±1	3±0
Point difference		2.85±0.7	3.5±0.65
p value		<0.001	
z value		-4,529	

SD: Standard Deviation; ZCBS-1: The Score of Zarit Caregiver Burden Scale in Oral Antipsychotic Treatment; ZCBS-2: The Score of Zarit Caregiver Burden Scale One Year After Starting Long-Acting Antipsychotic Treatment; CGI-S-1 The Score of Clinical Global Impression Severity Scale in Oral Antipsychotic Treatment ; CGI-S-2 The Score of Clinical Global Impression Severity Scale One Year After Starting Long-Acting Antipsychotic Treatment

ZCBS and CGI-S scores before and after switching to long-acting injectable antipsychotics were evaluated separately in the groups using paliperidone palmitate and long-acting injectable aripiprazole. The difference in the ZCBS scores of the groups was not statistically significant (p:0.930) (Table 4). The difference in the CGI-S scores of the groups was statistically significant (p<0.001) (Table 4). It was observed that CGI-S scores decreased more in patients on long-acting injectable aripiprazole than in patients using paliperidone palmitate.

A correlation analysis of the burden of care and the characteristics of the patient revealed a significant positive correlation between the burden of care and the CGI-S score, the patient's age, the duration of the disease and the number of hospitalizations (Table 5). An evaluation of the relationship between burden and the patients' demographic variables revealed that the burden of care was not related to the gender of the patient, but was related to employment status (Table 6).

Table 5. Correlation analysis of patient and caregiver data with caregiver burden

	The burden of caregivers	
	r value	**p value**
CGIS-S:	0.182	.033*
Patient Age:	0.430	<0.001
Duration of the Disease	0.742	<0.001
Number of hospitalizations	0.369	<0.001
Age of the Caregiver	-0.268	.001*
Caregiver's years of education	-0.546	<0.001
Monthly income per capita	-0.660	<0.001
Duration of Living in the Same House (Years)	0.489	<0.001
Time spent together during the day	0.696	<0.001

CGI-S: The Score of Clinical Global Impression Severity Scale

Table 6. Comparison of categorical data of patient and caregiver with care burden

Patient's	**ZCBS (Mean ± SD)**	**p**
Gender		0.669
Male	79.7±9.23	
Female	80.57±14.10	
Employment status		<0.001
Unemployed	80.86±11.42	
Student	60.8-±6.57	
Characteristics of the caregiver		
Gender		0.676
Male	79.67±10.38	
Female	80.52±13.07	
Marital Status		<0.001
Single	70.2±7.58	
Married	83.59±11.22	
	ZCBS Mean Rank	
Employment Status		<0.001
Unemployed	30.8	
Works irregularly	91.4	
Works regularly	67.11	
Housewife	55.06	
Retired	111.5	
The degree of proximity		0.037*
Mother-father	56	
Spouse	87.5	
Siblings	75.85	
Other	65.69	

SD: Standard Deviation; ZCBS: The Score of Zarit Caregiver Burden Scale; *p value indicates <0.05.

An evaluation of the relationship between caregiver burden and caregiver characteristics revealed a negative significant relationship between burden and the caregiver's age, the caregiver's education level and the monthly income per capita. Furthermore, a positive significant relationship between burden and the time spent living in the same house between the patient and the caregiver and the time spent together during the day.

The relationship between caregiver burden and the demographic variables of the caregiver was evaluated and revealed no significant relationship between burden and the gender of the caregiver, while burden was significantly higher in the married caregivers and spouses, and highest in the retired caregivers. In terms of burden, no significant difference was identified between caregivers who had no other employment and those who were housewives.

Discussion

Unlike in other studies of this issue, the effect of switching from oral therapy to long-acting injectable antipsychotics on the change in caregiver burden in caregivers of patients with schizophrenia was evaluated in the present study, and other factors that could also affect caregiver burden were also discussed.

