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Research / Araştırma

The Correlation of Suicide Attempt and Suicidal Ideation with Insight, Depression and Severity of Illness in Schizophrenic Patients

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ABSTRACT

The correlation of suicide attempt and suicidal ideation with insight, depression and severity of illness in schizophrenic patients

Objective: At this study, it is aimed to determine criteria to predict the suicidal risks of schizophrenic patients and to explore the correlation of suicide attempt and suicidal ideation with insight, depression and severity of illness as well.

Method: Randomly selected 104 inpatients between 20 and 65 years of age, treated with a diagnosis of schizophrenia according to DSM-IV-TR criteria at Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery were included, and patients were examined at the period of first 72 hours of admission. The patients were evaluated with Schedule for Assessing the Three Components of Insight (SAI), Positive and Negative Syndrome Scale (PANSS), and Calgary Depression Scale for Schizophrenia (CDSS).

Results: Depression scores were higher in the patients who had suicide attempt compared to those without suicide attempt. Depression and insight scores of the patients who had suicidal ideation were found to be higher compared to those without suicidal ideation. In the logistic regression analysis, CDSS was found to be the determinant of suicide attempt and suicidal ideation, PANSS negative total score was found to be the determinant of suicidal ideation, and self destructive behavior was found to be the determinant of suicide attempt.

Conclusion: As depression was the common factor that determines the suicidal ideation and suicide attempts, suicidal ideation should be inquired more carefully and in more detail in the presence of depressive symptoms in patients with schizophrenia. We consider that CDSS can be easily applied and can determine the depression in patients with schizophrenia and the treatment of depression with eligible methods in turn, decreases risk of suicide.

Key words: Depression, insight, PANSS, schizophrenia, suicide

ÖZET

Şizofreni hastalarında özkıyım girişimi ve özkıyım düşüncesinin, hastalık şiddeti, depresyon ve içgörü ile ilişkisi

Amaç: Bu çalışmada şizofreni hastalarında özkıyım girişimi ve özkıyım düşüncesinin hastalık şiddeti, depresyon ve içgörü ile ilişkisi araştırılarak, şizofreni hastalarında özkıyım riskini yordayabilecek ölçütlerin gelişmesine katkı sağlanması amaçlanmıştır.

Yöntem: Bakırköy Prof. Dr. Mazhar Osman Ruh Sağlığı ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi psikiyatri servislerinde DSM-IV-TR ölçütlerine göre şizofreni tanısı ile yatarak tedavi gören, 20-65 yaş arasındaki 104 hasta rastgele seçilmiş, hastalar hastaneye yattıktan sonraki 72 saat içinde değerlendirilmiştir. Olgular, İçgörünün Üç Bileşenini Değerlendirme Ölçeği (İÜBDÖ), Pozitif ve Negatif Sendrom Ölçeği (PANSS) ve Calgary Şizofrenide Depresyon Ölçeği (CŞDÖ) kullanılarak değerlendirilmiştir.

Bulgular: Özkıyım girişimi öyküsü olan hastalarda depresyon puanları, özkıyım girişimi öyküsü olmayan hastalara göre daha yüksek bulunmuştur. Özkıyım düşüncesi olanların içgörü ve depresyon puanları, özkıyım düşüncesi olmayanlara göre daha yüksek bulunmuştur. Lojistik regresyon analizinde CŞDÖ özkıyım girişimi ve özkıyım düşüncesini, PANSS negatif toplam puanı özkıyım düşüncesini, kendine zarar veren davranış ise özkıyım girişimi öyküsünü belirleyen değişken olmuştur.

Sonuç: Özkıyım girişimi ve özkıyım düşüncesini belirleyen ortak etken depresyon olduğundan, şizofreni hastalarında depresif belirtiler varlığında özkıyım düşüncesinin daha dikkatli ve ayrıntılı sorgulanması gerekmektedir. Kolaylıkla uygulanabilecek CŞDÖ'nün, şizofreni hastalarındaki depresyonu kolaylıkla saptayabileceğini, uygun tedavi yöntemleri ile depresyonun tedavisinin özkıyım riskini azaltabileceğini düşünmekteyiz.

