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The investigation of the relationship between blood parameters, sleep quality, and quality of life of patients using depot antipsychotics

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Abstract

Aim: In our study, we aimed to examine the relationship between laboratory tests with sleep and quality of life in patients using depot antipsychotics as monotherapy for the last three months.

Materials and Methods: Patients with schizophrenia and receiving monotherapy depot antipsychotic form were included in our study. Calgary Depression in Schizophrenia Scale (CSS), Positive and Negative Syndrome Scale (PANSS), Pitssburg Sleep Quality Index (PUKİ), Scale of Short Form-36 (SF-36) were administered. The laboratory parameters of the participants were evaluated.

Results: Sixty one to study; 80.3% male and 19.7% female patients were included. The mean age of all patients was 36.40±9.96, and the mean body mass index was 24.49±5.18. There was no significant difference between the groups in terms of PSQI subscales and total scores ($p>0.05$). Only the social functioning score for SF-36 was worse than the other two groups of patients using zuclopenthixol depot ($p=0.049$). There was no difference between the groups in SF-36 other subscale scores ($p<0.05$). Prolactin value and other laboratory parameters were also not different between groups ($p>0.05$).

Conclusion: Based on the results we have obtained, general functionality levels such as sleep and quality of life of the patients should be considered while determining the depot antipsychotic forms. In order to generalize and interpret the findings of our study, there is a need to conduct studies involving larger sample groups and different periods of the disease.

Introduction

Schizophrenia is a disabling condition impacting approximately 1% of the worldwide population. Schizophrenia occurs more commonly in men. Symptoms include positive symptoms (eg, hallucinations, delusions), negative symptoms (eg, avolition, anhedonia), and cognitive impairment. There are likely many different environmental and pathophysiologic etiologies involving distinct neurotransmitters and neurocircuits. Treatment requires a combination of pharmacological and psychosocial interventions. Supportive psychosocial treatments can work in tandem with antipsychotic medications and optimize patient care. Unfortunately, there has been no significant advances inthe pharmacological treatment of psychosis over recentdecades. However, incremental improvement has occurred with theintroduction of newer antipsychotic medications providing a wider choice of medications [1].

Depot antipsychotic drugs have an important place to treat chronic mental diseases such as schizophrenia, schizoaffective disorder, delusional disorder, and bipolar affective disorder [2]. Advantages such as decreasing hospitalizations, ensuring treatment compliance, ease of prescription, consistent blood concentration, and low risk of overdose are the reasons for their preference [3]. It is reported in recent studies that depot antipsychotic drugs can be preferred first-line in all psychotic patients, including the first episode [4]. In the literature, the results obtained in previous studies comparing depot drug forms with oral drug forms in terms of the number of hospitalizations, frequency, and treatment remission are inconsistent. Although no difference was detected in some studies, some reported that the depot forms were superior [5-9]. A clear superiority of drug forms over each other could not be demonstrated when different depot antipsychotic forms were compared [10, 11]. Drug selection among depot antipsychotics is made according to the side effect profile [11]. In a meta-analysis study that was conducted in the literature, it was shown that the severity of the disease, disrup-

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tion in the sleep-wake cycle because of the disease, changes in appetite, metabolic problems, and prolactin levels are effective in the choice of drugs in addition to the clinical experience of the physician [12]. There are few studies investigating the effects of depot antipsychotics on the quality of life and sleep quality of patients with schizophrenia in the literature [13]. Therefore, we planned to investigate this issue in our study. We think that these data might contribute to clinicians' selection of depot antipsychotic drugs in their patients.

Although antipsychotics have provided a substantial improvement in the treatment of psychosis and well-being of patients, it is also known that they cause many side effects that affect the quality of life of patients and can disturb the patient. These drugs have side effects such as sedation, drowsiness, hypotension, dizziness, headache, extrapyramidal symptoms, pseudoparkinsonism (small stride, decrease in mimics, and slowdown in movements), and tremor. The importance of the effects of these drugs on the quality of life and sleep of psychotic patients is gradually increasing [14]. Therefore, we examined such as components general health, physical functioning, role physical, role emotional, vitality, mental health, social functioning for quality of life in patients, and subjective sleep quality, sleep latency, sleep duration, use of sleeping medication, daytime dysfunction for sleep quality in patients. The present study is the first in which the side effects of depot antipsychotic drug forms are evaluated with separate forms. The purpose of the present study was to compare the quality of life, sleep quality, and laboratory parameters of the patients using depot antipsychotics (depot zuclopenthixol, depot risperidone, and depot paliperidone) as monotherapy.

