Conversion Disorder in Children and Adolescents: Definition, Diagnosis, Treatment, and Clinical Illustration

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ABSTRACT

Conversion disorder is defined by neurological symptoms (paralysis, tremor, aphonia) that cannot be explained by an organic pathology. There is little literature on this disorder in children and adolescents. The exact prevalence is unknown, and the etiology can be described from a systemic, psychoanalytic, and neurobiological perspective. Symptoms are often related to a stressful life event. It is important to distinguish conversion disorder from simulation. The cooperation between somatic practitioner and child psychiatrist is essential to make a diagnosis and to set up the therapy management. There is no specific treatment, but a multidisciplinary approach combining psychotherapy and functional rehabilitation seems to be the best option.

Keywords: Children, Adolescent, Conversion Disorder.

Introduction

Conversion disorder is defined by neurological symptoms (paralysis, tremor, aphonia) that cannot be explained by an organic pathology.

There is little literature on this disorder in children and teenagers, and most are case reports. In each case, different methods are used, and populations are not comparable, the exact prevalence remains unknown.

The clinical expression of this disorder is heterogeneous, it requires a complete neurological clinical examination as well as negative results in additional examinations.

This disorder confronts the physician with fear of missed diagnosis that can lead to additional examinations over prescription. Given the lack of organic causes, it can also increase attitudes of aggression and rejection towards the patients, even leading to abandonment of treatment [1].

It is crucial for the patient and his entourage to understand that the conversion disorder can origin from psychological roots in the complex interactions between the mind and body. An unconscious stress factor, usually unknown to the patient, triggers an emotional response that is then converted into a physical symptom. To build trust, it is essential to let the patient know that the symptoms are real, it does not simulate or intentionally amplify them [2].

The purpose of this article is to consolidate and summarize our knowledge of this disorder through its definition, diagnosis, and management. We will end with the illustration with a clinical case.

Characteristics of Adolescent Conversion Disorder

Epidemiology

This disorder most often appears between the age of 12 and 16 and is rarely seen before the age of 7. Our hypothesis it that before 7, the child can externalise impulses. It’s in agreement with his affective development. 12 to 16-year-old is also the puberty age and the adolescent has to deal with hormonal imbalance and its consequences.

As for adults, it mainly affects women rather than men, with a ratio of 3:1 for those over 10 years old. Under 10, the ratio goes back to 1:1 [2,3].

The exact prevalence of this disorder is unknown, but some estimate it between 10 to 500/100000 per year [4,5], while others between 2 and 22/100000 per year [6]. Among neuropediatric
patients, it ranges from 0.5% to 2% [7]. It is estimated between 5% to 14% of in-patients and 5% to 25% of psychiatric out-patients [2].

Variations in the estimation of prevalence can be explained by various factors: the diversity of the populations studied (hospital or external consultation), the level of awareness of the medical teams on the existence of this disorder, the socio-cultural environment (rural areas or patriarchal family for instance), the sampling technique, and the selected diagnostic criteria [1,7].

Psychiatric comorbidities are common (50 %, or even 60 % according to studies [8]), the most observed ones being anxiety disorders and major depressive episodes [3,5,9,10]. Somatic comorbidities can exist as well.

Diagnostic criteria for DSM V are characterized by motor symptoms (paresis, paralysis, abnormal movements) or sensory symptoms (skin, visual or auditory sensations impairments), so-called psychogenic or non-epileptic seizures (abnormal generalized tremors of the limbs go along with impairment or loss of consciousness), episodes of fainting unconsciousness, or other symptoms such as dysphonia, aphonia, dysarthria, globus or diplopia [11].

Younger children show negative symptoms (loss of function, such as weakness, imbalance, or loss of vision). Positive symptoms, such as non-epileptic seizures and psychogenic movement disorders, only occur in puberty or older children [2].

Symptoms develop brutally and are often linked to a stressful event [11].

Risk factors

For adults, a history of sexual or physical abuse is common. For children, the most common stressful life events are family conflicts, a change in family situation (new member or separation of a family member), academic difficulty (relationship problem with peers or poor academic performance) or harassment. Unlike adults, a history of sexual or physical abuse is less common and does not appear to be a predisposing factor [12,13].

