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RESEARCH ARTICLE

Clinical Characteristics and Demographic Correlates of Conversion Disorder in Pakistani Patients: A study from a Psychiatry Unit in PIMS Islamabad

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ABSTRACT

Background: Conversion disorder is a mental illness that presents with physical symptoms due to underlying emotional distress or conflict, commonly seen in adolescents and young adults, and often associated with other psychiatric disorders. These symptoms typically involve sensory or motor problems that resemble neurological disorders. The disorder is divided into subtypes and la belle indifference, a lack of concern about the symptoms, is a distinctive feature. Although the exact cause of conversion disorder is not fully understood, both psychological and biological factors are believed to contribute to its development. **Aim**: The aim of this study was to provide a comprehensive overview of the clinical characteristics of patients with conversion disorder seeking treatment in Pakistan. The aim was to examine predominant clinical manifestations and to determine the impact of demographic variables. **Methods:** For this study, a sample of 30 diagnosed conversion disorder patients from the Pakistan Institute of Medical Sciences was selected using non-probability sampling. Inclusion criteria stated that the patients had a diagnosis of conversion disorder, were between 15 and 45 years of age and were receiving psychiatric treatment. Patients with medical conditions other than psychiatry were excluded. Data collection involved the use of a demographic information collection form and a symptom checklist. Statistical analysis consisted of calculating the frequency and percentage of symptoms experienced by the patients in the sample. **Results:** Among the patients, the majority were female (70%), unmarried (63.3%), and of low socioeconomic status (63.3%). The most frequently reported symptoms were unconsciousness (29%) and paralysis (26.4%). The duration of episodes varied from less than an hour to over 4 weeks, with the majority lasting between 1 and 24 hours (37.5%). Motor symptoms were mainly expressed as localized weakness or paralysis (13.3%), while sensory symptoms were commonly reported as headaches (16.7%). **Conclusion:** In summary, the analysis found that seizures were the most frequently reported subtype among the four conversion disorder subtypes. Seizures and convulsions were the predominant symptoms of conversion disorder with localized weakness and headache. Motor symptoms mainly took the form of localized weakness, while sensory symptoms often took the form of headaches.

Keywords: Conversion Disorder, La Belle Indifference, Emotional Distress, Motor Symptoms, Psychiatric Disorders

INTRODUCTION

Conversion disorder is a condition characterized by the manifestation of physical symptoms caused by emotional stress or unconscious conflict. Although it can occur at any age, it is most commonly seen in adolescents and young adults [1]. The prevalence of this disorder is higher in rural populations, those with low education and those with low socioeconomic status [2]. In addition, conversion disorder is often associated with co-existing conditions such as major depressive disorder, anxiety disorders, and schizophrenia. Cultural factors can also influence the way anxiety symptoms are expressed [3]. The symptoms of conversion disorder can vary, but typically involve the conversion of emotional distress into physical symptoms resembling those of neurological disorders, such as sensory or motor disorders. Failure to use a body part or system can lead to complications. The disorder includes subtypes with specific symptoms, including motor symptoms, sensory symptoms, seizures or convulsions, and a combination of symptoms [4]. La belle indifference is a notable feature of conversion disorder, in which patients appear unconcerned about their symptoms despite distressing feelings.

In addition, several theories have been proposed to explain the origin of conversion disorder. A prominent theory, rooted in Freudian psychoanalysis, holds that the disorder arises from the conversion of repressed instincts into physical symptoms [5]. However, new evidence suggests that biological and neuropsychological factors may also contribute to the development of conversion disorder symptoms. The article also discusses the evolving understanding of hysteria and highlights the distinction between hysterical symptoms and psychophysiological disorders [6]. In addition, the mechanism underlying conversion disorder involves the conversion of emotional experiences into physical symptoms as a result of detachment from intolerable thoughts [7]. The article concludes with the question whether conversion disorder represents a certain process, a specific mechanism for the development of hysterical symptoms, or differs from translation. The existing literature on conversion disorder shows gaps in knowledge regarding the typical clinical symptoms observed in male and female patients, the influence of demographic variables on the frequency of the disorder, and the specific influence of cultural factors [8]. Closing these gaps through further research is crucial to advance our understanding of conversion disorder and to develop improved diagnostic and treatment approaches [9].

