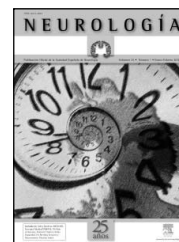




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REVIEW ARTICLE

Psychogenic tremor: a positive diagnosis

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Abstract

Psychogenic movement disorders are a daily challenge for the neurologist. A mistake in its recognition may have important consequences for the patients. As a result, the diagnosis must be considered very carefully in clinical practice. However, psychogenic movement disorders are not unusual, are mainly tremors, and a wrong diagnosis is common. Psychogenic is an unspecific term that usually masks the real mental disorder, and should be called somatoform disorders, factitious disorders, malingering, depression, anxiety and histrionic personality disorder, although the absence of a psychiatric diagnosis does not preclude a psychogenic cause. The diagnosis may often be difficult and should be made by an expert neurologist. Organic movement disorders must be excluded after a detailed neurological history, examination, and appropriate diagnostic studies. Psychogenic tremor is not only a diagnosis of exclusion, it can be diagnosed positively by its neurological signs, mainly: variability in frequency and amplitude, bilateral and sudden onset, non-progressive with frequent remissions, absence of finger, tongue or face tremor and coactivation of antagonistic muscles. Several tests can be useful in diagnosis, such as: accelerometry, EMG and response to placebo or suggestion. The treatment requires close cooperation between the medical team and patient. The problem must never be minimised and early diagnosis and treatment must be attempted.

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PALABRAS CLAVE

Trastornos del
movimiento;
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Depresión

Temblor psicógeno: un diagnóstico en positivo**Resumen**

Los trastornos del movimiento psicógenos constituyen un reto cotidiano para el neurólogo. Un reconocimiento erróneo puede tener importantes consecuencias, por consiguiente este diagnóstico debe considerarse con mucha cautela en la práctica clínica. Sin embargo, los trastornos del movimiento psicógenos no son raros, especialmente el temblor y los errores diagnósticos frecuentes. El término psicógeno es inespecífico y oculta el verdadero trastorno mental que suele ser un trastorno somatomorfo, facticio, simulación, depresión, ansiedad o un trastorno histriónico de la personalidad, aunque la ausencia de un diagnóstico psiquiátrico no descarta la causa psicógena. El diagnóstico es difícil y debe realizarlo un neurólogo experto. Los trastornos del movimiento orgánicos deben excluirse tras una historia detallada, el examen clínico y las pruebas complementarias. El temblor psicógeno no es sólo un diagnóstico de exclusión, se puede diagnosticar en positivo por sus signos clínicos: variabilidad en frecuencia y amplitud, comienzo súbito y bilateral, no progresivo con frecuentes remisiones, nunca afecta a los dedos, lengua o cara y por la coactivación de los músculos antagonistas. Diversas pruebas pueden ser útiles en el diagnóstico, como: acelerometría, electromiograma y respuesta al placebo o la sugestión. El tratamiento requiere una estrecha comunicación entre el equipo médico multidisciplinario y el paciente. Nunca hay que minimizar el problema y siempre intentar un diagnóstico y un tratamiento precoces.

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Introduction

Psychogenic movement disorders are a daily challenge for neuroscientists in both diagnostic and therapeutic approach. The confusion of labelling an organic movement disorder as psychogenic is considered a serious diagnostic error because it deprives the patient of adequate treatment, implies a certain personal stigma for the patient and exposes the physician's skill set; caution should therefore be exercised in the diagnosis. Reciprocally, classifying a movement disorder as organic when in reality it is psychogenic may indicate that the clinician is not familiar with the mechanisms that generate organic movements and does not adequately assess neurological inconsistencies; this may involve an endless series of useless additional tests and subject the patient to treatments that only serve to accentuate the features of the conduct disorder he presents.

However, diagnostic confusion is common in daily practice. It is estimated that 6-30% of organic movement disorders are regarded and treated as psychogenic¹, and this is especially common in the case of dystonia (25-52%)². Alternatively, 25-30% of psychogenic movement disorders are diagnosed as organic. To complicate matters further, it is relatively frequent for an organic movement disorder to coincide with a psychogenic one³, similar to what occurs with epileptic seizures and pseudoseizures.