A study in Turkey compared 52 teenagers aged between 12 and 18 with a conversion disorder to patients with other psychiatric disorders (except psychotic disorder and mental retardation). It showed that coming from a rural area, having separated parents, having been separated from parents for at least 6 months, having a history of conversion disorder in the surrounding environment and a mother with a history of psychiatric disorders is associated with significant incidence of conversion disorder in adolescents. However, there was no significant association between the diagnosis of conversion disorder and the number in the siblings, academic success, corporal punishment at home, or the existence of a somatic pathology in the adolescent or his parents [14].

Both patients with conversion disorders and their parents often have a history of chronic health problems with unexplained medical symptoms. Patients tend to have good behaviors at home and school and are often high-performing students without any conflicts with figures of authority. Most of the time, they deny the presence of stressors in their lives. Other common characteristics among parents include knowledge of medical terminology or the health system, a strong belief that the child’s symptoms are biological in nature and a strong reluctance to accept the contribution of psychosocial factors to the child’s symptoms [2].

Diagnosis

In order to make the diagnosis, it is necessary to prove an incompatibility between the clinical signs and a neurological disease. Moreover, if the symptoms can be fully explained by a particular cultural context and do not cause significant distress or disability, the diagnosis of conversion disorder will not be made [11].

The DSM V diagnosis requires evidence by the clinician of the preserved physiological function, but no longer requires a temporal relationship between a psychological factor and the onset or aggravation of the pathology unlike the DSM IV [1].

It is also important to differentiate between a conversion disorder and a simulation. In simulation cases, the production of symptoms and the underlying motivations are conscious, while in conversion disorder they are unconscious [4].

Ideally, physician and child psychiatrist should announce the diagnosis together.

Etiological hypothesis

- Neurobiological Perspective

The neurobiology of this pathology is not well understood, and etiopathogenic mechanisms are unknown, but there are some descriptive imaging studies.

In patients with unilateral conversive paralysis, imaging studies show hypoactivity of the motor cortical areas and hyperactivity of the prefrontal regions when attempting to perform the movement. These prefrontal regions would have an inhibitory effect on the primary motor cortex and would be the cause of the conversive symptom [4].

A single photon emission tomography study in 2001 analyzed 7 patients with a unilateral sensory-motor deficit in which passive vibration-like stimulation was applied on the healthy and affected side. It showed hypoactivity in the thalamus and the basal ganglia (caudate nucleus and putamen) contralateral to the affected limb that normalized after the regression of symptoms. The disorder could therefore be explained by an anomaly of regulation of voluntary motor executive processes mediated by striato-thalamo-cortical circuits [4].

In 2014, a study by Aybek et al found hyperactivity in the right supplemental motor area and the right tempo-parietal junction, as well as increased activity between the amygdala and the supplemental motor area suggesting a “conversion” of a suppressed memory into a somatic symptom [15-19].
A brain imaging study conducted in 25 patients (including 20 girls), all with a history of stressful life events (family conflict, abuse, illness,...) showed the following results: the volume of the grey matter was greater in patients compared to the control group in the additional left motor area, the upper temporal gyrus, and the right dorso-median prefrontal cortex. Larger volumes of these regions may reflect the early expression of a process of plasticity dependent experience, associated with increasing alertness to the emotional states of others and increased motor will, in the context of traumatic events and chronic relationship stress [20].

Research has shown hypoactivation of the contralateral parietal lobe in patients during movement or mentalization, thus showing a link between the psychic and the physical. The hypoactivation of the postero-polar part of the parietal lobe during movement but not during its mentalization clearly demonstrated the involuntary character of the symptoms, while hyperactivation is observed in simulation [21].

It is difficult to establish a unified neurobiological model to explain the production of the converging symptom: studies are carried out with small numbers of subjects, among which there is a significant heterogeneity (in terms of symptoms and comorbidities), and they use different paradigms and methodologies [4].

In children and adolescents, research suggests that the disorder occurs when life events lead the biological system of the child or adolescent to change into a cerebral-bodily state of a high level of arousal and voluntary motor skills. The connection between the brain regions involved in the process of emotions and those involved in the movement and representation of sensory information would be increased, generating unusual sensory-motor symptoms in a stressful context [9].