Materials and Methods

Participants

Patients who were diagnosed with schizophrenia according to DSM-5 Criteria, who were hospitalized in Fethi Sekin City Hospital or were followed up in the outpatient clinic, were recruited in the study. Diagnosis of patients with schizophrenia was confirmed by the same psychiatrist, who is an expert in the field, through a the structured clinical interview (SCID) according to DSM-5 criteria. Those who had received depot antipsychotic therapy for the last three months as monotherapy were interviewed. Then, the Positive and Negative Syndrome Scale (PANNS), Calgary Depression in Schizophrenia Scale (CSDS), Pitsburg Sleep Quality Scale (PSQS), and Quality of Life Scale (SF-36) were filled. The sample size was not calculated because patients with schizophrenia who received monotherapy with one of the antipsychotics zuclopenthixol, risperidone and paliperidone for the last three months and met the inclusion criteria were included in the study.

The collection of 61 patients who received monotherapy took approximately two years. Patients who came to the general psychiatry outpatient clinic for regular check-ups, were consulted to our outpatient clinic, and were hospitalized in our high-security forensic psychiatry service were included in the study. The antipsychotic treatments of the patients were started by different doctors in order to reduce selection bias in the study. The patients were informed about the study and their verbal and written consents were obtained. The application and evaluation of the scales were done by the same psychiatrist. The scale filling process was completed in an average of 45 minutes. After the scales were filled, the results of the scales and blood test results were transferred to electronic media by the same psychiatrist on the same day, the records were kept regularly, thus reducing possible errors and missing data. Patients with lack of education, mental retardation, neurodegenerative disease, dementia, acute attack, poor general condition, who would prevent obtaining written consent and application of the scales, were not included in the study. Patients with chronic liver, lung, kidney, and heart disease in addition to schizophrenia were excluded from the study because it may affect the quality of life and laboratory values. In addition, patients with diseases that may increase prolactin level such as pregnancy period or intracranial mass were not included in the study. Also, patients with alcohol/substance use disorder were excluded from the study. Permission for the study was obtained from the Ethics Committee of Fırat University with the number E-97132852-050.01.04-154731.

Data collection tools

A written consent form was signed by all participants at the first psychiatric interviews and a sociodemographic data form was applied by the researcher. Then, the Positive and Negative Syndrome Scale (PANNS), Calgary Depression in Schizophrenia Scale (CSDS), Pittsburg Sleep Quality Scale (PSQS), and Quality of Life Scale (SF-36) were filled.

Demographic data form

The form was created by researchers and included clinical evaluation questions and demographic data such as age, marital status, education level, disease duration, whether the patient had inpatient treatment, and whether the patient had alcohol/substance use.

Positive and Negative Syndrome Scale (PANSS)

The Turkish validity and reliability study of the form which was developed by Kay et al. was conducted for Turkey [15, 16]. The scale has mostly been used to inventory, grade and follow the symptoms in schizophrenia. It quantifies positive symptoms, which refer to an excess or distortion of normal functions (e.g., hallucinations and delusions), and negative symptoms, which represent a diminution or loss of normal functions. The scale consists of 7 items assessing positive symptoms, seven items assessing negative symptoms, and 16 items assessing the general psychopathology level. The PANSS is composed of 3 subscales: Positive Scale, Negative Scale, and General Psychopathology Scale. Each subscale is rated with 1 to 7 points ranging from absent to extreme. The range for the Positive and Negative Scales is 7-49, and the range for the General Psychopathology Scale is 16-112. The total PANSS score is simply the sum of the sub scales. In addition to these measures, a Composite Scale is scored by subtracting the negative score from the positive score. Cut

off scores of 18 for positive scale, 21 for negative scale and 38 for general psychopathology were determined.

