

Depression and Anxiety Symptom Severity in a Group of Children with Epilepsy and Related Factors

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SUMMARY

Objective: The aim of this study was to assess the anxiety and depression symptom severity in a group of epileptic children and compare the results to healthy controls. Additionally, the frequency of psychiatric disorders in epileptic children was also assessed.

Method: The study compared 30 children, ranging in age from 8 to 16 years with epileptic disorder who attended a children's neurology clinic, with healthy controls using the State-Trait Anxiety Inventory and Children's Depression Inventory scores, and suicidal ideation. The Mini International Neuropsychiatric Interview (MINI) was administered to epileptic patients to determine the frequency of psychiatric disorders in this clinical group.

Results: State anxiety scores of the epilepsy group were significantly higher compared to controls. No significant differences were found between patients and controls in terms of trait anxiety and depression scores. In all 3 scales, boys scored significantly higher than girls. No significant relationships were found between symptom severity, duration of epilepsy, age of seizure onset, and depression and anxiety scores. Psychiatric assessments with the MINI identified psychiatric disorders in 26.7% of epileptic patients. Two epileptic patients reported past suicidal attempt. However, only 2 patients were receiving psychiatric treatment.

Conclusion: Psychiatric disorders were frequently observed in the group of epileptic patients. Psychiatric disorders occurred more frequently in boys compared to girls in this group. Clinicians should be more aware of accompanying psychiatric symptoms in epileptic patients and take the necessary precautions in the early period of the illness in an effort to prevent future mental health problems.

Key Words: Epilepsy, anxiety, depression, suicide

INTRODUCTION

Epilepsy is one of the most frequently encountered chronic illnesses in childhood. Moreover, children with epilepsy are at risk for psychiatric disorders (Dunn and Austin, 1999). In the first epidemiological study of children and adolescents, Rutter et al. (1970) reported a frequency of psychiatric disorders in 6.6% of the general population, in 10.3% of patients with chronic illnesses, except those with neurological causes, and in 28.6% of epilepsy patients without additional central nervous system involvement. It was observed that similar findings were found in the studies that followed (Davies et al., 2003; McDermott et al., 1995).

Anxiety and depression are the most frequently encountered psychiatric disorders in epileptic children and adults. (Blumer et al., 1995; Beyenburg et al., 2005; Dunn et al., 1999; Vazquez et al., 2003). There are numerous studies reporting that the severity of anxiety and depression in epileptic patients is higher than normal controls (Beyenburg et al., 2005; Oğuz et al., 2002; Ott et al., 2001). In addition, suicidal ideation and attempt are more frequent in epileptic patients (Brent, 1986; Pompili et al., 2005). Caplan et al (2005) showed that suicidal ideation is significantly higher in epileptic children (20%) in comparison to the control group (9%). Suicide is a very important problem in adult epilepsy patients and its prevalence is approximately 3.5 times higher than in the general population (Nilson et al., 1997).

In epilepsy patients, factors related to seizures, such as the type of the seizure, frequency of the seizures, age of onset, the duration of the illness, whether the illness is controlled or not, the number of medications used, additional central nervous system involvement, psychosocial factors, and sociodemographic factors, including age and gender, may be related to the development of psychopathology (Davies et al., 2003; Mensah et al., 2006).

In a study conducted with 35 Turkish children, Oğuz et al. (2002) found that according to the self-report instruments employed, state-trait anxiety and depression scores in the 12-16-year-old age group and state anxiety score in the 9-11-year-old age group were significantly higher in epileptic children. Suicidal ideation was assessed in children and adolescents and it was found that the frequency of suicidal ideation was higher in epilepsy patients in comparison to the control group. A relationship between anxiety and depression scores and frequency of the seizures, duration of the seizures, and multiple anti-epileptic medication usage was found in the study. While Baki et al. (2004) found higher depression scores in 35 epileptic children in comparison to healthy controls, they could not find a significant difference in terms of state-trait anxiety scores. Moreover, there was also no relationship found between factors related to epilepsy, age, gender, and depression and anxiety scores. They also studied the mothers of epileptic children and healthy controls and reported that there was no difference in terms of depression and anxiety symptoms between the 2 groups. There was also no relationship between the severity of psychiatric symptoms of mothers and children.