**Systemic Perspective**

Conversion disorder may have its origin in a family problem. The family environment plays an important role in the beginning and maintenance of hysterical manifestations: it is often conservative (with excessive overprotecting mechanism), sealed, geographically isolated, large, or with limited financial resources families. The symptoms are therefore used to attract the attention of those around the patient, to make someone love him, or to find a solution to the family or school conflict [7].

As stated above, coming from a rural setting, having separated parents, or having been separated from parents at least 6 months are risk factors for conversion disorder in adolescent [14].

Another hypothesis would be that it is a leap from the psychic to the somatic which makes children reproduce a symptom observed in others. Imitation may appear as the only means of communication to allow these children to hope for care or attentions from their peers. The last systemic hypothesis is the emotional tuning: the child must maintain a consistent physical tension to have enough excitement, attention and stay connected [7].

**Psychoanalytic point of view**

J Laplanche and J.B. Pontalis define conversion as «a transposition of a psychic conflict into an attempt to resolve it in somatic symptoms» [17] Patients therefore express repressed representations throughout the body.

Conversion disorder would be a neurotic symptom, underpinned by a conflict resulting from the opposition of the unconscious and conscious systems, the principles of pleasure and reality, the impulses of life and death [18].

According to Freud, when thoughts or desires are unacceptable to the subject and cannot be sufficiently repressed, there is a shift of these thoughts to a part of the body through the expression of somatic symptoms: hysterical conversion would therefore be due to repression [7].

Freud and Breuer (in 1893) hypothesize that hysterical symptoms are caused by a psychological trauma. The painful memory of this trauma is repressed by the patient. The psychic energy associated with this trauma is therefore converted into somatic energy and gives rise to a symptom: the conversion disorder is thus due to an intolerable affect transformed into somatic symptoms [4].

Conversion can also be explained by a repressed sexual urge that is displaced into a functional disorder [7].

Finally, this disorder could be explained by a conversion of anxiety into physical dysfunction and would therefore be a poorly adapted defense against anxiety. The self defense mechanisms would oppose the instinctual behavior to «refuse» anxiety, and the symptoms would emerge from a compromise between the impulse and the defense [18]. The conversion disorder therefore marks the success of the defense against anxiety [16].

**Management**

There is no specific treatment, but a multidisciplinary approach combining psychotherapy (cognitive behavioral therapy, psychoeducation, and relapse prevention strategies) and functional rehabilitation (physiotherapy and occupational therapy) seems to be the best option.

Physiotherapy allows patients to transform their perception of the disease into a reversible, treatable, and non-organic state, in addition to help restore their body function. They are also taught relapse-prevention strategies that identify symptom-triggering factors and implement techniques to prevent the emergence of symptoms. For instance, if the patient is restricted in its movement because of a muscular stiffness, the physiotherapist will teach it muscle relaxation techniques to improve his flexibility and mobility. The intensity and educational component will help the patient. This will show the patient their ability to perform normal movements, educates them about their condition, and helps them to limit inappropriate motor responses [6].

The physician should always keep an open mind and reconsider the diagnosis if there is no improvement with
psychiatric management. It seems important to educate the patient on mind-body interactions. The involvement of related health professionals such as physiotherapists and occupational therapists is crucial in this type of management. Hospitalization may be suggested in more serious cases, particularly if the patient has suicidal ideation, catatonia, or amnesia. Further attention should be paid to the presence of medical, neurological, or psychiatric comorbidities. It is important to take the patient’s complaints seriously and give them hope of improving their condition to return to a normal life. Finally, the patient has to be reassured, and free from any feeling of shame [15].

No studies have proven the effectiveness of antidepressants but in case of psychiatric comorbidities it may be necessary to add a pharmacological treatment [8].

Randomized studies have shown the effectiveness of cognitive-behavioral therapy through psychoeducation, stress management techniques, new behavioral responses, and through help to identify and change thoughts that strengthens their symptoms [14]. It also helps to learn to observe triggering events, focus on negative movements, identify “pre-crisis auras”, manage life stresses, manage internal conflicts and problems, learning to reduce tensions, and maintain control [6].