It was found in the present study that switching from oral antipsychotic treatment to long-acting injectable antipsychotics significantly reduced caregiver burden, which is a factor that can be easily changed by healthcare professionals, unlike other factors. Changing this factor can also have a positive effect on other factors related to burden, such as the number of hospitalizations and the recurrence rate, and the burden decreases in a multifactorial manner.

Studies have shows that despite the benefits brought by antipsychotics to the treatment of schizophrenia, the rate of non-adherence to treatment is high (Gilmer et al. 2004, Higashi et al. 2013). Non-compliance with treatment, which is common in clinical practice, is a significant problem that may lead to rehospitalization (Çobanoğlu et al. 2003). Some 50% of patients discontinue oral antipsychotic treatment in the first year following discharge, and treatment compliance is 30% less in the second year (Waddell and Taylor 2009). The use of long-acting antipsychotics in schizophrenia provides an advantage in terms of adherence to treatment and the continuation of effective treatment (Ceylan et al. 2017). The rate of relapse in first episode schizophrenia is 70% in non-adherent patients and 25% in treatment-compliant patients (Patel and David 2005, Olfson et al. 2007). In another study, the relapse rate at one-year follow-up was 42% in those using oral antipsychotics, and 27% in those using long-acting injectable antipsychotics (Schooler 2003). A significant difference was found between the use of oral drugs and long-acting injectable therapy in terms of the number of days of hospitalization (Bhanji et al. 2004).

It has been reported by caregivers that the rate of drug non-adherence is high in patients with schizophrenia, and poor adherence to antipsychotics is associated with the burden of care(Kretchy et al. 2018). There have been studies associating long-acting injectable antipsychotics with better treatment compliance (De Marinis et al. 2007, Marcus et al. 2015, McCreath et al. 2017, Titus-Lay et al. 2018). In the light of this information, it can be concluded that long-acting antipsychotic treatment can reduce the burden of care by increasing treatment compliance. In the present study, it was found that switching from oral antipsychotic treatment to long-acting injectable antipsychotics significantly reduced caregiver burden.

When long-acting injectable aripiprazole and paliperidone palmitate were evaluated separately, no superiority of one over the other was identified in terms of care burden, although long-acting aripiprazole lowered the CGI-S scores more than palperidone palmitate. Although there has been no study to date comparing long-acting aripiprazole and paliperidone palmitate in terms of efficacy, studies have shown that long-acting aripiprazole improves both clinical symptoms and functionality, like other long-acting second-generation antipsychotics (Kane et al. 2014). A further study evaluating quality of life reported that long-acting aripiprazole provides better clinical outcomes than paliperidone palmitate, (Naber et al. 2015) although the study was limited by the small sample size of those on long-acting aripiprazole. Studies conducted with larger samples with the primary goal of comparing drug efficacy will be more enlightening in this respect.

An analysis of previous studies evaluating the relationship between the gender of the caregiver and the burden reveals that patient care is generally performed by women (Nolan 2001, Cassidy et al. 2001, Cheng and Chan 2005, Awad and Voruganti 2008, Chan et al. 2009, Nasr and Kausar 2009, Gülseren et al. 2010, Hulya and Adana 2011, Adeosun 2013, Caqueo-Urízar et al. 2016, Kretchy et al. 2018). Similarly, the caregivers in the present study were mostly women. It has been reported that the cultural structure of societies may be influential in this regard. Relations in the traditional family structure are closer than in the modern family structure, and it is seen that patient care is generally undertaken by the mothers (Gülseren et al. 2010). Considering the geography of our study and our country, in which the traditional family structure is dominant, women generally take care of patients in cases of chronic disease (Hacialioglu et al. 2010).