Calgary Depression Scale in Schizophrenia (CDS)

It was developed by Addington et al. and adapted into Turkish by Oksay et al. [17, 18]. The Calgary Depression Scale for Schizophrenia is a nine item structured interview scale that was designed in 1990 specifically to assess depression independently of symptoms of psychosis in schizophrenia. It is the only depression scale designed to assess depression in people with schizophrenia. It distinguishes depressive symptoms from negative positive and extrapyramidal symptoms. The scale works in both relapsed and remitted patients and is sensitive to change. It is valid in adolescents and adults. Reviewers describe it as the gold standard measure for assessing depression in schizophrenia. The CDS consists of eight structured questions and a ninth observational item that depends on observation over the course of the interview. Items were constructed to measure: 1. Depression; 2. Hopelessness; 3. Self-deprecation; 4. Guilty ideas; 5. Pathological guilt; 6. Morning depression; 7. Early wakening; 8. Suicidal ideation; and 9. Observed depression. Items are graded on a 4-point Likert type scale (0, absent; 1, mild; 2, moderate; 3, severe), anchored by descriptors (Donald Addington et al., 1992). Point scores of all nine items are summed to obtain the CDS depression score. A score higher than 6 has an 82% specificity and 85% sensitivity for predicting the presence of a major depressive episode.

Pittsburgh Sleep Quality Index (PSQI)

The scale consists of nineteen questions and is used to evaluate the subjective sleep quality of patients with 7 subdimensions. High scores indicate poor sleep quality. It was developed by Buysse et al. and adapted into Turkish by Ağargün et al. [19, 20]. Consisting of 19 items, the PSQI measures several different aspects of sleep, offering seven component scores and one composite score. The component scores consist of subjective sleep quality, sleep latency (i.e., how long it takes to fall asleep), sleep duration, habitual sleep efficiency (i.e., the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication, and daytime dysfunction. As psychiatric disorders are often associated with sleep disturbances, the PSQI was designed to evaluate overall sleep quality in these clinical populations. In scoring the PSQI, seven component scores are derived, each scored 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score (range 0 to 21). Higher scores indicate worse sleep quality. Developers have suggested a cutoff score of 5 for the global scale.

Quality of Life Scale-Short form (SF-36)

Koçyiğit et al. adapted the scale, which was originally developed by Ware et al. the person's health status is evaluated for the last month in the scale with eight subdimensions [21, 22]. Low scores indicate poor quality of life. Higher scores indicate better health status, and a mean score of 50 has been articulated as a normative value for all scales. This scale provides a comprehensive assessment of the physical, mental and social components of health status. The SF-36 questionnaire consists of eight scales yielding two summary measures: physical and mental health. The 36 questions on the SF-36 are meant to reflect 8 domains of health, including physical functioning, physical role, pain, general health, vitality, social function, emotional role, and mental health.

Laboratory samples

In patients, biochemical tests and prolactin levels were measured from 2 cc blood taken from the vein in the antecubital region during routine controls. Blood samples awere centrifuged at 3000 rpm for 10 minutes and the serums were separated. The separated sera were kept at -70°C until a sufficient number of patients were reached. Prolactin levels were measured with the Luminescent Immune Assay (LIA) method using the Architect kit. Biochemical analyzes were measured with Beckman LX-20 auto analyzer using Beckman Synchron kits. Cholesterol and HDL levels were examined after 8 hours of fasting. The range of values accepted as normal in our hospital laboratory is 2.64-13.13 µg/L for prolactin, 74-100 mg/dL for glucose, 0-200 mg/dL for cholesterol, 40-60 mg/dL for HDL, AST, ALT It is 5-40 U/L, 12-50 mg/dL for urea, 0.51-1 mg/dL for creatinine. Values calculated above 13.13 µg/L for patients were accepted as hyperprolactinemia.