Hypnosis has been found effective in patients with chronic or acute pain, but with regards to conversion disorder the evidence of effectiveness is limited as there are fewer studies and they are anecdotal [6].

Other treatments have been cited but have not been proven by randomized controlled studies (psychodynamic psychotherapy, mindfulness, and magnetic transcranial stimulation).

The psychic aspect is certainly important, and it is necessary to make the patient understand the link between the psychic and the somatic, but the physical treatment is also important. It is a functional disorder, and therefore requires functional rehabilitation. This joint work of rehabilitation-psychiatrist helps to limit declining [16].

**Prognosis**

The prognosis is favorable. Half of the patients recover spontaneously by simple reassurance from the treating physician. A disappearance of the symptomatology is observed in 70 to 92% of cases, based on a follow-up of 1 to 6 years. A younger age, longer diagnostic time, and a higher frequency of seizures are found among patients evolving quite unfavorably, but there is no significant difference with patients who no longer have any symptoms [3].

The presence of psychiatric comorbidity at the time of diagnosis does not seem to be associated with a more adverse evolution, only pre-morbid conduct disorder (aggressiveness toward people or animals, destruction of physical assets, fraud or thievery, serious violation of established rules) was associated with a lower cure rate. According to studies, the presence of psychiatric comorbidities appears between 28 and 41% after the conversive episode. In addition, if there is an onset or persistence of remote psychiatric comorbidity, the impact on the youth as well its evolution is more adverse. There are few studies on psychiatric comorbidities during follow-up, yet conversion disorder minimizes anxiety and may unveil another psychiatric pathology, which would become obvious after improvement of conversive symptoms [3].

A study of 40 patients showed that a full recovery was significantly more common in patients without behavioral disorders before the disease: in addition, in these patients, the healing time was shorter, and they had better academic results. All patients without full recovery had comorbidities (anxiety or mood disorder) but there was no significant difference between the 2 groups (complete healing or not) about gender, age, types of symptoms, triggers, an anxiety disorder or associated mood disorder [5].

Factors associated with a positive development are early age, early diagnosis, a good (close) relationship between pediatricians and child psychiatrists, the presence of a stressor, and the collaboration of the child and his or her family. Factors associated with negative evolution are polysymptomatic presentation, chronic symptoms, comorbidity with a medical or psychiatric disorder, poor comprehension capacity, internal conflict, and severe family dysfunction [5].

**Clinical case**

We will now describe the case of a 14-year-old patient who was admitted into the child psychiatry unit at Erasme hospital in Brussels for a conversion disorder.

Approximately one year before the hospitalization, she had abdominal pain with intermittent diarrhea and vomiting, for six weeks.

A few weeks after the resolution of symptoms, during a family trip in Egypt, she experienced vomiting, diarrhea, and fever. Upon her return home, she suffered from constipation and was hospitalized to be treated by enemas.

Couple of weeks later, the patient suffered from asthenia and an irritable bowel syndrome appeared. An abdominal scanner, echography and radiography was conducted and did not show any abnormalities. She was subsequently hospitalized for a second time for constipation, requiring enemas again.

She gradually presented a difficulty to walk and move her upper limbs, enough to become tetraplegic and to require a wheelchair. Spinal MRI and EMG came back normal. She was placed in a rehabilitation center, but her state did not improve.

Subsequently, she developed a flu syndrome and lost her voice.

When we ran a consultation, she experienced a 15-20kg weight loss over the period of one year. She has a loss of appetite and her daily calorie and fluid intakes are insufficient. She uses a wheelchair and is daily dependent on an adult (to dress, wash, eat or move). She wears diapers and has no sensitivity in her lower limbs.
The organic evaluation done during her hospitalization was negative (brain and spinal MRI, lumbar puncture, video-electroencephalogram, EMG), excluding any somatic pathology. This allowed parents to be more open to the idea of psychological etiology.

In her psychiatric history, she saw a therapist during 6 months in the rehabilitation center.

In her medical history, she was born by caesarian because of breathing difficulty. Her mother did not breastfeed her and she was taken care by a babysitter for her first 9 months. With regards to her development, she has not shown any psychomotor retardation.