Movement disorders are one of the most common modes of presentation of psychogenic neurological disorders. A retrospective analysis of clinics specialising in movement disorders, with a certain bias towards underestimation, indicates that 2-3% have a psychogenic origin⁴. They can be manifested as dystonia, parkinsonism, gait and static

disturbance, chorea, myoclonus, tics, hemiballism and tremor⁵. The most frequent are tremor (50%) and dystonia, postural and walking changes and myoclonus^{4,6,7}.

This article reviews the psychopathology underlying psychogenic disorders, aims to increase diagnostic rigor based on positive clinical criteria and complementary tests, and emphasises the importance of early, rational treatment.

Development

Although psychiatric assessment is essential, the diagnosis of a psychogenic movement disorder should and must be carried out by a neurologist and based on clinical observation, since the coexistence of a movement disorder with a mental disorder does not prove that its origin is psychogenic. The key point for its diagnosis is to assess the current inconsistencies and clinical incongruities with the recognised patterns of abnormal movements; hence, once a detailed history, a thorough examination and appropriate complementary techniques have reasonably excluded an organic basis, certain diagnostic keys indicative of a psychogenic origin have to be considered^{5,8} (Table 1): acute onset and rapid progression towards its maximum severity, static course with spontaneous remissions and paroxysmal exacerbations, variability in amplitude, frequency and distribution, selective disability for certain tasks, lack of response to standard treatments, surprising and dramatic response to psychotherapy and placebo, variability in amplitude and worsening with attention and the existence of a clearly diagnosed psychopathology.

Table 1 Key signs indicative of a psychogenic movement disorder

Acute onset
Rapid progression
Static course
Spontaneous remissions and paroxysmal exacerbations
Variability in amplitude, frequency and distribution
Selective disability for tasks
Lack of response to standard therapy
Improvement with psychotherapy and placebo
Dependency of attention
Psychopathology

Multiple somatizations or complaints without an accurate diagnosis, false sensory complaints and paresis, deliberate slowness of movement, constantly awaiting judgement, rewards or secondary gain, absence of family history and being employed in a health profession are also considered as indicative of a psychogenic origin, although of minor importance.

Some clinical findings are considered almost incompatible with a psychogenic origin, including tremor when counting coins, very brief myoclonus and high-frequency tremor (> 12 Hz). However, in rare cases there may be a psychogenic origin to the antagonist gesture that characterizes dystonia, dyskinesias in non-parkinsonian patients after intravenous administration of apomorphine and even palatal tremor. Therefore, the diagnosis should not be dismissed simply because the movement is difficult to imitate or there are classic features of organicity. Alternatively, it should not be established in cases of unknown or strangely mixed clinical presentation⁹. Fahn et al.¹⁰ have proposed four levels of certainty for the diagnosis of a psychogenic dystonia that can be applied to the rest of movement disorders (Table 2).

However, the term “psychogenic”, derived from a Greek word meaning “created by the soul”, is very non-specific. Its extensive, excessive use is common and leads to the fact that the psychiatric syndrome is often hidden. It is very important to establish the underlying psychopathology to diagnose the patient as rigorously as possible and propose the most appropriate therapeutic method.

Psychopathology of psychogenic movement disorders

Following the excellent review of Arias¹¹, psychogenic neurological disorders can be classified into dissociative and with somatization:

Dissociative disorders. Unbearable problems, traumatic events and altered interpersonal relationships result in the loss of integrity between memory, personal identity, immediate experiences and movement control invoked as mechanisms in the genesis of mental and physical symptoms. Psychological conflicts result in an impairment of mental functions such as memory, consciousness and self identity. Therefore, dissociative disorders cannot be the basis of a

Table 2 Degrees of certainty for the psychogenic origin of movement disorder

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1. Documented. Psychotherapy, suggestion or placebo improve symptoms greatly in a maintained manner, or the patient is asymptomatic when not observed
 2. Clinically established. The movements are inconsistent or incongruous and in the presence of other psychogenic signs, somatization and psychopathology
 3. Probable. Only inconsistent or incongruous movements
 4. Possible. In the presence of an emotional disorder
-

psychogenic movement disorder. They can be manifested as amnesia, fugues, stupor or as identity, trance and possession disorders.