Statistical analysis

Statistical analysis was performed using SPSS version 22.0 (IBM, Armonk, NY, USA). The normality distribution of the data was analyzed with the Kolmogorov-Smirnov Test. Numbers and percentages were used for categorical data and mean and standard deviation were used for numerical data. The comparison of the questionnaires according to the type of drug used was made with the Kruskal-Wallis test (it is used for comparing two or more independent samples of equal or different sample sizes), while the relations between the drug groups were examined using Dunn-Bonferroni test (it is used to identify which pairs of means are significantly different from each other). In descriptive statistics were expressed as number and percentage for categorical variables, as mean ± standard deviation, minimum and maximum value for continuous variables. It was considered significant when the p-value was less than 0.05.

Results

Demographic characteristics of the participants

A total of 61 patients were included in the study. Among these, 49 (80.3%) were male, and 12 (19.7%) were female. The mean age of all patients was 36.4±9.96 years. All patients were using only depot antipsychotics (39 (63.93%) people were using paliperidone depot, 12 (19.67%) were using risperidone depot, and 10 (16.39%) were using zuclopenthixol depot. The mean height measurements of the participants were 170.31±8.79 and the average weight measurements were 76.7±15.71. Body Mass Index was calculated as 24.49±5.18. None of the participants had a chronic disease or alcohol/substance abuse that required treatment. A total of 17 (27.86%) patients had not received inpatient treatment before and 44 (72.13%) patients had repeated hospitalizations in the psychiatry ward (Table 1).

Table 1. Demographic characteristics of the participants.

Characteristics		n	%
Marital status	Single	36	59
	Married	12	19.7
	Separated	13	21.3
Education level	Literate	6	9.8
	Primary school	16	26.2
	Middle school	16	26.2
	High school	19	31.1
	University	4	6.6
Employment status	Employee	24	39.3
	Housewife	12	19.7
	Officer	6	9.8
	Unemployed	15	24.6
	Retired	3	4.9
	Farmer	1	1.6
Income level (TL)	< 10.000	28	45.9
	10.000-15.000	16	26.2
	15.000-20.000	5	8.2
	20.000-25.000	7	11.5
	> 25.000	5	8.2
The way the patient arrives at the hospital	Willingly	30	49.2
	Unwillingly	26	42.6
	With family coercion	5	8.2
Psychiatric disorders duration (years)	< 1	19	31.1
	1-10	21	34.4
	> 10	21	34.4

The scale scores and laboratory parameters results of the patients

The mean fasting blood sugar of the participants was 92.27±22.17 and cholesterol values were 177.78±40.53. Renal function tests were urea 25.63±7.61 and creatinine 0.83±0.3. For liver function tests, the AST value was 22.7±18.5 and ALT was 20.29±13.23 (Table 2).

The comparison of the scale scores and laboratory parameters according to the types of depot antipsychotics used by the patients

No differences were detected between the groups regarding sleep quality scale scores ($p>0.05$). A minimal difference was detected between the groups only in the social functionality sub-dimension of the quality of life scale. Although paliperidone and risperidone depots were not different in this sub-dimension, the scores of the zuclopenthixol depot group were found to be the lowest ($p=0.049$). The comparison of scale scores and laboratory parameters in which the patients were grouped and compared according to the depot drug form they used are given in Table 3.

Discussion

using depot antipsychotic drug forms (depo zuclopenthixol, depot risperidone, depot paliperidone palmitate) as monotherapy. No differences were detected in terms of laboratory parameters and sleep quality. For the quality of life, social functionality subscale scores were worse in patients using zuclopenthixol depot compared to other forms. No differences were detected between other quality-of-life scores.

As far as the influence of socio-demographic characteristics of gender and age of schizophrenic patients on their quality of life is concerned, results of some researches do not show significant correlation with the quality of life [23]. Exception is the influence of belonging to female gender, which is in correlation with the quality of life of these patients, as shown by the results of the research in two studies [24, 25]. Considering that 80% of the patients in our study were male patients, we think that socio-demographic characteristics alone do not have an effect on quality of life in line with the studies.

A disruption in the sleep/wake rhythm paves the way for

Table 2. Questionnaire scores and biochemical results.