Anahtar kelimeler: Depresyon, içgörü, PANSS, şizofreni, özkıyım

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INTRODUCTION

World Health Organisation divides suicide into two groups, completed suicide and suicide attempt. Completed suicide is indivdual's killing him/herself intentionally and by his/her own will, while suicide attempt is all intentional, non-lethal attempts for suicide including hurting and poisoning him/herself (1). Prevalence of suicide changes between 10 to 40 in one hundred thousand in different countries. Suicide attempt is almost 15 times more common (2). Of all suicide attempts, 5% is serious, 30% is ambivalent (the person both wants and does not want to die) and 65% is in the form of a show (3). In our country, Turkish Statistical Institute indicates rough suicide rate as 3.62 in one hundred thousand in 2011 (4).

Suicide is one of the leading causes of premature death among schizophrenia patients. It has been reported that 18-55% of schizophrenia patients attempt suicide during the disorder, and 2-13% of the patients die from suicide (5). In some follow-up studies, 10-13% of schizophrenia patients were reported to commit suicide (6). Yildiz et al. (7) retrospectively investigated medical records of 720 schizophrenia patients in a multi-central study and found that 52% of the patients had suicidal thoughts or suicide attempts and 28% of the patients attempted suicide at least once.

Results of a national study from England indicated that, during 1996-1998 period 20% of suicide victims had schizophrenia, 50% of the patients applied to a psychiatric institution in the last 7 days and that 85% of these patients were evaluated to have low risk (8). Yet in another study, when 17 patients with schizophrenia who lost their lives because of suicide were investigated, it was found that 16 of those patients were currently on treatment and 76% of the doctors treating these patients did not think that the patient was at risk for suicide and self-injurious behaviors were detected in one third of these patients (9).

Risk factors for suicide in schizophrenia patients include previous suicide attempts, current and/or past depression, young age (frequently younger than 30), white race, being male, being unmarried, gradual onset, social isolation, further cognitive loss concerns, hopelessness, paranoid schizophrenia, substance abuse, intentional self-injurious behaviors, chronic disease with frequent excacerbations, suicide history in the family, agitation and impulsivity, fluctuations in suicidal thoughts, extrapyramidal symptoms due to medications, frequent relapses and rehospitalizations, negative attitudes towards treatment and low treatment compliance and difficulties in interactions with health professionals (10).

Kelly et al. (11), found that, when compared with schizophrenia patients who died from other reasons, patients with completed suicide had a higher rate of positive symptoms, including thought control, thought insertion, loose association and flight of ideas. Weismann et al. (12) suggested that patients who attempt suicide show hostility rather than depression. Harkavy et al. (13) showed that suicide attempt was associated with negative symptoms. Hellerstein et al. (14) reported that similar suicidal thoughts among patients with or without hallucinations.

Addington et al. (15), conducted a study in which they investigated the association between symptoms and past and current suicidal ideas in 50 patients with schizophrenia, one week and six months after admission. In this study, they showed that past suicide attempts were associated with current depression, female sex, low education and frequent hospitalizations. Depression was associated with current suicidal ideas in the first and second interviews, negative symptoms were in the first interview, and hallucinations and delusions were in the second interview.

Schizophrenia is a high-risk situation both for suicide and depression and presence of depression in schizophrenia may be the most important identifiable risk factor for suicide. There is a history of depression in a significant portion of patients with schizophrenia who attempt suicide (16). Prevalence of depression in schizophrenia reported to be between 7-75%. Another study reported frequency of depression comorbidity as 52% in acute psychotic period and 38% in more stable periods (17). Roy et al. (18) found that schizophrenia

patients who attempted suicide might significantly more complained from major depression during their illness.

Several scientists and clinicians argue that suicidal behaviors in psychotic disorders and insight are associated. It has been reported that patients with insight to their illness are at increased risk of suicide (19,20). During interviews with schizophrenia patients on the course of their illness, Strauss (21) found that relapse after gradual improvement led to extreme hopelessness. It has been argued that insight increases hopelessness and suicide risk while neurocognitive deficits decrease suicide risk. On the other hand, other studies did not find any association between insight and suicide risk (22,23).

Although risk of suicide is higher early in the course of the disorder, it continues lifelong in schizophrenia. Important components of treatment are effective treatment of symptoms and depression, decreasing substance abuse, avoiding akathisia, detecting low morale and instillation of hope. New generation atypical antipsychotics, particularly clozapine, and psychological interventions such as cognitive behavioral therapy are helpful to reduce suicidal ideas and attempts in schizophrenia. Important developments to detect neurobiological foundations of suicide will lead to implementation of more effective treatments (24).

