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DEMOGRAPHICS AND CLINICAL FEATURES OF CHILDREN WITH FUNCTIONAL NEUROLOGICAL SYMPTOM DISORDER / CONVERSION DISORDER: A RETROSPECTIVE CROSS - SECTIONAL STUDY

İŞLEVSEL NÖROLOJİK SEMPTOM BOZUKLUĞU / KONVERSİYON BOZUKLUĞU TANILI ÇOCUKLARIN DEMOGRAFİK VE KLİNİK ÖZELLİKLERİ: GERİYE-DÖNÜK KESİTSEL BİR ÇALIŞMA

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ABSTRACT

AIM: Functional Neurological Symptom Disorder (FNSD) known as conversion disorder is physical manifestation of psychological stress. This study aimed to investigate demographics and clinical features of conversion disorder in children through data obtained by examining records of patients diagnosed with conversion disorder.

MATERIAL AND METHOD: Forty-four patients, aged 4-17years, who were followed up from Atatürk University Medical Faculty Hospital pediatric neurology and child and adolescent psychiatry out patient clinics were included in study. Clinical data of the sample including sociodemographic characteristics, clinical conditions, and treatment responses obtained from file records of cases in pediatric neurology and child and adolescent psychiatry clinics were retrospectively examined.

RESULTS: Of cases, 29 were female (65.9%), and 61.8% (n = 21) lived in rural areas. Factors that triggered conversion in 41.2% were school/ learning stressors, in 23.5%, they were loss/divorce /death. Rate of a visit to doctor in first attack was 88.4%. 61.4% (n=27) of patients who visited doctor presented to emergency department in their first attack and hospitalized at pediatric clinic. 40.9% of cases had conversion type with accompanying attacks or convulsions. Comorbid psychiatric disorders were found in 50% of cases. The time until diagnosis was significantly shorter in patients who had been taken to doctor in first attack, compared to those who had not($p = 0.032$). While 85.7% of conversion cases lasting for more than 6 months persisted, 90% of conversions that lasted less than 6 months recovered ($p = 0.026$).

CONCLUSION: Conversion disorder is mostly manifested by neurological symptoms and signs.
Early diagnosis and treatment of these patients is so essential.

Keywords: Conversion, DSM-5, children, adolescent

ÖZET

AMAÇ: Konversiyon bozukluğu, psikolojik stresin fiziksel yollarla kendini ortaya koymasıdır. Bu çalışmanın amacı, konversiyon bozukluğu tanılı hastaların kayıtlarının incelenmesiyle elde edilen demografik ve klinik veriler aracılığıyla çocuklarda konversiyon bozukluğunun özelliklerini araştırmaktır.

GEREÇ VE YÖNTEM: Yaşları 4-17 arasında değişen, Atatürk Üniversitesi Tıp Fakültesi Hastanesi Çocuk Nöroloji ve Çocuk Psikiyatri polikliniğinden konversiyon bozukluğu tanısı ile takipli olan 44 olgu çalışmaya alınmıştır. Olguların çocuk nöroloji ve çocuk psikiyatri kliniklerindeki dosya kayıtları geriye dönük incelenerek elde edilen sosyodemografik özellikleri, klinik durumları ve tedavi yanıtları irdelenmiştir.

BULGULAR: Olguların %65,9'u (n=29) kızdır. %61,8'i (n=21) kırsal alanda yaşamaktadır. Olguların %41,2'sinin konversiyonu tetikleyen faktörleri okul/öğrenme stresörleridir, %23,5'inin ise kayıp/boşanma/ölümdür. İlk atakta doktora başvuru oranı %88,4'tür. Doktora başvuran olguların %61,4'ü (n=27) ilk atağında acile başvururken, olguların aynı oranda da pediyatri kliniğine yatışları yapılmıştır. Konversiyon alt tipleri açısından olguların %40,9'u ataklarla veya konvüzyonlarlagiden tiptir. Olguların %50'sinde komorbid psikiyatrik rahatsızlık saptanmıştır. Tanı alana kadar geçen süre ilk atakta doktora götürülen olgularda, doktora götürülmeyen olgulara kıyasla anlamlı olarak daha kısadır($p = 0.032$).Altı aydan uzun süren konversiyon vakalarının %85,7'si düzelememiş olup, altı aydan kısa süren konversiyon vakalarının % 90'ı tamamen iyileşmiştir ($p = 0.026$).