Although psychiatric disorders are frequent in epileptic patients, they are not frequently diagnosed and treated (Caplan et al., 2005; Ott D. et al., 2003). It was found that only one third of the patients with psychiatric disorders receive treatment (Ott D. et al., 2003). The treatment rate can be expected to be lower in Turkey's conditions where families are reluctant to seek psychiatric help. This situation makes controlling psychiatric disorders in epileptic patients more difficult.

In this study, the levels of anxiety and depression symptoms in epileptic children were determined and the relationship between psychiatric symptoms and epilepsy was examined by comparing the patients with the controls. In addition, the relationship between the levels of anxiety and

depression symptoms and epilepsy was examined. Furthermore, in order to determine the distribution of psychiatric disorders and treatment rate, patients were assessed using a structured interview scale prepared according to DSM-IV criteria (American Psychiatric Association, 1994).

METHODS and MATERIALS

The study, which lasted for 6 months, included 30 consecutive patients (male: 14; female: 16) between the ages of 8 and 16 years with primary idiopathic epilepsy and no additional nervous system involvement or chronic disease, who had been receiving treatment for at least 6 months in the A.U.M.F. Children's Neurology Outpatient Clinic. The age- and gender-matched control group was randomly chosen from 3 schools that were in low, medium, and high socioeconomic level regions according to the Government Statistical Institute's data.

Characteristics related to illness of the participants, such as the type of seizures, frequency of seizures, age of onset, the duration of the illness, and anti-epileptic medications used were recorded. Patients with previously detected mental retardation, or cases that were suspicious for mental retardation due to both low school performance and general functionality, and patients with significant brain lesions detected in brain screenings were excluded from the study. The sociodemographics of the patients were recorded.

For the evaluation of the severity of epilepsy, we used a scale developed by Austin et al. (1996) that is based on seizure type, frequency of seizures, and number of antiepileptic medications used and side effects by scoring from 1 to 3 and adding up the scores.

Measurement Devices: The Child State-Trait Anxiety Inventories and Child Depression Inventory, both of whose reliability and validity were established for use with the Turkish population, were administered to the patients. The MINI Plus 5.0.0 was administered to the patients by the Department of Child Psychiatry in order to identify the distribution of psychiatric disorders.

Child State-Trait Anxiety Inventories: This inventory, developed by Spielberger (1976) has 2 subscales, each composed of 20 multiple choice questions for state trait anxiety. Each item is scored as 0, 1, or 2 according to the severity of the symp-

Table 1. Demographic and Clinical Characteristics

	Patients	Controls
Number	30	30
Age	12.27	11.97
Girls/ Boys	16/14	16 /14
Duration of the illness (years)	3.63	-
Type of the seizure		
Generalized Tonic-Clonic	20	-
Complex Partial	3	-
Simple Partial	4	-
Absence	3	-
Number of anti-epileptics		
Single drug	25	-
Multiple drug	5	-
Distribution of anti-epileptics		
Valproate	24	-
Carbamazepine	4	-
Oxcarbazepine	3	-
Lamotrigine	4	-
Pathology in neurological examination	0	-
Lesion in brain MR screening	0	-

tom. State anxiety defines the experienced anxiety under certain conditions and at a certain time and changes according to external factors. On the other hand, trait anxiety defines the feelings of the individual in general and reflects the individual's general predisposition to anxiety. The reliability and validity study of the scale for the Turkish population was conducted by Özusta (1993).

Child Depression Inventory: The scale developed by Kovacs (1980) is composed of 27 items. Each item is scored as 0,1, or 2 according to the severity of the symptom. The reliability and validity study of the scale for the Turkish population was conducted by Öy (1991).

MINI Plus 5.0.0: This scale is a structured interview scale for Axis-I disorders in DSM-IV and ICD-10, which was developed by Sheehan and Lecrubier (1998) and is administered by a clinician. The child and the parent are asked structured screening questions for every psychiatric disorder and a detailed assessment is conducted when the answer is yes. The translation of MINI to Turkish was conducted by Engeler (2004).