To fill these gaps, the main aim of the present study was to provide a comprehensive overview of the clinical characteristics of patients diagnosed with conversion disorder who seek treatment at the Pakistan Institute of Medical Sciences (PIMS) Psychiatry [10]. In particular, the study aims to identify the most common clinical manifestations and types of symptoms that occur in both male and female patients. In addition, it will be investigated how demographic variables such as age, gender, education level, employment and socioeconomic status affect the incidence of conversion disorders. The study also provides a brief overview of somatoform disorders, conversion disorders and their epidemiology to provide a contextual framework for the research findings [11]. By examining predominant clinical presentations, demographic variables, and cultural factors, this study attempts to fill the existing knowledge gaps in the field of conversion disorder. The resulting insights can contribute to the development of more effective diagnostic and treatment strategies while improving our overall understanding of the disease [12].

MATERIAL AND METHODS

The study used a specific research methodology to study conversion disorders and focused on a sample of 30 patients diagnosed with PIMS. The sample size was determined using the formula n=zPq allowing for a deviation error of 0.05 and a tolerance error of 5% (0.01-0.1). The test subjects were selected on the basis of predetermined criteria by targeted random sampling without probability. The inclusion criteria included males and females between the ages of 15 and 45 with diagnosed conversion disorder and exclusively psychiatric patients. Patients with non-psychiatric disorders were excluded from the study. Various tools were used in the research, including a pro forma to collect demographic information, a symptom checklist, and the diagnostic criteria for conversion disorders described in the DSM-IV. The data collection extended over a period of two months. Statistical analysis involved calculating the frequency and percentage of symptoms experienced by the patients in the sample.

RESULTS

Table 1 provides a demographic analysis of study participants, showing the frequency and percentage of individuals in different categories. The first column identifies the demographic factors studied, such as gender, age group, marital status, education, employment, and socioeconomic status. The second column shows the number of participants that fall into each category, while the third column shows the corresponding percentage. For example, the table shows that of the 30 research participants, 9 (30%) were male and 21 (70%) were female. Regarding the age range, 19 people (63.3%) fell into the 15 to 25 age group, 5 (16.7%) were between 26 and 35 years old and 6 (20%) were between 36 and 45 years old . In addition, the table shows that 11 participants (36.7%) were married, while 19 (63.3%) were unmarried. Regarding education, 10 participants (33.3%) had no formal

education, 3 (10%) had elementary education, and 3 (20%) had education below metric level. In addition, 6 people (13.3%) had a completed metric education, 4 (16.7%) had an upper secondary education, and 1 (3.3%) had a bachelor's or master's degree. In terms of employment, 9 participants (30%) were employed while 21 (70%) were unemployed. The table also shows that 19 participants (63.3%) had low socioeconomic status, 8 (26.7%) had lower middle socioeconomic status, and 3 (10%) had middle socioeconomic status. Overall, this table provides a concise overview of the demographics of the participants that can be analyzed in relation to the research variables.

Table 2 presents the pattern of symptoms within a given population or group, showing various symptoms reported by individuals, their frequency, and percentages. The table provides insight into the prevalence and distribution of different symptoms within the population. For example, 11 people reported unconsciousness, which is 29% of the general population. Also, 10 people were reported paralyzed, which is 26.4% of the population. This table is helpful in understanding the prevalence of symptoms and can assist healthcare professionals in diagnosing and treating people with similar symptom profiles by identifying the most commonly reported symptoms in the population.

This Table 3 shows the frequency and percentage distribution of the duration of the episodes and the length of hospital stay of the patients. The duration of the episodes is divided into different periods ranging from less than an hour to four weeks, with corresponding frequency and percentage distribution. For example, 10 patients had an episode lasting less than an hour, accounting for 25% of the total population. On the other hand, only 1 patient had a 4-week episode, accounting for 2.5% of the total population.

Likewise, the duration of the hospital stay is divided into three periods, i. H. 1-3 days, 4-7 days and more than 7 days, with the corresponding frequency and percentage distribution. For example, 12 patients were hospitalized for 1-3 days, accounting for 30% of the total population. Meanwhile, 17 patients were hospitalized for more than 7 days, which corresponds to 42.5% of the total population. This table is useful for understanding the duration of episodes and the length of time patients are hospitalized. It can be helpful in planning appropriate medical interventions, including treatment and care, for patients with different episode durations and lengths of hospital stay.