In schools, she has good results and maintains good relationships with her classmates. She is in her second year of high school. Her parents describe her as an independent person, a model student, and a person who has a lot of social interaction. In primary school she was taunted by her classmates because she was overweight.

The hospitalization in child and adolescent psychiatry lasted 8 months. During this period, there was, among other things, individual systemic and psychological management.

The patient regains objectives, feels stimulated, and progresses at the motor level.

After a few weeks, she recovered the motor function of her upper limbs. This allowed her to move around on her own in a wheelchair, to be more autonomous, and to no longer need help with everyday gestures. She was also able to participate more actively in the therapeutic workshops. The use of his lower limbs took longer.

As the individual interviews progress, she reports a concern about her mother whom she describes as a depressed person. She described her as little present during her childhood and not very emotional: she never smiled, had a sad face, and had little contact with the patient.

She also realizes that the past conflicts between her parents have affected her greatly (memories of difficult scenes and intense arguments between the parents, who also tended to instrumentalize her in their conflicts).

We conducted a family interview with the patient and her dad, and with the patient and her mom separately, because she had the desire to express her concerns and emotions to everyone.

She also revealed she was in an emotional indifference that allowed her to protect herself from too much internal tension and recognized her difficulty to face the affects and emotions too pervasive.

After several months, she went back home, still in wheelchair but more autonomous.

A second hospitalization was conducted 3 month later, for 8 months. Her mother has started an individual therapy, but we felt a rivalry between the patient and her mother. Her mother was always well dressed, but the patient paid very little attention to her physical appearance. Her father was more appropriate then the last time and was able to talk about verbal abuse he had sometimes against her. The patient was more and more rebel and allowed herself to be angry against them.

Her parents hired a babysitter to take care of the children when they work, whereas before the patient took care of her sister. Since then, the little sister is quieter during interviews.

This second hospitalization allowed the patient to reveal herself, and to feel ready to walk.

She said that during their trip in Egypt, one night she was alone at the hotel room with her sister, and a bellboy knocked at the door. She has experienced this like an intrusive event. He would have looked her insistently and she was uncomfortable, but nothing happened. This event matched with the moment where the symptoms started.

**Discussion**

The evolution of the patient was progressive but positive. Huge collaborative work has to be done.

Her parents described her as a model children and student, with no problems. In addition, she was in a mother’s role with her 6-year-old sister because the parents were not present at home due to their work (restaurant owners).

In the first interviews, the patient did not report any stressors in her life, but later, she recalls painful family memories, and sees things differently than previously. The authors Hurvy and Ouss-Rynagaert talk about the “afterthought” concept of the conversion disorder, introduced by Freud in the post-traumatic therapy [22]. At puberty, there is a process of biological maturation and an afterwards reworking of memories, allowing the teenager to re-elaborate his previous experiences. The patient therefore understands what happened but only after some time [16].

There would be a significant association between maternal psychiatric disorder and adolescent conversion disorder [14]. In this case, the mother is described as someone suffering from depression and this may have led to the onset of the disorder.

Another etiopathogenic hypothesis would be that the many enemas that the patient had have given rise to libidinal excitation, causing the symptom to move throughout the body, as explained above in the psychoanalytic hypotheses.

Studies consolidate the importance of collaborations between clinicians (child psychiatrist and somatician) in diagnosing and organizing management, and the importance of empathy and support. At Erasme hospital there is good collaboration between pediatricians and child psychiatrists, which allows a global management of the patient. Even if the patient is hospitalized in child psychiatry, the somatic aspect should not be minimized.
Conclusion

There is little literature on this disorder in children and adolescents, and the existing studies have many limitations.

The diagnosis of this pathology is difficult to make, as it must be distinguished from the simulation. The doctor must be empathetic and show that he believes the patient. Patient and family acceptance is important for management of this condition, as much as the patient’s rehabilitation.

The treatment is multidisciplinary, and a combination with somatician-psychiatrist consultations is ideal. If that is not possible, there must be close collaboration between the specialists.

This collaboration was possible at Erasme hospital for the patient: child psychiatrist, pediatrician, individual and familial therapists, physiotherapist, occupational therapist and nurses worked together and played a part in the recovery of the patient.

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