Aim of this study was to investigate the association between suicide attempt and ideas with severity of disorder, depression and insight. We also evaluated the association of sociodemographical features (gender, age, marital status, and employment), some features of the illness (duration of illness, number of hospitalizations, history of substance abuse), depressive symptoms and suicide, in order to develop criteria which will predict risk factors for suicide in schizophrenia patients.

METHOD

One hundred and four patients who were diagnosed with schizophrenia per SCID-I structured according to DSM-IV criteria (25) and hospitalized at Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, between October 2009-January 2010 were randomly included in the study. A total of 142 patients were invited to the study but some of the patients refused to join because of lack of time, concerns about being hurt or just for not wanting it.

Ethical board approval was obtained before the study, all patients were informed on interviews and scales and that their decision to join the study will not lead to a positive or negative change in their treatment and oral and written consent were taken from patients who accepted to contribute to the study.

Schedule for Assesing the Three Components of Insight (SAI), Positive and Negative Syndrome Scale (PANSS), Calgary Depression Rating Scale (CDRS) and sociodeographic information form were applied to the patients. Suicidal ideas and tendencies were evaluated with eighth question of CDRS. Intentional behaviors without the intent to kill oneself by using sharp instruments or hitting and head bumping which cause various degrees of tissue damage is called self-injurious behaviors.

Patients with mental retardation or dementia and patients who received ECT treatment were excluded from the study since these conditions might impaire cognitive functions.

Measures

Sociodemographic and Clinic Information Form: This form is applied by the interviewer to each patient to collect information on sociodemographical features and current and past clinical status.

Schedule for Assesing the Three Components of Insight (SAI): David (26), developed SIA, which is administered by clinician and evaluates insight quantitatively, by thinking that insight can not be evaluated as all or none, and have three dimensions including the recognition that one has an illness, compliance with treatment and the ability to identify psychotic experiences correctly. SIA is a semistructured interview consisting of eight

questions. Maximum score of he first seven questions is 14. Eighth question is hypothetical and interviewer decides to ask this question or not. With this question maximum score is 18. Arslan et al. (27) conducted reliability and validity studies of the Turkish form in 2001.

Positive and Negative Syndrome Scale (PANNS): It is developed by Kay et al. (28). It is a semistructured interview scale with thirty questions with seven scores. Of thirty psychiatric parameters, 7 questions form positive syndrome subscale, 7 questions form negative syndrome subscale and the remaining 16 questions form general psychopathology subscale. Kostakoğlu et al. conducted reliability and validity studies of the Turkish form in 1999 (29).

Calgary Depression Rating Scale (CDRS): It is developed by Addington et al. (30). Aydemir et al. conducted reliability and validity studies of the Turkish form (31). This is an interviewer rated scale consisting of 9 Likert type items. These items include depressive affect, referential thoughts associated with guilt, hopelessness, worthlessness, patological guilt, morning depression, early waking, suicide and observed depression. The aim of developing CDRS was to have a scale which is not affected by negative and positive symptoms or extrapyramidal side effects, and some studies have supported this claim. Cut-off score for schizophrenia in Turkish form is reported as 11/12. In our study we used 11 as cut-off score.

Statistical Analysis

Data is analysed with SPSS 15.0 for Windows software. Besides descriptive statistical methods (mean, standard deviation), chi-square test is used to compare categorical variables and Independent-Samples T test is used to compare continuous variables. Logistic regression analysis with suicidal ideation and suicide attempt as dependent variables were also conducted. For all statistical analysis, $p<0.05$ is reported as statistically significant.

RESULTS

Data on sociodemographical and clinical features of the patients are summarized in Table 1 (Table 1).

Study was conducted with patients 20-65 years of age, 30.8% (n=32) were female, 69.2% (n=72) were male. 60.6% (n=63) of the patients were single and 8.7% (n=9) were living alone. When education was concerned, 56.7% (n=59) were primary school graduates. Mean duration of illness in patients who attempted suicide was 13.39±8.67 years while mean duration of illness in patients who did not attempt suicide was 12.97±8.91 years. 48.1% (n=50) of the patients were hospitalized 0-4 times, 51.9% (n=54) were hospitalized 5 or more times. 13.5% (n=14) had substance abuse while 86.5% (n=90) did not. 29.8% (n=31) attempted suicide and 70.2% (n=73) did not. Some oft he subjects attempted suicide with more than one suicide method. 20.2% (n=21) of the patients had past history of self injurious behaviors.