SONUÇ: Konversiyon bozukluğu daha çok nörolojik semptom ve bulgularla kendini göstermektedir. Bu hastaların erken tanı ve tedavisi oldukça önemlidir.

Anahtar Kelimeler: Konversiyon, DSM-5, çocuk, ergen

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INTRODUCTION

Functional Neurological Symptom Disorder as a broader term that comprises of conversion disorder is the physical manifestation of various symptoms triggered by some psychological stress. To diagnose conversion disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), functional impairment cannot be explained by neurological and other medical conditions or substance effects, is associated with psychological factors, is not revealed purposefully, and should cause significant distress or cause a decrease in functionality in of social, professional, and other areas (1).

These symptoms vary from sensory symptoms such as numbnessor motor symptoms including convulsions or neurovegetative symptoms like aerophagia to the psychiatrics ymptoms such as hallucinations and delusions (2). Symptoms' severity also varies widely from person by person and may come and goor be persistent. Person affected has no control on his/her symptoms and they are not to be intentionally produced (3).

The causative factors of the functional neurologic disorder are unknown. The condition may be triggered by a reaction to stressor psychological trauma (1). Gender is another variable related to the conversion disorder that three times more common in females than in males (1). Living in rural areas, low socioeconomic status, low education level, lack of insight and low intelligence level are reported as risk factors that increase the frequency of conversion disorder (2).

Although the prevalence of conversion disorder is known to be around 50/100,000 per year,the precise prevalence of the disorder is unknown and is rarely seen in children living in western countries (4). It is more common in adolescents and young adults than children. In our country, the prevalance of the conversion disorder in children and adolescents was reported as about 3% in two studies, one conducted by Ankara University Medical School Child and Adolescent Psychiatry outpatient clinic (5) and another by Çukurova University Medical School Child and Adolescent Psychiatry outpatient clinic (6).

It is quite common for conversion disorder to be accompanied by another psychiatric disorder. Despite its low incidence in childhood, conversion disorder has extremely negative effects on the child's life. Thus, early diagnosis and treatment, especially education about the condition, can help with recovery. It is an essential disorder within the scope of pediatric neurology, child and adolescent psychiatry, and consultation-liaison psychiatry (4, 7).

This study aimed to investigate the demographics and clinical features of conversion disorder in children through data obtained by examining the retrospective records of patients diagnosed with conversion disorder who had been under follow-up.

MATERIAL AND METHOD

Forty-four patients, aged with 4-17 years, who were followed up from Atatürk University Medical Faculty Hospital pediatric neurology and child and adolescent psychiatry outpatient clinics between January 1st, 2012 and January 1st, 2017were included in the study. Patient consents were obtained.

The patients' inclusion criteria were determined as having a diagnosis of conversion disorder according to DSM-5 diagnostic criteria (1). One or more symptoms of altered voluntary motor or sensory function, clinical findings provide evidence of incompatibility between the symptom and recognized neurological or medical condition. The symptom or deficit is not better explained by another medical or mental disorder, and causes clinically significant distress or impairment, having normal electroencephalogram (EEG) examination, the absence of any chronic medical diseases and psychiatric disorders such as schizophrenia, intellectual disability, autism spectrum disorder, etc.

Age, gender, family structure,place of residence, marital status and education status of parents, family response to the disease, emergency admission, hospitalization status, time until diagnosis, symptoms' duration, conversion subtype, psychiatric and physical comorbidity, follow-up status and triggering stressor factors were evaluated obtained from the file records of the cases in pediatric neurology and child and adolescent psychiatry clinics were examined.