In terms of caregiver burden, no difference was found between male and female caregivers in the present study. In an analysis of previous studies of caregiver burden, the burden tends to be higher in female caregivers, (Cassidy et al. 2001, Jungbauer et al. 2002, Montero et al. 2006, Gülseren et al. 2010) although there are some studies that report on difference in this regard(Caqueo-Urízar and Gutiérrez-Maldonado 2006, Aydın et al. 2009,). In studies conducted in our country, besides the studies in which the burden is reported to be higher in female caregivers, there are also studies in which there is no difference in the burden. In terms of sample size, although the sample in the present study is larger than in many studies, the garnered data is compatible with a previous study (Aydın et al. 2009) involving a smaller sample sizes, but not with a study involving a larger sample size (Gülseren et al. 2010). It is thought as the sample size increases, so does the reported burden on women.

Consistent with most studies in literature, no relationship was found between caregiver burden and patient gender (Caqueo-Urízar and Gutiérrez-Maldonado 2006, Aydın et al. 2009). In the present study a positive significant relationship was found between patient age and burden. An analysis of literature reveals a significant relationship between burden and patient age in some studies, (Aydın et al. 2009) while no such relationship between burden and patient age is identified in other studies (Gutiérrez-Maldonado and Caqueo-Urízar 2007, Zhou et al. 2016). This result may be expected, given that even healthy people get older, and their diseases increase the burden on their families.

A significant negative correlation was found between burden and the age of the caregiver. An analysis of literature reveals that while burden increases with the age of the caregiver in Asian countries, it decreases in countries such as the United States and Mexico (Chien et al. 2007, Magaña et al. 2007, Chan 2011). In contrast to the findings of the present study, a previous study conducted in our country reported that burden increased with the age of the caregiver (Yazici et al. 2016). However, our findings are consistent with the findings of a study conducted with the caregiver parents of individuals with mental illness (Cook et al. 1994, Magaña and Smith 2006). It is thought that this may be related to the fact that younger caregivers have more social roles than older people, such as having a job, raising children and caring for aging parents. Another explanation may be that elderly caregivers have more experience in accepting the disease and the sick individual and developing coping strategies.

Although the results of previous studies disagree when it comes to the education level of the patient's relatives and the caregiver burden, the results obtained in the present study were found to be compatible with a study conducted previously in our country. In the present study it has been shown that the caregiver burden decreases as the length of education of the caregiver increases. It is thought that as the education level increases, the change in people's perspective on psychiatric diseases and the change in the level of stigma may have an effect on the decrease in the burden of caregivers (Coşkun and Güven Caymaz 2012). However, this can be demonstrated more objectively in a study evaluating the effect of stigma on caregiver burden.

In our study, it has been shown that the burden of caregivers decreases with the increase in the monthly income level and the decrease in the time spent with the patient. This result was also found to be compatible with other studies conducted in our country (Yazici et al. 2016). It is thought that low income level makes it difficult to access health services and meet basic care needs in the follow-up and treatment of the disease, which will increase the burden of caregivers. In addition, the decrease in access to social and cultural areas and the increase in the time spent with the patient may create the perception of an increase in burden.

In the evaluation of the working status of the patients, it was seen that many patients were not working, but there was a significant difference in terms of caregiver burden between the students and non-working patients, and the caregiver burden of the relatives of the patients who were students was significantly lower. It is thought that this situation arises from the necessity of having a certain level of functionality in order to maintain studentship. In addition, since the education period during the day provides the caregiver with partial time independent of the patient, the burden of the student patients on their caregivers may contribute to this situation.

In our study, it was found that the disease duration and the number of hospitalizations had a positive relationship with burden. It is seen that there is consistency between the previous studies on this subject and the findings of our study (Aydın et al. 2009, Gülseren et al. 2010, Yazici et al. 2016).

Patients with more than one caregiver were also included in the study, but the effect of the number of caregivers on the burden of care was not evaluated. In addition, participants in this study were selected from TRSM. It has been reported that insight, adherence to treatment and functionality increase as the frequency of participation in TRSM increases (Sahin et al. 2020). Therefore, it is thought that the frequency of participation is a factor that may indirectly affect the caregiver burden. However, the fact that this factor has not been addressed constitutes a limitation for our study. Other limitations of our study are that it is single-centered and the sample size is relatively small.