There was no statistically significant association between age, gender, marital status, education, substance abuse, number of hospitalizations and duration of illness with history of suicide attempt ($p>0.05$). There was a statistically significant association between history of suicide attempt and employment status ($p<0.05$). History of suicide attempt was more common in patients who are unemployed. There was statistically significant association between history of suicide attempt and self-injurious behaviors ($p<0.05$). Suicide attempt was more common in patients with a history of suicide attempt. There was a statistically significant association between history of suicide attempt and suicidal thoughts ($p<0.01$). Suicide attempt is more common in subjects with suicidal ideas. Suicide attempt is significantly more common in patients with a family history of suicide attempt ($p<0.01$).

Among patients who attempted suicide 54.8% (n=17) jumped from high places, 35.4% (n=11) ingested drugs, 2.9% (n=3) hanged themselves. Other methods were less common and some of the patients used multiple types of methods for suicide.

PANSS negative total score was significantly different in terms of suicide attempt ($p<0.05$). PANSS

Table1: Comparison of sociodemographical and clinical features in terms of history of suicide attempt

	History of Suicide Attempt						
	Present		Absent				
	n=73	%	n=31	%	χ^2	df	p
Gender					2.58	1	0.10
Female	19	26.0	13	41.9			
Male	54	74.0	18	58.1			
Marital Status					4.31	4	0.36
Single	42	57.5	21	67.7			
Married	18	24.7	4	12.9			
Widow	4	5.5	2	6.5			
Divorced	9	12.3	3	9.7			
Living separately	0	0	1	3.2			
Employment					11.35	4	0.02
Employed	7	9.6	0	0			
Unemployed	63	86.3	28	90.3			
Retired	0	0	1	3.2			
Disability retired	0	0	2	6.5			
Housewife	3	4.1	0	0			
Education					3.90	4	0.41
None	5	6.8	2	6.5			
Literate	3	4.1	2	6.5			
Primary	45	61.6	14	45.2			
High school	12	16.4	10	32.3			
College	8	11.1	3	9.7			
Number of hospitalizations					0.66	1	0.41
Less than 5	37	50.7	13	41.9			
5 or more	36	49.3	18	58.1			
Substance abuse	11	15.1	3	9.7	0.54	1	0.46
Self injurious behaviors	9	12.3	12	38.7	9.39	1	0.02
Suicidal thoughts	11	15.1	15	48.4	12.88	1	<0.01
Family history of suicide	1	1.4	5	16.1	8.71	1	<0.01
Age (mean±SD)	38.20	10.34	38.30	10.93	t=-0.11		0.90
Duration of illness (mean±SD)	12.97	8.91	13.39	8.67	t=-0.21		0.82

χ^2: Chi-square test, t: Student t test

negative scores of patients without suicide attempt was significantly higher than those with suicide attempt. CDRS total score was higher in subjects who attempted suicide when compared with those without attempted suicide ($p<0.01$). Other scale scores were not statisctically significant in terms of suicide attempt ($p>0.05$) (Table 2).

SAI total score pointed out a statistically significant difference in terms of suicidal ideations ($p<0.05$). Subjects with suicidal ideations have higher SIA total scores than those without suicidal ideations. While subjects with suicidal ideations have higher CDRS total scores than those without suicidal ideations ($p<0.01$), there were no other statistically significant differences ($p>0.05$) (Table 3).

Logistic regression analysis indicated that CDRS predicted suicidal ideations and suicide attempt, PANSS negative total score predicted suicidal ideations, and self injurious behaviors predicted history of suicide attempt (Table 4).