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Statististical Analysis

The data obtained from the research were analyzed via SPSS Version 20 (IBM SPSS, Chicago, IL) statistical analysis program. Descriptive categorical data were expressed as percentages. While parametric tests were applied for normally distributed variables, nonparametric tests were applied for variables that were not normally distributed. Pearson's $\chi 2$ and Fisher's exact tests analyzed categorical variables.The tests were examined at 95% confidence level $p < 0.05$ value was accepted as significant.

RESULTS

The age range of 44 cases participating in the study was 4-17 years, and the mean age was 13.4 ± 3.1 years.Of the cases, 29 were girls (65.9%), and 34.1% were boys. Of 70.6% (n = 12) of the cases were the last child in the family. Of 61.8% (n = 21) lived in rural areas.

While the factors that triggered the conversion in 41.2% were school/ learning stressors, in 23.5%, they were loss/ divorce /death. The rate of a visit to the doctor in the first attack was 88.4%. While 61.4% (n=27) of the patients who visited the doctor presented to the emergency department in their first attack, the same patient rate was hospitalized at the pediatric clinic.

In terms of conversion subtypes, 40.9% of the cases

had conversion type with accompanying attacks or convulsions, while 22.7% of the cases were accompanied by weakness or paralysis. Since there was missing data (n = 23), comorbid psychiatric disorders were found in 47.8% (n =21)of the cases and 11.4% had an additional physical disease.Anxiety disorders (27.3%) take the first place among psychiatric comorbidities followed by depression (20.5%). The sociodemographic and clinical features of the cases have been detailed in **Table 1.**

Table 1.Sociodemographic and clinical features of children with conversion disorder (n = 44)

	n	%
Demographics		
Gender		
Girl	15	34.1
Boy	29	65.9
Birth order		
Last child	12	27.3
First Child	3	6.8
Middle Child	2	4.5
Not-applicable (missing data)	27	61.4
Educationstatus		
Having education	37	84.1
Do not have education	2	4.5
Not-applicable (missing data)	5	11.4
If parents are alive		
Both are alive	35	79.6
Father is dead	2	4.5
Not-applicable (missing data)	7	15.9
Living area		
Rural	21	61.8
Urban	13	38.2
Marital status		
Together	30	68.2
Divorced/dead	4	9.1
Not-applicable (missing data)	10	22.7
Clinical features		
Admission to emergency		
Yes	27	61.4
None	17	38.6
Hospitalization		
Yes	27	61.4
None	17	38.6
Psychiatric comorbidity		
Yes	22	50.0
No	22	50.0
Physical comorbidity		
Yes	5	11.4
No	39	88.6
Symptoms' duration		
Shorter than 6 months	14	31.8
6 months and longer	14	31.8
Unknown	11	25.0
Not-applicable (missing data)	5	11.4
Follow-up status		
Improvement	11	25.0
Persistence	8	18.2
Unknown	1	2.3
Not-applicable (missing data)	24	54.5
Comorbid DSM-5 diagnosis		
Anxiety	12	27.3
Depression	9	20.5
Not-applicable (missing data)	23	52.2
Time until diagnosis		
In the first 1 month	20	45.5
Between 1-6 months	10	22.7
After 6 months	12	27.3
Not-applicable (missing data)	2	4.5
Family reaction		
Admission to the doctor	38	86.4
Waiting for improvement	5	11.4
Not-applicable (missing data)	1	2.2
Triggering stressor factors		
Academic problems	7	15.9
Loss/Divorce /Death	4	9.1
Physical illness	4	9.1
Family conflict/violence	3	6.8
Not-applicable (missing data)	26	59.1
Conversion subtype		
Weakness or paralysis	10	22.7
Seizure like attacks or contractions	18	40.9
Anaesthesia or sensory loss	9	20.5
Combined	7	15.9