	Mean±SD	Min-Max	Confidence Interval
PSQI -SSQ	0.9±0.76	0-3	0.7-16.67
PSQI-SL	1.67±1.15	0-27	1.37-1.96
PSQI-SD	8.78±2.22	5-17	8.21-9.35
PSQI-HSE	0.98±1.11	0-3	0.69-1.26
PSQI-SD	1.77±1.5	0-11	1.38-2.15
PSQI-USM	1.36±1.32	0-3	1.02-1.7
PSQI-DD	0.88±1.19	0-6	0.57-1.19
PSQI-Total	16.36±3.93	10-27	15.35-17.36
SF-36-PF	73.45±26.62	1-100	66.64-80.27
SF-36-RP	50±37.08	0-100	40.5-59.49
SF-36-RE	40.29±43.96	0-100	29.3-51.55
SF-36-VT	49.86±20.94	0-100	44.5-55.23
SF-36-MH	53.54±18.48	0-100	48.8-5.27
SF-36-SF	43.36±25.87	0-100	36.73-49.98
SF-36-BP	42.29±28.25	0-100	35.06-49.53
SF-36-GH	46.88±2.29	0-100	41.68-52.08
Glucose	92.27±22.17	55-206	86.54-98
Urea	25.63±7.61	9.3-40.1	23.68-27-58
Creatinine	0.83±0.3	0.45-2.91	0.75-0.91
Cholesterol	177.78±40.53	106-205	167.4-188.16
HDL	44.03±10.49	26-69	41.34-46.72
AST	22.7±18.5	8-49.5	17.96-27.44
ALT	20.29±13.23	6-64.1	16.89-23.68
Prolactin	53.1±36.75	1.96-200	43.53-62.68

Mean±SD: Mean±standard deviation; Min-Max: Minimum-Maximum value; PSQI-SSQ: Pittsburgh sleep quality index - subjective sleep quality; PSQI-SL: Pittsburgh sleep quality index-sleep latency; PSQI-SD: Pittsburgh sleep quality index-sleep duration; PSQI-HSE: Pittsburgh sleep quality index-habitual sleep efficiency; PSQI-SD: Pittsburgh sleep quality index-sleep disturbances; PSQI-USM: Pittsburgh sleep quality index-use of sleeping medication; PSQI-DD: Pittsburgh sleep quality index-daytime dysfunction; PSQI-total: Pittsburgh sleep quality index-total score; SF-36: Quality of life questionnaire-short form 36; SF-36-PF: Quality of life questionnaire-physical functioning; SF-36-RP: Quality of life questionnaire-role physical; SF-36-RE: Quality of life questionnaire-role emotional; SF-36-VT: Quality of life questionnaire-vitality; SF-36-MH: Quality of life questionnaire-mental health; SF-36-SF: Quality of life questionnaire-social functioning; SF-36-BP: Quality of life questionnaire-bodily pain; SF-36-GH: Quality of life questionnaire-general health; HDL: high-density lipoprotein; AST: aspartate aminotransferase; ALT: alanine aminotransferase.

Table 3. The relationship between depot antipsychotic drugs and questionnaire scores and laboratory parameters.