This Table 4 provides a comprehensive overview of conversion disorder symptoms with information on the frequency and percentage of each symptom. The table provides an important summary of the symptoms presented in patients with conversion disorder and may be useful to clinicians, researchers, and others interested in understanding the prevalence and distribution of these symptoms. Analysis of this table can help identify the most common symptoms associated with conversion disorder, which can aid in the development of treatment strategies and interventions for patients. In addition, the table can be used to compare the prevalence of different symptoms in different studies, leading to a more complete understanding of this complex disorder. This table shows the frequency and percentage of various conversion disorder symptoms. The first column lists the symptoms, which include seizures, headaches, localized weakness, impaired coordination, body aches, mixed appearance, aphonia, tremors, gait disturbances, and joint pains. The second column shows the frequency of each symptom, i.e. H. the number of patients who experienced this symptom. For example, 5 patients had seizures, 4 patients had headaches, and so on. The third column shows the percentage of patients who experienced each symptom. For example, 16.7% of patients had seizures, 13.3% of patients had headaches, and so on. Percentages were calculated by dividing the frequency of each symptom by the total number of patients and multiplying by 100. Overall, this table provides a quantitative summary of the symptoms presented in patients with conversion disorder, which may be useful for analyzing and comparing other studies.

Table 1. Demographic Analysis of Research Participants

Characteristic	Frequency	Percentage
Sex		
Males	9	30%
Females	21	70%
Age Range		
15-25	19	63.30%
26-35	5	16.70%
36-45	6	20%
Marital Status		
Married	11	36.70%
Unmarried	19	63.30%
Education		
Nil	10	33.30%
Primary	3	10%
Under Metric	3	20%
Metric	6	13.30%
F.A	4	16.70%
B.A	1	3.30%
M.A	1	3.30%
Employment		
Employed	9	30%
Unemployed	21	70%
Socioeconomic Status		
Low	19	63.30%
Lower Middle	8	26.70%
Middle	3	10%

Table 2. Pattern of Symptoms and Their Frequencies.

Symptoms	Frequency	Percentage
Loss of consciousness	11	29%
Paralysis	10	26.4%
Fit	8	21.1%
Aphonia	8	21.1%
Abnormal movements	7	18.4%
Weakness	5	13.20%
Loss of sensation	1	2.60%
Unable to urinate	1	2.60%

Table 3. Frequency and percentage distribution of the duration of episodes.

Duration of the Episode	Frequency	Percentage
≤I hour	10	25%
1-24 hours	15	37.50%
≥1 day-7 days	5	12.50%
1 week-4 weeks	9	22.50%
4 weeks	1	2.50%
Length of Hospitalization		
1-3 days	12	30%
4-7 days	11	27.50%
>7 days	17	42.50%

Table 4. The Prevalence Rate of Reported Symptoms.

Symptoms	Frequency	Percentage
Fits	5	(16.7%)
Headache	4	(13.3%)
Localized weakness	4	(13.3%)
Impaired coordination	2	(6.7%)
Body pains	2	(6.7%)
Mixed presentation	2	(6.7%)
Aphonia	1	(3.3%)
Tremors	1	(3.3%)
Gait disturbance	1	(3.3%)
Joint pain	1	(3.3%)

The Table 5 shows the frequency and percentage of various motor symptoms in patients. The first column lists the various motor symptoms, including paralysis or localized weakness, impaired coordination, or balance, aphonia, gait disturbance, and tremors. The second column shows the frequency and percentage of each motor symptom. For example, 4 patients experienced paralysis or local weakness, representing 13.3% of the patient population. Also, one patient suffered from aphonia, gait disturbance, and tremor, each accounting for 3.3% of the patient population. This table provides a brief summary of motor symptoms observed in patients and may be helpful to clinicians and researchers interested in understanding the prevalence and distribution of these symptoms.

Table 5. Frequency and Percentages of Motor Symptoms.