Considering the relationships between them, the rate of parents of female cases living together (96%) was significantly higher than the rate of male cases (66.7%) (p = 0.048).School/learning stressors (50%) were the triggers for conversion in cases where parents lived together, whereas in cases where parents were divorced, or a parent had died, the triggering factor for conversion was loss/divorce/death (100%), and the difference was statistically significant (p=0.009) **(Table 2).**

The time until the diagnosis was significantly shorter in patients who had been taken to the doctor in the first attack, compared to those who had not (Fisher's Exact test, p = 0.032). While 52.8% of the applicants to the doctor were diagnosed in the first month, 80% of the late applicants, were diagnosed after 6 months due to having awaited spontaneous recovery. While 85.7% of conversion cases lasting for more than 6 months persisted, 90% of conversions that lasted less than 6 months recovered; the difference was statistically significant (p = 0.026). In addition, 71.4% of conversions lasting less than 6 months were diagnosed within the first month, whereas 85.7% of conversions lasting more than 6 months were diagnosed after 6 months (Fisher's exact test,p ≤ 0.001).

DISCUSSION

According to DSM-5, the diagnosis of conversion disorder is made when one or more symptoms related to a voluntary motor or sensory function changes is present, when there is evidence of incompatibility between clinical signs related symptoms and known neurological or general medical conditions, and when this symptom or deficiency cannot be better explained by another health condition or mental state. This symptom or deficiency causes clinically significant distress or reduced functionality(1).

The incidence of conversion disorder is between 4-12 per 100000/year. The onset is usually between late childhood and early adolescence (2). It is approximately three times more common in females than in males. Like the literature, in this study, the conversion disorder in females was approximately twice as high. Stressors include school, learning stressors, family conflict, violence, losses, death, divorce, physical diseases, traumas, and sexual abuse (8, 9). Our study also included school/learning stressors, loss/death/divorce, physical diseases, and family conflict/ violence. These data are compatible with the literature.

In conversion disorder, low socioeconomic conditions, rural living, low educational level, and accompanying psychiatric or physical disorders are among the negative prognostic factors (10, 11). Most of our cases (61.8%) were living in rural areas, consistent with the literature(12). Half of the patients had psychiatric comorbidity. The frequency of psychiatric comorbidity in children and adolescents diagnosed with conversion disorder has not been previously reported in the literature (13).The frequency of psychiatric comorbidity in adult studies was determined to be approximately 90% (14). This difference is thought to be associated with an increased prevalence of psychiatric disorders in adult patients. When a long-term follow-up study would be carried out in patients participating in our study, it is thought that the frequency of psychiatric comorbidity would be like that of the adult study when our patients reach adult life. In studies conducted in children and adolescents, anxiety and depression were frequently found in patients with conversion disorder (13). Similarly, anxiety disorder and depression comorbidities were frequent in our study. Although there is no previously mentioned data in the literature between being the last child of the family and conversion, in our study, mostly patients (70.6%) were the last child of the family. In a study, it was shown that the last child of the family did not affect the physical health of the mother, but negatively influenced her mental health (15). This is thought to lead to lower coping skills of parents when raising their children. Low coping abilities may cause poor ability to cope also with their last child. Conversion disorder is more common in children with the limited coping ability (16).

Among the types of conversion disorder, those accompanied with weakness or stroke (paralysis), unusual movement (like tremor, gait disturbance), symptoms of swallowing, signs of speech (including chattering), attacks or contractions, anaesthesia or sensory loss, sensory symptoms (seeing, smelling, hearing) and types accompanied with mixed symptoms can be counted (1). The most common symptoms of conversion are noted as contractions or convulsions, gait difficulties, and sensory disorders, respectively (17). The cases in our study most frequently presented with seizure-like attacks (40.9%), weakness (22.7%), and sensory symptoms (20.5%). These data were alike the literature.