Conclusion

Despite the advantages of long-acting antipsychotic injections, it is seen that the rate of treatment of psychotic patients with such drugs is low due to national and regional differences all over the world (Rothbard et al. 2003). The results of our study support that the use of long-acting antipsychotics may contribute to a reduction in the burden of care.

References

Adeosun II (2013) Correlates of caregiver burden among family members of patients with schizophrenia in Lagos, Nigeria. Schizophr Res Treat, 2013:15-21.

Awad AG, Voruganti LN (2008) The burden of schizophrenia on caregivers. Pharmacoeconomics, 26:149-162.

Aydin A, Eker SS, Cangür Ş, Sarandöl A, Kirli S (2009) Şizofreni hastalarında bakım veren külfet düzeyinin, sosyodemografik değişkenler ve hastalığın özellikleri ile ilişkisi. Noro Psikiyatri Ars, 46:10-14

Bhanji NH, Chouinard G, Margolese HC (2004) A review of compliance, depot intramuscular antipsychotics and the new long-acting injectable atypical antipsychotic risperidone in schizophrenia. Eur Neuropsychopharmacol, 14:87-92.

Brissos S, Veguilla MR, Taylor D, Balanzá-Martinez V (2014) The role of long-acting injectable antipsychotics in schizophrenia: a critical appraisal. Ther Adv Psychopharmacol, 4:198-219.

Caqueo-Urízar A, Gutiérrez-Maldonado J (2006) Burden of care in families of patients with schizophrenia. Qual Life Res, 15:719-724.

Caqueo-Urízar A, Urzúa A, Jamett PR, Irarrazaval M (2016) Objective and subjective burden in relatives of patients with schizophrenia and its influence on care relationships in Chile. Psychiatry Res, 237:361-365.

Cassidy E, Hill S, O'callaghan E (2001) Efficacy of a psychoeducational intervention in improving relatives' knowledge about schizophrenia and reducing rehospitalisation. Eur Psychiatry, 16:446-450.

Castillo EG, Stroup TS (2015) Effectiveness of long-acting injectable antipsychotics: a clinical perspective. Evid Based Ment Health, 18:36-39.

Ceylan MF, Erdogan B, Hesapcioglu ST, Cop E (2017) Effectiveness, adverse effects and drug compliance of long-acting injectable risperidone in children and adolescents. Clin Drug Investig, 37:947-956.

Chan SW-c (2011) Global perspective of burden of family caregivers for persons with schizophrenia. Arch Psychiatr Nurs, 25:339-349.

Chan SW-c, Yip B, Tso S, Cheng B-s, Tam W (2009) Evaluation of a psychoeducation program for Chinese clients with schizophrenia and their family caregivers. Patient Educ Couns, 75:67-76.

Cheng LY, Chan S (2005) Psychoeducation program for Chinese family carers of members with schizophrenia. West J Nurs Res, 27:583-599.

Chien WT, Chan SW, Morrissey J (2007) The perceived burden among Chinese family caregivers of people with schizophrenia. J Clin Nurs, 16:1151-1161.

Cook JA, Lefley HP, Pickett SA, Cohler BJ (1994) Age and family burden among parents of offspring with severe mental illness. Am J Orthopsychiatry, 64:435-447.

Coşkun S, Güven Caymaz N (2012) Bir Kamu ve özel psikiyatri hastanesine başvuran hastaların içselleştirilmiş damgalanma düzeyi yönünden karşılaştırılması. Psikiyatri Hemsireleri Dergisi, 3:121-128.

Çobanoğlu ZSÜ, Aker T, Çobanoğlu N (2003) Şizofreni ve diğer psikotik bozukluğu olan hastalarda tedaviye uyum sorunları. Dusunen Adam, 16:211-218.