	Zuclopenthixol depot	Risperidone depot	Paliperidone depot	P value
	(N=10)	(N=12)	(N=39)	
PSQI -SSQ	0.75±0.46*	0.83±0.93	0.94±0.79	0.739
PSQI-SL	1.87±0.99	1.41±1.5	1.76±1.06	0.383
PSQI-SD	9.75±3.41	8.66±1.66	8.71±2.07	0.643
PSQI-HSE	0.62±1.18	0.91±1.16	1.05±1.07	0.434
PSQI-SD	1.62±0.51	1.58±1.5	1.89±1.68	0.646
PSQI-USM	1.5±1.41	1.33±1.37	1.33±1.32	0.958
PSQI-DD	0.87±1.12	0.5±0.9	1.02±1.3	0.421
PSQI-Total	17±4.2	15.25±4.26	16.74±3.83	0.324
SF-36-PF	76.62±38.83	78.33±22.49	72.17±26.02	0.696
SF-36-RP	59.37±42.12	62.5±36.14	44.87±35.89	0.277
SF-36-RE	53.11±40.32	49.99±48.2	34.18±42.91	0.266
SF-36-VT	48.12±22.5	45±22.86	51.38±20.76	0.342
SF-36-MH	46.12±9.26	54±18.25	54.46±20.25	0.461
SF-36-SF	33.62±26.09[b]	58.41±24.63[a]	41.02±25.64[a]	**0.049**
SF-36-BP	38.75±33.75	43.54±33.19	43.97±25.96	0.901
SF-36-GH	45.61±15.22	48.33±24.24	46.66±20.81	0.992
Glucose	80.82±15.12	89.34±15.54	96.31±24.71	0.133
Urea	23.73±5.52	21.85±8.04	27.17±7.34	0.071
Creatinine	0.83±0.04	0.77±0.14	0.84±0.36	0.696
Cholesterol	166±25.57	184.08±40.55	178.82±44.24	0.552
HDL	43.12±12.25	43.5±9.78	44.82±10.64	0.830
AST	17.37±6.89	20.76±9.94	20.95±8.27	0.314
ALT	20.77±8.88	22.25±14.55	19.16±13.53	0.556
Prolactin	40.44±23.56	46.11±28.25	59.19±40.13	0.451

Kruskal-Wallis and Tukey HSD tests were used to analyze the data in the table. *: mean±standard deviation; PSQI-SSQ: Pittsburgh sleep quality index - subjective sleep quality; PSQI-SL: Pittsburgh sleep quality index-sleep latency; PSQI-SD: Pittsburgh sleep quality index-sleep duration; PSQI-HSE: Pittsburgh sleep quality index-habitual sleep efficiency; PSQI-SD: Pittsburgh sleep quality index-sleep disturbances; PSQI-USM: Pittsburgh sleep quality index-use of sleeping medication; PSQI-DD: Pittsburgh sleep quality index-daytime dysfunction; PSQI-total: Pittsburgh sleep quality index-total score; SF-36: Quality of life questionnaire-short form 36; SF-36-PF: Quality of life questionnaire-physical functioning; SF-36-RP: Quality of life questionnaire-role physical; SF-36-RE: Quality of life questionnaire-role emotional; SF-36-VT: Quality of life questionnaire-vitality; SF-36-MH: Quality of life questionnaire-mental health; SF-36-SF: Quality of life questionnaire-social functioning; SF-36-BP: Quality of life questionnaire-bodily pain; SF-36-GH: Quality of life questionnaire-general health; HDL: high-density lipoprotein; AST: aspartate aminotransferase; ALT: alanine aminotransferase.

the development of various diseases in mental health and vice versa. In other words, sleep/wake rhythm may be disrupted as a result of psychiatric diseases [26, 27]. Insomnia, sleeping much, daytime sleepiness and related difficulties in attention concentration, and exacerbation of psychotic symptoms are the symptoms frequently encountered in chronic psychiatric patients. In addition to these, the sleep/wake rhythm may also be disrupted as a side effect of the treatments [28]. In previous studies conducted with oral forms of some antipsychotic drugs, it was reported that these can cause sleepiness [28, 29]. In a study that was conducted with patients using paliperidone depot, it was reported that insomnia could be a side effect at a rate of 15.2% [30]. However, no study was detected in the literature comparing the effects of depot antipsychotic forms on sleep/wake cycle and sleep quality. Although the effect of antipsychotics on sleep patterns is not fully known, these drugs may cause sedation by increasing the activities of systems that provide sleep or by decreasing the activity of systems that provide wakefulness. In our study, when three depot antipsychotic drugs were compared in terms of sleep quality scores, we did not detect any difference. We think that these data will be useful in the selection of depot antipsychotic treatment in patients with schizophrenia. As it is a field that has not been examined before in the literature, the result obtained here is valuable, but further studies should be done to interpret it.