It is known that patients with conversion disorders experience negative life events more frequently (18). While the main stressor factor that triggered conversion

Table 2.Relationship between parental marital status and stressor factors initiating conversion

	Stressors				p
	Academic problems	**Loss/ divorce / death**	**Physical illness**	**Family conflict/ violence**	
Marital status, n (%)					0.009*
Together	7 (50.0)	1 (7.1)	3 (21.4)	3 (21.4)	
Divorced/dead	0	3 (100.0)	0	0	
Missing data (NA)	0	0	1 (100.0)	0	

*Fisher'sexact test, NA: not-applicable

in cases with parents living together was school/learning stressors, the factor that triggered conversion in cases whose parents were divorced, or a parent had died was loss/divorce/death. These factors are the most immense stressors children experience. On reviewing the literature, the loss/divorce/death that causes severe family stress is among the top psychosocial stressors associated with conversion, followed by sexual abuse, physical abuse, and school failure (19). These factors were trigger factors that may have facilitated the occurrence of the disorder. Despite these factors, no diagnosis of post-traumatic stress disorder has been found in patients. Although the results obtained are consistent with the literature, the reason for school/learning stressors ranking first in the cases where the parents live together rather than other areas may be that children are away from other stressors and their families may exert pressure for academic success.

The patients presented to the doctor at the first attack at a high rate (88.4%). It was found that the diagnosis was made in a shorter time in patients who presented to the doctor in the first attack (52.8%). It was thought that this might be due to the symptoms being more easily recognized before they became complicated in the first attack. The diagnosis of conversion disorder should always be kept in mind in these presentations (20). A careful assessment is so critical. Furthermore, the shorter the time between the presence of symptoms and the diagnosis, the better the obtained result (21). While 90% of the patients diagnosed earlier than six months recovered, those diagnosed after 6 months were found to have a more chronic course. It has been shown in the literature that early diagnosis of conversion disorder is associated with a good prognosis (22). These data show that the earlier the diagnosis of conversion disorder is made, the faster the disease can recover, which widens the information in the literature in this area.

In the treatment, psychoeducation and self-help techniques are the first-line treatment choices of conversion disorder (23). Also, cognitive-behavioral therapy is successful in treating conversion disorder.The underlying theory of CBT therapy is that the disorder is based on catastrophic cognitions and inappropriate behavior. For this reason, CBT includes psychoeducation, behavioral experiments and modification of catastrophic cognitions (24, 25). Cognitive-behavioral therapy was applied to all patients in the study. In addition, antidepressant treatment was begun for patients with comorbidity. Since there was no drug use information in the patient records, pharmacotherapy was not evaluated. Eleven of the 19 patients (57.9%) who had been followed-up for 5 years showed full recovery. In the review made by Reilly et al (21), studies with 15-50 paediatric patients under follow-up showed that the remission rates ranged between 43-81%, and compared to studies with adults, higher remission rates were seen. Considering these data, similar results were obtained in our study, and approximately half of the patients were observed to have recovered.

All the patients (61%) applied to the emergency department had been hospitalized. These children applied to pediatric emergency departments with dramatic symptoms and signs. In a similar study, 65% of emergency patients were hospitalized (26). This may be caused by the long period of the pediatricians' detailed evaluation and additional examinations and their anxiety regarding misdiagnosis. Pediatricians tend to follow these patients by hospitalizing them, as they may have difficulty in eliminating serious neurological or other organic causes in an urgency. This attitude may increase patients' suspicion that they have a serious illness and may exacerbate their symptoms. On the other hand, as the diagnosis process is prolonged, the patient's relatives may show despair and anger due to the difficulties experienced. For this reason, it is imperative to make a correct diagnosis and start treatment early. On the other hand, the possibility of having organic disorders in these patients should not be ignored and the necessary investigations should be completed quickly.

There is, however, some limitation for this study. The design was retrospective evaluation in clinical examples and there was missing data in sociodemographic variablesand drug use information. These results cannot be generalized for population.

CONCLUSION

In conclusion, conversion disorder is mostly manifested by neurological symptoms and signs. Careful anamnesis and detailed neurological examination are required to distinguish this disorder from organic neurological disorders. Chronicity can be prevented by early diagnosis and treatment of these patients.

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The authors confirm that they have no conflicts of interest to disclose.

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