Motor Symptoms	Frequency	Percentage
Paralysis or Localized weakness	4	(13.3%)
Impaired coordination or balance	2	(6.7%)
Aphonia	1	(3.3%)
Gait Disturbance	1	(3.3%)
Tremors	1	(3.3%)

The table 6 shows that 16.7% of patients experienced Headaches, 6.7% experienced Body Pains, and 3.3% experienced Joint Pain.

Table 6. Frequency and Percentage of Sensory Symptoms.

Sensory Symptoms	Frequency	Percentage
Headaches	5	(16.7%)
Body Pains	2	(6.7%)
Joint Pain	1	(3.3%)

DISCUSSION

The aim of this study was to examine and research the occurrence and clinical presentation of conversion disorder in Rawalpindi and Islamabad. The study also examined the most commonly reported symptoms and subtypes of conversion disorder based on associated symptomatology. Conversion disorder, as defined by the American Psychiatric Association (1994), is characterized by the presence of symptoms or impairments of voluntary motor or sensory function that resemble neurological or general medical disorders. However, these symptoms cannot be fully explained by physical illnesses, substances, or other mental disorders [13–16]. While the definition of conversion disorder has remained consistent, the diagnostic criteria have evolved. The DSM-5 (American Psychiatric Association, 2013) places greater emphasis on subjective distress and psychological factors in the development and maintenance of conversion disorder symptoms [17-20]. The DSM-5 also introduced new criteria for conversion disorder with psychological symptoms to capture the role of emotional and cognitive factors in the disorder [21, 22].

The most common conversion symptoms resemble neurological disorders and involve sensory or motor functions. These symptoms include paralysis, loss of voice (aphonia), seizures, incoordination, blindness, tunnel vision, anesthesia, abnormal sensations (paraesthesia), lack of voluntary movement (akinesia), and abnormal involuntary movements (dyskinesia) [23]. The results of this study showed that seizures were the most commonly reported symptom of conversion disorder, occurring in 56.7% of cases. 16.7% of patients reported headache while 15.3% reported localized weakness. Balance disorders and body aches were equally reported at 6.7%, and aphonia, gait disturbances, tremors, joint pain, paralysis, and headache were the least reported symptoms at 3.33% each.

The study results were consistent with previous research that highlighted seizures as a common symptom in conversion disorders. However, the prevalence of other symptoms such as headache and local weakness differed from previous studies [24, 25]. It is important to acknowledge that factors such as sample size and patient characteristics may have influenced the results, underscoring the need for further research to better understand the variability in conversion disorder symptoms [26,27]. The study also looked at the frequency and percentage of symptoms reported in each category and showed that seizures and convulsions, including seizures, were the most commonly reported. The most frequently reported conversion disorder subtype was with motor symptoms (30%), followed by sensory symptoms (26.7%). The mixed presentation subtype had the lowest reported frequency (6.7%). Comparing these results with relevant national and international studies, the prevalence of conversion disorder with seizures as the most common subtype is consistent with previous reports [28]. However, the proportion of patients with motor and sensory symptoms in this study appeared to differ from previous studies, possibly reflecting differences in sample size, patient characteristics, and diagnostic criteria. Conducting future studies with larger and more diverse patient populations would help clarify these differences and further improve our understanding of conversion disorder subtypes and symptoms [29].

Another study conducted by the Department of Psychiatry at Ayub Medical College; Abbottabad focused on the symptomatology of conversion disorder in patients [30]. This study aimed to identify the most common symptoms of conversion disorder in patients attending the psychiatric department of Ayub Teaching Hospital, as no such study had previously been conducted there [30]. A total of 100 consecutive patients of both sexes were selected and diagnosis was based on DSM-IV criteria [30]. The results showed that 35% of patients had pseudo-seizures, 1% paralysis, 12% tremors, 8% aphonia, and 5% each of gait disturbances and dysphagia. In addition, 5% suffered mutism and headache/pain, 4% suffered blindness, and 3% suffered from anesthesia. Comparing these results with contemporary studies revealed significant differences in the symptoms of conversion disorder seen in this population compared to others. The studies conducted by the Psychiatric Department of Dow Medical College in Karachi and Civil Hospital Karachi focused on the association of psychopathology and conversion disorder [31]. Patients with conversion symptoms who attended the Psychiatric Department of Karachi Civil Hospital were included in the study over a one-year period.