Statistical Analyses: SPSS version 10.0 was used for the analyses; t-test and correlation analyses were used in the comparison of continuous variables and chi-square test for the comparison of categorical variables. Scores obtained from the patient inventories were compared to the scores of age- and gender-matched healthy children with no previous history of psychiatric or physical illnesses.

FINDINGS

The mean age of the epilepsy patients was 12.27 ± 2.69 years, and the mean age of the control group was 11.97 ± 2.18 years, and there were no significant differences between the 2 groups ($t = 0.47$; $P = 0.64$). Both groups included 14 boys and 16 girls. The demographic and clinical characteristics of the patient and control groups are presented in Table 1.

When the scores of the patient and controls groups obtained from Child State-Trait Anxiety Inventory and Child Depression Inventory were compared, it was found that the state anxiety of the epilepsy patients were significantly higher than the control group ($t = 2.42$; $P = 0.018$). No significant differences were found between patients and controls in terms of Child Trait Anxiety ($t = 1.32$; $P = 0.193$) and Child Depression scores ($t = 1.87$, $p = 0.067$ (Table 2).

There were gender differences in anxiety and depression symptoms in epilepsy patients; boys had significantly higher scores of depression ($t = 2.15$; $P = 0.041$), trait anxiety ($t = 2.49$; $P = 0.019$), and state anxiety ($t = 2.14$; $P = 0.041$) in comparison to girls (Table 3).

There was no relationship between the scale that assessed the severity of epilepsy based on the type of the seizure, frequency of the seizure, and anti-epileptic medicine used developed by Austin et al (1996) and the scores obtained from Child Trait Anxiety ($r = -0.145$; $P = 0.470$) and State Anxiety Inventories ($r = -0.112$; $P = 0.571$) and Child Depression Inventory ($r = -0.159$; $P = 0.436$) (Table 4).

The relationship between the duration of illness and age of onset and the scores obtained from the anxiety inventories and depression inventory were examined. There were no significant relationships between the duration of illness and age of onset

Table II. Comparison of the Scores of the Child State-Trait Anxiety Inventory and Child Depression Inventory of the Patient and Control Groups (t-test)

	State anxiety Mean (SD)	Trait anxiety Mean (SD)	Depression Mean (SD)
Patient group	37.40 (6.58)	32.68 (6.56)	10.43 (5.17)
Control group	33.34 (6.22)	30.59 (5.20)	8.13 (4.32)
	P = 0.018*	P = 0.193	P = 0.067

*P < 0.05

and the scores obtained from Child Trait Anxiety ($r = 0.232$; $P = 0.218$ and $r = 0.203$; $P = 0.309$, respectively) and Child State Anxiety Inventories ($r = -0.47$; $P = 0.810$ and $r = -0.128$; $P = 0.515$, respectively), and Child Depression Inventory ($r = 0.217$; $P = 0.268$ and $r = -0.082$; $P = 0.691$, respectively) (Table 4).

Suicidal ideation in the patient and control groups was compared using the item that assesses suicidal ideation in the Child Depression Inventory. It was found that one child each from the patient and control groups (3.3%) had suicidal ideation with significant suicide intention and 11 children (36.7%) in the patient group and 6 children (20%) in the control group reported thinking about suicide. The difference between the patient and control groups in terms of suicidal ideation was not statistically significant (chi-square = 1.92; $P = 0.165$) (Table 5).

According to MINI, which is a structured assessment tool that evaluates patients according to DSM-IV criteria, it was found that 8 patients out of 30 had a psychiatric diagnosis and 2 patients who did not display any psychiatric disorder during the interview had a past history of suicide attempt. When the prevalence of receiving psychiatric treatment in patients with an active psychiatric disorder was examined, it was found that only 2 of the 8 patients had received treatment. The distribution of psychiatric disorders of the patients is provided in Table 6.

DISCUSSION

When epilepsy begins in childhood it may have negative effects on the mental health of the patient (Davies et al., 2003; McDermott et al., 1995). By using self-report scales and structured interviews, this study aimed to examine the effects of epilepsy

on child mental health in a group of epilepsy patients.