Quality of life decreases in chronic psychiatric patients due to many reasons. Among these, a decrease in cognitive and social skills, a decrease in stress tolerance, social isolation, and exposure to stigma are listed [13]. Studies conducted with depot antipsychotic forms show that it significantly reduces the duration and frequency of hospitalization and reduces the cost of treatment compared to oral antipsychotics [31]. It was also determined that long-acting-depot forms indirectly increase the quality of life of patients by increasing treatment compliance and decreasing hospitalization [32]. In a study that compared oral and long-acting forms, it was reported that life satisfaction and satisfaction increased with depot forms without giving the name of the preparation [33]. In another study, depot forms and oral forms were compared without giving the name of the preparation. Although no changes were detected in the quality of life in the results, it was determined that there was a decrease in the side effect profile and the need for electroconvulsive therapy (ECT) [34]. In the literature, no study was detected in which the effects of depot antipsychotic forms on quality of life were compared; the situation is also the same for sleep quality. In the results of the present study, the quality of life of the drug groups was not different. In our study, there was no difference in quality of life and sleep quality scores in patients using typical (zuclopenthixol) and atypical (risperidone, paliperidone) depot antipsychotics. In the absence of difference between drug groups in terms of these questionnaires; we think that factors such as the similar pharmacological effects of drugs, individual perceptions and differences during the application of the questionnaires, and the effect of confounding variables are effective. However, the scores of the patients who used zuclopenthixol depot only in the area of social functioning were lower than the other two groups. In studies that compared typical antipsychotics with second-generation antipsychotics, it was reported that second-generation antipsychotic drugs have a more positive effect on the quality of life than first-generation ones [35, 36].

Social functionality can be defined as the ability to work, maintain interpersonal relationships, and take care of oneself. Impairment in social functioning is one of the defining features of schizophrenia and persists throughout the illness. Social functionality in schizophrenia; negative and positive symptoms are affected by mood, social behaviors and environmental conditions. Research findings show that especially negative symptoms have negative effects on social functionality. When comparing typical and atypical antipsychotics, it has been reported that atypical antipsy-

chotics have more positive effects on negative, cognitive and depressive symptoms [37]. We think that the social functionality scores of patients using this drug were lower due to the relatively low effect of zuclopenthixol on negative symptoms compared to other atypical antipsychotics.

Antipsychotics cause important side efects, most importantly extrapyramidal motor disorders, and increase in prolactin, metabolic side effects, liver and kidney disorder. Metabolic side efects comprise weight gain, disturbances in cholesterol and triglyceride metabolism (dyslipidaemia) and dysregulation of glucose homeostasis (insulin resistance extending in diabetes) [38]. In the literature, long-acting injectable forms and oral drugs have been compared in terms of metabolic side effects. Long-acting injectable forms have been shown to cause fewer metabolic side effects [39]. In our results, no differences were detected between the three groups in terms of laboratory parameters that we evaluated. For three of depot antipsychotics; the mean levels of laboratory tests other than prolactin were within the normal range. Hyperprolactinemia is often caused by the use of antipsychotic medications, and this side effect with both oral and depot formulations, as side effect profiles of depot formulations is similar their oral formulation counterparts. The important features of depot antipsychotics are that they are effective on symptoms in schizophrenia patients, their blood levels are stable and they are well tolerated. Our data showed that these three depot antipsychotics had fewer side effects on biochemical tests, except for mild hyperptolactinemia. We believe that this feature is an advantage of depot antipsychotics over oral antipsychotics.

The findings of the present study should be evaluated by considering some limitations. The first is the relatively insufficient number of participants. Secondly, the gender distribution in the study was not equal. The thirdly, there was no power analysis for study. Finally, the distribution of drugs was not even. These limit the interpretation and generalization of our results. Further studies are needed for the findings of the present study to gain importance.

Conclusion

This article presents current/real life data that might be considered natural observation in a regional hospital. Important indicators of the success of antipsychotic treatment that are the improvement in quality of life and sleep, as well as the reduction in symptomatology in patients with schizophrenia. This study showed that the investigated depot antipsychotics had similar effects in terms of drug side effects, quality of life and sleep. Only, the social functionality subscale scores for quality of life were worse in schizophrenic patients who used zuclopenthixol depot compared to other drugs. We think, these data is an important in terms of determining which drug should be selected for which patient on an individual basis. However, large-scale methodological studies comparing the side effects of depot antipsychotics are needed.

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Ethical approval

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