DISCUSSION

Literature indicates that lifetime risk for schizophrenia is equal for men and women (32). We did not find any association between gender and suicide risk, depressive symptoms, insight, positive and negative symptoms in our study. Besides studies reporting higher suicide risk among male schizophrenia patients (33,34) and females with schizophrenia

Table 2: Comparison of scale scores in terms of suicidal attempt

	Suicide Attempt Present (n=31)		No Suicide Attempt (n=73)			
Scale Scores	**Mean**	**SD**	**Mean**	**SD**	**t**	**p**
SAI	3.66	5.01	5.55	4.06	-1.85	0.06
PANSS positive total	35.78	5.20	33.90	5.58	1.64	0.10
PANSS negative total	25.89	4.44	23.61	4.52	2.37	0.01
PANSS general psychopathology total	51.84	5.55	52.58	6.85	-0.58	0.56
CDRS	2.10	3.34	4.23	4.54	-2.65	0.009

SAI: Schedule for Assesing the Three Components of Insight, PANSS: Positive and Negative Syndrome Scale, CDRS: Calgary Depression Rating Scale, t: Student t test

Table 3: Comparison of scale scores in terms of suicidal ideations

	No Suicidal Ideations (n=78)		Suicidal Ideations Present (n=26)			
Scale Scores	**Mean**	**SD**	**Mean**	**SD**	**t**	**p**
SAI	3.62	4.57	6.04	5.11	-2.26	0.02
PANSS positive total	35.55	5.20	34.23	5.79	1.08	0.27
PANSS negative total	25.18	4.78	25.31	3.95	-2.12	0.90
PANSS general psychopathology total	51.47	6.26	53.81	4.54	-1.75	0.08
CDRS	1.31	2.56	7.00	3.92	-8.49	<0.01

SAI: Schedule for Assesing the Three Components of Insight, PANSS: Positive and Negative Syndrome Scale, CDRS: Calgary Depression Rating Scale, t: Student t test

Table 4: Predictors of history of suicide attempt and suicidal ideations in logistic regression analysis

							95% Confidence Interval	
	B	**S.H.**	**Wald**	**df**	**p**	**Odds Ratio**	**Lower**	**Upper**
Suicide attempt								
Self injurious behaviors	-1.357	0.529	6.585	1	0.010	0.257	0.091	0.726
CDRS	0.119	0.059	4.099	1	0.043	1.127	1.004	1.265
Constant	-0.180	0.501	0.129	1	0.719	0.835		
Suicidal ideations								
CDRS	0.534	0.106	25.210	1	<0.001	1.707	1.385	2.102
PANSS negative total	0.178	0.080	4.940	1	0.026	1.194	1.021	1.397
Constant	-7.511	2.321	10.470	1	0.001	0.001		

CDRS: Calgary Depression Rating Scale

Suicide Attempt: SAI, PANSS positive, PANSS negative, PANSS general psychopathology and CDRS total scores and self injurious behaviors were taken as independent variables

Suicidal ideations: SAI, PANSS positive, PANSS negative, PANSS general psychopathology and CDRS total scores and self injurious behaviors were taken as independent variables

(15,35) other studies did not find any association between gender and suicide risk (36,37).

In our study, 30.8% of the subjects attempted suicide. Rate of suicide attempt seems like mean of the rate reported in the literature, 18-55% (5). We did not find any significant association between duration of illness and suicide attempt. In the literature, along with studies reporting association between duration of illness and suicide attempt (7,38), other studies, consistent with our results, did not report any association (39-41). This difference might emerge from including inpatients or outpatients, patients from different sociocultural backgrounds and different mean duration of illness between studies. The most common three methods of suicide attempts were jumping from high places (54.8%), self-poisoning with drugs (35.4%) and hanging attempt (2.9%), some of the patients used more than one suicide method. In

France, a 10 years follow-up study of schizophrenia patients indicated that self-poisoning, jumping from high places, and hanging were three most common suicide methods (42). In another study, the most common method was hanging, followed by drug/poison and firearms (43).

Suicide attempt was more common in subjects with family history of suicide attempt when compared with subjects without such a family history. Our results seemed to be consistent with studies showing that suicide attempt in the family increase risk of suicide attempt in patients with schizophrenia (33,44). On the other hand, another study did not find any effect of suicide attempt in the family on risk of suicide attempt among schizophrenia patients (37). In terms of substance abuse, there was no difference for suicide risk between subjects who abused and the ones who did not abuse substance. In the relevant literature, although there are some studies reporting higher risk of suicide in schizophrenia patients who has substance abuse (33,34), another study did not report any significant association (37).

Kelly et al. (11) stated that positive symptoms were more common in schizophrenia patients who committed suicide. Another study also reported higher positive symptoms in schizophrenia patients who attempted suicide (45). In contrast to these studies, Harkavy et al. (13) reported an association between suicide attempts and negative symptoms. In our study, logistic regression analysis indicated that PANSS negative total and CDRS scores predicted suicidal ideations. Aydemir et al. (46) found depression overlapped with negative symptoms "affective blunting", "attention problems" and "apathy". It has been argued that, affective blunting can easily been interpreted as depressive affect in a schizophrenia patient who have difficulty in stating his/her feelings. Besides, common neurobiological mechanisms of depression and negative symptoms could lead to this result.