When the patient and control groups were evaluated according to the scores obtained from self-report instruments, it was found that state anxiety scores were significantly higher in the epilepsy group in comparison to the control group, whereas there were no differences between the 2 groups in terms of trait anxiety. The level of depressive symptoms was higher in the epilepsy group than in the control group and the difference approached statistical significance. The anxiety and depression levels of epilepsy patients are reported to be higher in the literature. Our findings are generally compatible with these reports (Dunn et al., 1999; Oğuz et al., 2002); however, there are some differences between the reported findings in the literature. In the study conducted by Oğuz et al. (2002), it was reported that trait anxiety level is higher in children and adolescents, state anxiety and depression levels are higher in adolescents in comparison to the control groups. On the other hand, Baki et al. (2004) found that depression scores were significantly higher in epileptic children, but the authors failed to find a difference in state and trait anxiety scores.

It was assumed that trait anxiety predicts a general predisposition to anxiety, free from external factors, and that trait anxiety predicts a changeable level of anxiety based on external factors (Spielberger 1976). It was believed that the findings of high levels of state anxiety in epilepsy patients and no difference between the patient and control groups in terms of trait anxiety is compatible with this assumption when physical illnesses are accepted as an environmental stress factor in our study. However, in the literature there is also a controversy in this subject, some studies reporting

Table III. Comparison of the Scores of the Child State-trait Anxiety Inventory and Child Depression Inventory of Boys and Girls with Epilepsy (t-test)

Gender	State anxiety Mean (SD)	Trait anxiety Mean (SD)	Depression Mean (SD)
Girls	35.12 (6.42)	30.00 (7.24)	8.43 (5.27)
Boys	40.00 (5.96)	35.57 (4.36)	12.41 (4.16)
	P = 0.041*	P = 0.019*	P = 0.041*

*P < 0.05

higher levels of anxiety in epileptic patients (Oğuz et al., 2002) and some that have not found any difference in terms of anxiety scores between patients and controls (Baki et al, 2004). Thus, this subject has to be studied further in future research.

It is well known that the frequency of depression and anxiety increases in chronic diseases (Katon et al., 2002; Voellinger et al., 2003). In epilepsy patients, attitude towards illness, which is effected by the unexpected timing of the seizures, chronic nature of the illness, and societal stigma attached to epilepsy, is probably contributory to high anxiety and depression levels. It is hypothesized that anti-epilepsy medication may have an effect on higher rates of psychiatric symptoms in epileptic patients. However, in the cited studies, when the fact that all medications used in the patients are also used as mood stabilizers is considered, there is quite a low probability that these medication have a negative effect on mental health. In fact, they might have a preventive effect.

It is seen that the rates of anxiety and depression in non-epileptic children are similar for boys and girls and more frequent in girls after the adolescence (Birmaher et al., 1996; Axelson and Birma-

her, 2001). In our study, boys scored significantly higher than girls on all 3 scales used in our study. Reports about the relationship between gender and emotional and behavioral problems in epileptic children are controversial in the related literature. In a study conducted with patients whose treatment was recently initiated, mental problems were found to be higher in girls (Austin et al., 2001). In the study conducted by Stores (1978), boys displayed higher rates of mental problems. Hoare and Kerley (1991) failed to find a difference in anxiety and depression between genders. When the gender distribution in adult epilepsy patients is examined, although depression and anxiety scores are higher in non-epileptic women (Piccinelli, 2000), there were no gender differences in terms of anxiety and depression in studies conducted with epileptic patients (Mensah et al., 2006). In addition, some studies reported higher levels of depression in male patients (Lambert and Robertson, 1999). These results evoke the assumption that epilepsy changes the distribution of anxiety disorders and depression among both genders and effects men more in terms of mental disorders. Although the underlying reason for this is unknown, it may be related to higher expectations from men in society,

Table IV. Relationships between the scores of the Child State-Trait Anxiety Inventory and Child Depression Inventory and severity of the illness, age of onset, and duration of the illness (Pearson's correlation analysis)