De Marinis T, Saleem P, Glue P, Arnoldussen W, Teijeiro R, Lex A et al. (2007) Switching to long-acting injectable risperidone is beneficial with regard to clinical outcomes, regardless of previous conventional medication in patients with schizophrenia. Pharmacopsychiatry, 40:257-263.

Gilmer TP, Dolder CR, Lacro JP, Folsom DP, Lindamer L, Garcia P et al. (2004) Adherence to treatment with antipsychotic medication and health care costs among Medicaid beneficiaries with schizophrenia. Am J Psychiatry, 161:692-699.

Grandón P, Jenaro C, Lemos S (2008) Primary caregivers of schizophrenia outpatients: Burden and predictor variables. Psychiatry Res, 158:335-343.

Gutiérrez-Maldonado J, Caqueo-Urízar A (2007) Effectiveness of a psycho-educational intervention for reducing burden in Latin American families of patients with schizophrenia. Qual Life Res, 16:739-747.

Gülseren L (2002) Schizophrenia and the family: difficulties, burdens, emotions, needs. Turk Psikiyatri Derg, 13:143-151.

Gülseren L, Cam B, Karakoç B, Yiğit T, Danacı A, Çubukçuoğlu Z et al. (2010) The perceived burden of care and its correlates in schizophrenia. Turk Psikiyatri Derg, 21:203-212.

Hacialioglu N, Özer N, Erdem N, Erci B (2010) The quality of life of family caregivers of cancer patients in the East of Turkey. Eur J Oncol Nurs, 14:211-217.

Heres S, Lambert M, Vauth R (2014) Treatment of early episode in patients with schizophrenia: the role of long acting antipsychotics. Eur Psychiatry, 29:1409-1413.

Higashi K, Medic G, Littlewood K J, Diez T, Granström O, De Hert M (2013) Medication adherence in schizophrenia: factors influencing adherence and consequences of nonadherence, a systematic literature review. Ther Adv Psychopharmacol, 3:200-218.

Arslantaş H, Adana F (2011) Şizofreninin bakım verenlere yükü. Psikiyatride Güncel Yaklaşımlar, 3:251-277.

İnci FH (2006) Bakım Verme Ölçeğinin Türkçe'ye uyarlanması, geçerlilik, güvenirliği. (Yüksek Lisans Tezi). Denizli, Pamukkale Üniversitesi.

Jagannathan A, Thirthalli J, Hamza A, Nagendra H, Gangadhar B (2014) Predictors of family caregiver burden in schizophrenia: Study from an in-patient tertiary care hospital in India. Asian J Psychiatry, 8:94-98.

Jungbauer J, Mory C, Angermeyer M (2002) Does caring for a schizophrenic family member increase the risk of becoming ill? Psychological and psychosomatic troubles in caregivers of Schizophrenia patients. Fortschr Neurol Psychiatr, 70:548.

Kane J M, Peters-Strickland T, Baker R A, Hertel P, Eramo A, Jin N et al. (2014) Aripiprazole once-monthly in the acute treatment of schizophrenia: findings from a 12-week, randomized, double-blind, placebo-controlled study. J Clin Psychiatry, 75:1254-1260.

Kretchy IA, Osafo J, Agyemang SA, Appiah B, Nonvignon J (2018) Psychological burden and caregiver-reported non-adherence to psychotropic medications among patients with schizophrenia. Psychiatry Res, 259:289-294.

Lacro JP, Dunn LB, Dolder CR, Jeste DV (2002) Prevalence of and risk factors for medication nonadherence in patients with schizophrenia: a comprehensive review of recent literature. J Clin Psychiatry, 63:892-909.

Lafeuille MH, Laliberté-Auger F, Lefebvre P, Frois C, Fastenau J,Duh MS (2013) Impact of atypical long-acting injectable versus oral antipsychotics on rehospitalization rates and emergency room visits among relapsed schizophrenia patients: a retrospective database analysis. BMC Psychiatry, 13:221.