Demographic details such as age, gender, marital status, education, occupation, symptom presentation and duration, presence of physical pathology, associated psychopathology, and response to treatment were recorded. Results showed that motor symptoms were the most common symptom of conversion disorder (45.5%), followed by sensory symptoms (29.5%) and mixed symptoms (25%). Associated psychopathology was present in 68.2% of patients, with anxiety being the most common. The study concluded that the presence of associated psychopathology may contribute to the severity and chronicity of conversion disorder [32, 33]. Compared to the studies conducted in Pakistan, the initial investigation by Dr. Yousatzai, Aziz-Ur-Rahman, Dr. Irfan and Naveed found that pseudo-seizures are the most common symptom (35%), followed by tremors (12%) and aphonia (8%), which differs from the results of the second study by Dr. Matine and Dr. Idris differed [31]. In the latter study, motor symptoms were reported as the most common symptom (45.5%). However, both studies suggest that the symptomatology of conversion disorder may vary based on cultural factors, demographics, and associated psychopathology.

In addition, a study by Guo et al. (2014) examined the subtype distribution of conversion disorder in China and found that the motor subtype was the most common (41.5%), followed by the mixed subtype (32.2%) and the sensory subtype (26.3%). This study also found that patients with conversion disorder were more likely to have comorbid psychiatric disorders such as depression and anxiety compared to the general population [34]. Similarly, a study by Kugu et al. conducted study. (2005) reported that paralysis was the most common symptom of conversion disorder (29%), followed by tremors (20%) and sensory symptoms (16%) [35]. This study also observed a higher prevalence of conversion disorder among women and those with a lower level of education. Taken together, these studies suggest that the symptomatology of conversion disorder may vary depending on cultural factors, demographics, and associated psychopathology [35]. In addition, the prevalence of different subtypes and symptoms of conversion disorder may vary by country and region.

The aim of the present study is to investigate the clinical appearance and frequency of conversion disorders specifically in the context of Rawalpindi and Islamabad. The results of the study indicated that seizures were the most commonly reported symptom of conversion disorder, with the seizures or convulsions subtype being the most commonly reported. However, it is important to note that more research is needed to better understand the variability in conversion disorder symptoms. Comparing the results of the study with two other studies conducted in Pakistan, it becomes clear that the symptoms of conversion disorder can vary in different population groups. Additionally, the presence of associated psychopathology may contribute to the severity and chronicity of conversion disorder. The results of the study are consistent with previous reports of conversion disorder symptoms, but may differ due to differences in sample size, patient characteristics, and diagnostic criteria.

CONCLUSION

Based on the analysis, it can be concluded that among the four conversion disorder subtypes, seizures were the most commonly reported subtype. This indicates that seizures and convulsions were the most common symptoms of conversion disorder. In addition, the analysis suggests that localized weakness and headache were significant symptoms observed in patients with conversion disorder. Localized weakness represented motor symptoms, while headaches indicated sensory symptoms. In summary, the analysis emphasizes that seizures were the most commonly reported symptom subtype in patients with conversion disorder.

REFERENCES

1.   Verma, A., et al., Emotional distress among adolescents living with perinatal HIV in India: examining predictors and their mediating and moderating effects. Child Adolesc Psychiatry Ment Health, 2023. 17(1): p. 40.

2.   Ueda, M., K. Watanabe, and H. Sueki, Correction: Emotional Distress During COVID-19 by Mental Health Conditions and Economic Vulnerability: Retrospective Analysis of Survey-Linked Twitter Data With a Semisupervised Machine Learning Algorithm. J Med Internet Res, 2023. 25: p. e47549.

3.   Sumbal, A., M.M.A. Baig, and R. Sumbal, Impact of mystical belief and traditional healing on the health-seeking practice of conversion disorder in middle- and low-income countries. Ann Med Surg (Lond), 2023. 85(3): p. 567-568.

4.   Spagnolo, P.A., et al., Methylome changes associated with functional movement/conversion disorder: Influence of biological sex and childhood abuse exposure. Prog Neuropsychopharmacol Biol Psychiatry, 2023: p. 110756.

5.   Peeling, J.L. and M.R. Muzio, Conversion Disorder, in StatPearls. 2023: Treasure Island (FL).

6.   Nagata, R., et al., Anti-ganglionic acetylcholine receptor antibodies in functional neurological symptom disorder/conversion disorder. Front Neurol, 2023. 14: p. 1137958.