	Depression		Trait anxiety		State anxiety	
	(r =)	(P =)	(r =)	(P =)	(r =)	(P =)
Severity of the illness	-0.159	0.436	-0.145	0.470	-0.112	0.571
Age of onset	-0.082	0.691	0.203	0.309	-0.128	0.515
Duration of the illness	0.217	0.268	0.232	0.218	-0.047	0.810

r = Pearson's correlation coefficient

Table V. Suicidal Ideation Rates of the Patient and Control Groups (Chi-Square)

	Suicidal ideation Without intention	Suicidal ideation with suicidal intentions	Suicidal ideation Total
Patient group	11 (36.7%)	1 (3.3%)	12(40%)
Control group	6 (20%)	1 (3.3%)	7(23.3%)
P = 0.165, chi-square = 1.92			

which in turn, results in men being more affected from epilepsy, which then may cause stigmatization.

There were no relationships between the duration of epilepsy and age of onset, and psychiatric symptoms in our study. The number of studies reporting a relationship between psychopathology and duration of illness is high in the related literature (Datta et al., 2005; Dunn et al., 1997; Hoare and Kerley, 1991; Oğuz et al., 2002). The results of studies on age of onset and psychopathology are controversial. As there are studies reporting a relationship (Hermann et al., 1988) there are also studies that failed to find a relationship (Dunn et al., 1999; Ott et al., 2001; Oğuz et al., 2002). In addition, it was also reported that the age of onset is related to cognitive problems more so than emotional and behavioral problems (Schoenfeld et al., 1999).

There was no relationship between the scale that assess the severity of epilepsy based on the type of the seizure, frequency of the seizure, and anti-epileptic medicine used developed by Austin et al. (1996), and depression and anxiety scores. It was observed that in their studies conducted with the same scale for the severity of epilepsy, Dunn et al. (1999) found similar results. It is also observed that the findings of the studies examining the type of the seizure and psychopathology are also controversial (Ettinger et al., 1998; Dunn and Austin, 1999). There are studies reporting higher psychiatric symptoms in frequent seizures (Adewuya and Ola, 2005; Lambert and Robertson, 1999; Oğuz et al., 2002) and resistant epilepsies that require multiple medication usage (Adewuya and Ola, 2005; Ott et al., 2001; Datta et al., 2005).

Psychiatric assessments performed with the MINI identified psychiatric disorders in 26.7% of epileptic patients, in terms of DSM-IV criteria. In

Table VI. Distribution of Mental Disorders in Patients According to the MINI

Disorder	Frequency	Percentage
ADHD	2	6.7
Suicide attempt (life time)	2	6.7
M. Depression	1	3.3
M. Depression + social phobia	1	3.3
Social Phobia	1	3.3
Specific phobia	1	3.3
Panic dis.	1	3.3
Dysthymic dis.	1	3.3
Normal	20	66.7
Total	30	100

addition, 2 patients who did not display any psychiatric disorder during the interview reported a past history of suicide attempt. These rates are compatible with the psychiatric disorder rates for epilepsy patients in the literature and are important in terms of reflecting the importance of psychiatric disorders in epileptic children (Rutter et al., 1970; Davies et al., 2003; McDermott et al., 1995). Only two patients out of eight had been diagnosed as psychiatric cases before and treated accordingly. Most of the psychiatric cases in this population were not getting psychiatric help. The psychiatric disorders in our sample were mostly about internalizing type which may be one reason why families were not aware of the problems of these children. Also it can result from the general idea that depression and anxiety are normal for individuals with chronic illnesses.

The small size of our study population is a significant limitation of the study and may have hindered the detection of less significant relations

between the variables. Therefore, the lack of significant findings in the study should not be generalized. In addition, not applying a structured interview to the control group makes the comparison of the distribution of psychiatric disorders between both groups impossible.

CONCLUSION

In the presented study, it was found that the state anxiety level was higher in epileptic children in comparison to healthy controls and that the rate of psychiatric disorders and suicide was also high in this group of children, however, a sizeable proportion of our sample was not receiving any psychiatric treatment. When the chronic nature of epilepsy and the fact that psychiatric disorders observed in these patients can have consequences leading to death are considered, clinicians should be aware of the potential for and signs of accompanying mental disorders in epilepsy patients, and take necessary precautions in the early period.

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