Several studies has shown that depression is associated with risk of suicide in patients with schizophrenia (11,47,48). It has been shown that major depression triggers suicide attempts and that depressive affect and hopelessness are associated with suicidal ideations (49,50). Gupta et al. (51) reported that in schizophrenia patients suicide attempts were associated with lifetime number of depressive episodes and that depression is a big risk factor among schizophrenia patients who attempted suicide. Similarly, Evren et al. (41) found significantly higher CDRS average score in patients with suicidal ideations and ideas of death when compared with the group without suicidal thoughts. In our study, we found that a statistically significant association between depressive symptoms and suicidal ideations. Our results supported these studies. Drake and Cotton (52) followed up a total of 104 patients including 15 schizophrenia patients who were hospitalized and completed suicide and schizoprehnia patients who did not attempt suicide for 3 to 7 years and found that before suicide, most of the patients had depressive affect rather than a complete depressive syndrome and that those who attempted suicide were not more depressive but more hopeless. Minkoff et al. (53) also argued that hopelessness is a stronger predictor of suicide than depression.

There are conflicting results on level of insight and suicide. When studies, which investigated the association between insight and suicide, are examined, it is evident that while some of the studies reported that insight predicted suicide (22,54), some other studies suggested that suicide risk even increased with better insight (19,20,55). In our study, SAI total scores were significantly higher in subjects with suicidal ideations; therefore, our results supported those studies which reported an association between insight and suicidal ideations.

In conclusion, literature includes quite different and conflicting information on the complex, multifactorial issue of association between insight and depression and suicide.

Depression associated with schizophrenia may be simultaneous with psychosis or be post psychotic, and post psychotic depression is found to be particularly associated with risk of suicide (56). In spite of these data, treatment of depression in schizophrenia patients is neglected and this leads to suicidal behaviors. Although it has been shown that antidepressant

medications can be used without increasing psychotic symptoms, their use in schizophrenia patients are still under what is expected (57). Depression is frequently masked by and confused with drug side effects and negative symptoms, an alert clinician can detect diagnosis with targeted questions. Although all suicide attempts in schizophrenia patients are not triggered by depression, psychological and psychopharmacological treatment of depression in patients with schizophrenia is important to reduce risk of suicide (58).

In our study, suicide attempt was significantly more common in schizophrenia patients who were unemployed. Based on this data, we believe that increasing the number and quality of rehabilitation centers, which are occupational areas for patients may decrease risk of suicide. Education programs aimed for families regarding the illness and treatment will also be helpful since families are essentially interested in the treatment of the patients.

Another result of our study was higher risk of suicide in patients with self-injurious behaviors. When information on these behaviors are obtained from the patients or their families during interviews, a more detailed assessment of suicide is necessary and it will be appropriate to schedule more frequent visits and warn the families to be more alert.

Finding an association between insight and suicidal ideations might be due to emergence of hopelessness and helplessness, by realizing social outcomes of schizophrenia and the lifelong need to depend on drugs. Suicide risk may be increased with hopelessness and helplessness. This does not mean that insight must be decreased in patients with schizophrenia. Dramatic increases in insight must be avoided and issue shall be handled in an appropriate therapeutic relationship. Structured psychotherapies may contribute to successful drug treatments. On the other hand, gradual gains of insight, depending on successful drug treatment of psychotherapies may decrease suicide risk and may contribute to treatment compliance that will protect the patient from recurrence. At the same time, treatment compliance may lead to a more positive outlook of the patients, and therefore decrease suicide risk. The best way to achieve these results seems to combine drug treatment and psychotherapy (59).

In spite of all efforts to detect suicide risk among schizophrenia patients, it has been suggested that suicide attempts in schizophrenia patients are frequently impulsive and can not be predicted and that scales used to assess risk of suicide have limited value (38). When the risk factors for suicide are taken into account, we think that larger, prospective studies using scales which assess hopelessness, treatment compliance and extrapyramidal symptoms may contribute significantly to the literature, and our lack of using these scales was the most important limitation of our study.

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