Leucht S, Tardy M, Komossa K, Heres S, Kissling W, Salanti G et al. (2012) Antipsychotic drugs versus placebo for relapse prevention in schizophrenia: a systematic review and meta-analysis. Lancet, 379:2063-2071.

Magaña S, Smith MJ (2006) Health outcomes of midlife and older Latina and Black American mothers of children with developmental disabilities. Ment Retard, 44:224-23.

Magaña SM, Ramirez Garcia JI, Hernández MG, Cortez R (2007) Psychological distress among Latino family caregivers of adults with schizophrenia: The roles of burden and stigma. Psychiatr Serv, 58:378-384.

Marcus SC, Zummo J, Pettit AR, Stoddard J, Doshi JA (2015) Antipsychotic adherence and rehospitalization in schizophrenia patients receiving oral versus long-acting injectable antipsychotics following hospital discharge. J Manag Care Spec Pharm, 21:754-769.

Markowitz M, Fu DJ, Levitan B, Gopal S, Turkoz I,Alphs L (2013) Long-acting injectable paliperidone palmitate versus oral paliperidone extended release: a comparative analysis from two placebo-controlled relapse prevention studies. Ann Gen Psychiatry, 12:22.

Martens L, Addington J (2001) The psychological well-being of family members of individuals with schizophrenia. Soc Psychiatry Psychiatr Epidemiol, 36:128-133.

Martinez A, Nadal S, Beperet M, Mendióroz P (2000) The schizophrenic patient and his/her relatives: a process of deep change. An Sist Sanit Navarra, 23:101-110.

McCreath J, Larson E, Bharatiya P, Labanieh HA, Weiss Z, Lozovatsky M (2017) Long-acting injectable antipsychotics for schizophrenia: sociodemographic characteristics and treatment adherence. Prim Care Companion CNS Disord, 19: doi: 10.4088/PCC.16m02005..

McDonell MG, Short RA, Berry CM, Dyck DG (2003) Burden in schizophrenia caregivers: impact of family psychoeducation and awareness of patient suicidality. Fam Process, 42:91-103.

Montero I, Masanet M, Lacruz M, Bellver F, Asencio A, García E (2006) Family intervention in schizophrenia: long-term effect on main caregivers. Actas Esp Psiquiatr, 34:169-174.

Naber D, Hansen K, Forray C, Baker R A, Sapin C, Beillat M et al. (2015). Qualify: a randomized head-to-head study of aripiprazole once-monthly and paliperidone palmitate in the treatment of schizophrenia. Schizophr Res, 168:498-504.

Nasr T, Kausar R (2009) Psychoeducation and the family burden in schizophrenia: a randomized controlled trial. Ann Gen Psychiatry, 8:17.

Nolan M (2001) Supporting family carers in the UK: overview of issues and challenges. Br J Nurs, 10:608-613.

Novick D, Haro JM, Suarez D, Perez V, Dittmann RW, Haddad PM (2010) Predictors and clinical consequences of non-adherence with antipsychotic medication in the outpatient treatment of schizophrenia. Psychiatry Res, 176:109-113.

Ochoa S, Vilaplana M, Haro JM, Villalta-Gil V, Martínez F, Negredo MC et al. (2008) Do needs, symptoms or disability of outpatients with schizophrenia influence family burden? Soc Psychiatry Psychiatr Epidemiol, 43:612-618.

Ohaeri JU (2001) Caregiver burden and psychotic patients' perception of social support in a Nigerian setting. Soc Psychiatry Psychiatr Epidemiol,36:86-93.

Olfson M, Marcus SC, Ascher-Svanum H (2007) Treatment of schizophrenia with long-acting fluphenazine, haloperidol, or risperidone. Schizophr Bull, 33:1379-1387.