7.   Li, X., X. Wang, and G. Zhou, Heterogeneity of emotional distress in pregnancy during COVID-19 pandemic: a latent profile analysis. J Reprod Infant Psychol, 2023: p. 1-12.

8.   Kuzkina, A., et al., Dermal Real-Time Quaking-Induced Conversion Is a Sensitive Marker to Confirm Isolated Rapid Eye Movement Sleep Behavior Disorder as an Early alpha-Synucleinopathy. Mov Disord, 2023.

9.   Geng, W., et al., Emotional distress and burnout at a fever clinic in China: Comparison between different periods of COVID-19. Front Psychiatry, 2023. 14: p. 1138361.

10.   Daly, M. and L. Macchia, Global trends in emotional distress. Proc Natl Acad Sci U S A, 2023. 120(14): p. e2216207120.

11.   Chung, J., S. Mukerji, and K. Kozlowska, Cortisol and alpha-amylase awakening response in children and adolescents with functional neurological (conversion) disorder. Aust N Z J Psychiatry, 2023. 57(1): p. 115-129.

12.   Ashrafzadeh, S., M.T. Mariano, and S. Syed, Cushing's Disease Presenting with Functional Neurological (Conversion) Disorder. Case Rep Psychiatry, 2023. 2023: p. 1662271.

13.   Zou, W., et al., Global hippocampus functional connectivity as a predictive neural marker for conversion to future mood disorder in unaffected offspring of bipolar disorder parents. Asian J Psychiatr, 2022. 78: p. 103307.

14.   Zhou, L., et al., Personality profile and its association with conversion to neurodegenerative disorders in idiopathic REM sleep behavior disorder. NPJ Parkinsons Dis, 2022. 8(1): p. 91.

15.   Yang, L., et al., The Mediating Role of Perceived Stress and Academic Procrastination between Physical Activity and Depressive Symptoms among Chinese College Students during the COVID-19 Pandemic. Int J Environ Res Public Health, 2022. 20(1).

16.   Xu, Z., et al., A Predictive Model of Risk Factors for Conversion From Major Depressive Disorder to Bipolar Disorder Based on Clinical Characteristics and Circadian Rhythm Gene Polymorphisms. Front Psychiatry, 2022. 13: p. 843400.

17.   Wen, D., et al., Disorder-Order Conversion-Induced Enhancement of Thermal Stability of Pyroxene Near-Infrared Phosphors for Light-Emitting Diodes. Angew Chem Int Ed Engl, 2022. 61(28): p. e202204411.

18.   Tolsdorf, E.L., et al., Conversion to major neurocognitive disorder after COVID-19 in a woman with bipolar disorder: A 6-year longitudinal case report. Bipolar Disord, 2022. 24(4): p. 451-456.

19.   Teodoro, T., et al., No Man's Land Between Psychiatry and Neurology: Functional Neurological Disorders and Conversion Disorder in Emergency Department Settings. Psychiatr Danub, 2022. 34(1): p. 109-110.

20.   Tahir, F. and R. Sadiq, Automatic negative thoughts as contributing factors to adults with conversion disorder. J Pak Med Assoc, 2022. 72(9): p. 1708-1711.

21.   Soler, C.T., et al., Exploration of the Moderating Effects of Physical Activity and Early Life Stress on the Relation between Brain-Derived Neurotrophic Factor (BDNF) rs6265 Variants and Depressive Symptoms among Adolescents. Genes (Basel), 2022. 13(7).

22.   Serier, K.N., et al., Analysis of the bidirectional relationships between posttraumatic stress and depression symptoms with physical health functioning in post-9/11 veteran men and women deployed to a war zone. J Psychosom Res, 2022. 162: p. 111034.

23.   Kaplan, H.I., B.J. Sadock, and J.A. Grebb, Kaplan and Sadock's synopsis of psychiatry: Behavioral sciences, clinical psychiatry. 1994: Williams & Wilkins Co.

24.   Nanlohy, J.F., [A patient with conversion disorder and choking phobia]. Ned Tijdschr Tandheelkd, 2022. 129(11): p. 498-502.