Ozlu A, Yildiz M, Aker T (2009) A reliability and validity study on the Zarit caregiver burden scale. Noro Psikiyatri Ars, 46:38-42.

Patel MX, David AS (2005) Why aren't depot antipsychotics prescribed more often and what can be done about it? Adv Psychiatr Treat, 11:203-211.

Patel MX, Taylor M, David AS (2009) Antipsychotic long-acting injections: mind the gap. Br J Psychiatry, 195:1-4.

Pereira MAO, Barbieri L, Paula VP, Franco M (2007) Mental health in the family health program: the conceptions of community agents about mental illness. Rev Esc Enferm USP, 41:567-572.

Perlick DA, Rosenheck RA., Kaczynski R, Swartz MS, Cañive JM, Lieberman JA (2006) Special section on CATIE baseline data: components and correlates of family burden in schizophrenia. Psychiatr Serv, 57:1117-1125.

Reine G, Lancon C, Simeoni M, Duplan S, Auquier P (2003) Caregiver burden in relatives of persons with schizophrenia: an overview of measure instruments. L'encéphale, 29:137.

Rothbard AB, Kuno E, Foley K (2003) Trends in the rate and type of antipsychotic medications prescribed to persons with schizophrenia. Schizophr Bull, 29:531-540.

Sahin S, Elboga G, Altindag A (2020) The effects of the frequency of participation to the community mental health center on insight, treatment adherence and functionality. Klinik Psikiyatri Dergisi, 23:64-71.

Saunders JC (2003) Families living with severe mental illness: A literature review. Issues Ment Health Nurs, 24:175-198.

Schooler NR (2003) Relapse and rehospitalization: comparing oral and depot antipsychotics. J Clin Psychiatry, 64:14-17.

Sreeraj VS, Shivakumar V, Rao NP, Venkatasubramanian G (2017) A critical appraisal of long acting injectable antipsychotics: translating research to clinics. Asian J Psychiatr, 28:57-64.

Titus-Lay EN, Ansara ED, Isaacs AN, Ott CA (2018) Evaluation of adherence and persistence with oral versus long-acting injectable antipsychotics in patients with early psychosis. Ment Health Clin, 8:56-62.

Waddell L, Taylor M (2009) Attitudes of patients and mental health staff to antipsychotic long-acting injections: systematic review. Br J Psychiatry, 195:43-50.

Webb C, Pfeiffer M, Mueser KT, Gladis M, Mensch E, DeGirolamo J et al. (1998) Burden and well-being of caregivers for the severely mentally ill: The role of coping style and social support. Schizophr Res, 34:169-180

Wolthaus JE, Dingemans PM, Schene AH, Linszen DH, Wiersma D, Van Den Bosch R J et al. (2002) Caregiver burden in recent-onset schizophrenia and spectrum disorders: the influence of symptoms and personality traits. J Nerv Ment Dis , 190:241-247.

Yazici E, Karabulut Ü, Yildiz M, Tekeş SB, Inan E, Çakir U et al. (2016) Burden on caregivers of patients with schizophrenia and related factors. Noro Psikiyatri Ars, 53:96-101.

Yoshimura B, Shinkawa I, Konishi A (2015) Hospitalization risk in patients with schizophrenia before and after initiation of risperidone long-acting injection in Japan. Asian J Psychiatr, 14:67.

Zhou Y, Ning Y, Rosenheck R, Sun B, Zhang J, Ou Y et al. (2016) Effect of living with patients on caregiver burden of individual with schizophrenia in China. Psychiatry Res, 245:230-237.

Authors Contributions. Authors attest that they have made an important scientific contribution to the study and have assisted with the drafting or revising of the manuscript.
Peer-review: Externally peer-reviewed.
Ethical Approval: Ethical approval was obtained from Erzurum Regional Training and Research Hospital Ethics Committee for the study. All participants gave informed consent.
Conflict of Interest: No conflict of interest was declared by the authors.