Somatization disorders. Physical symptoms express the existence of emotional conflicts and are characterised in all cases by the existence of a more or less hidden purpose of psychological or material gain. The degree of awareness or intentionality serves to classify them:

1. Somatomorphic (unconscious): unconscious disorders, their origin is a psychological conflict that takes the form of a physical illness. They are more common in poorly educated people with alexithymia (inability to use verbal resources), stigmatisation of mental illness, primitive and uncritical religious beliefs, history of head trauma or abuse.
- Somatization: it presents a history of multiple physical symptoms before age 30 that motivate repeated medical consultations and changes in all facets of their life. The Diagnostic and Statistical Manual of Mental Disorders (4th ed.) (DSM-IV) indicates that diagnostic criteria for multiple somatization disorder are having submitted 4 pain symptoms, 2 gastrointestinal, 1 sexual and 1 neurological symptom. A variation is undifferentiated somatization, which is manifested by symptoms referred to a single organ or system: cardiac neurosis, neurocirculatory asthenia, psychogenic dyspepsia, chronic irritable bowel, etc. It is common for patients to consume numerous drugs and to experience many different invasive explorations or unnecessary surgeries.
 - Conversion or hysteria: it is characterised by one or more sensory or motor symptoms whose appearance is preceded by conflicts. These are not intentional or feigned, although they can be maintained for the secondary gain involved. They can not be blamed on a medical condition, cause great personal distress and are not limited to the sexual or painful sphere. Although traditionally interpreted as the symbolic expression of an emotional conflict, there is evidence of dysfunction of different brain circuits that would also involve an altered state of consciousness and volitional control. It appears that the activation of

certain areas, in particular limbic areas, could cause an increase in sensory and motor area inhibition. Several signs indicative of a functional condition have been described: Hoover's sign, the abductor sign, sudden whole-body weakness (collapse) from a minimal stimulus, simultaneous contraction of agonists and antagonists, the inability to touch the face with a paretic member, unilateral weakness of the sternocleidomastoid, Pastor's sign¹² and hemihypesthesia in exactly half the body.

- Hypochondriasis: it is the long-lasting conviction (more than 6 months) of suffering an illness against the general opinion of doctors.
 - Persistent pain: it includes atypical facial pain, chronic back pain, tension headache, chronic pelvic pain and post-traumatic stress disorder.
 - Body dysmorphism.
2. Factitious: they are aware and the role of sickness is assumed.
- Munchausen syndrome.
 - Munchausen syndrome by proxy.
 - Ganser syndrome: patients intend to be taken for fools or madmen.
3. Simulation: they are self-aware and with intention of secondary gain.

Other psychiatric disorders can cause psychogenic movement disorders. Depression is among the leading causes in various series⁵ and antidepressant treatment often resolves the clinical manifestations of these patients. Anxiety has also been described as a frequent cause of psychogenic movement disorders. Finally, in some cases of suspicion it is not possible to establish a precise and definitive psychiatric diagnosis, a fact that does not completely exclude a psychogenic origin.

As mentioned previously, psychopathology in a patient with movement disorder is a common bias factor that leads to mischaracterising an organic movement disorder as psychogenic. It is therefore essential to know the clinical characteristics of organic movement disorders; in our case, of tremor.

Clinical features of organic tremor

There are certain general principles that, with some exceptions, help to differentiate organic from psychogenic tremor⁵ (Table 3): organic tremor usually starts gradually, but sometimes appears suddenly as is the case in those secondary to vascular disease or trauma. The onset is typically unilateral, later spreading to become bilateral as it increases in severity; however, this is not so in cases induced by drugs or toxic agents and in physiological tremor. It is usually specific to resting, posture or action; it is rare for it to appear in all three situations, although this may well happen in the case of Holmes tremor. Although it may be specific to a task (often writing), if the tremor appears in isolation, a psychogenic origin should be suspected. The organic tremor tends to increase with anxiety and

Table 3 General clinical features of organic tremor

Progressive onset
Unilateral start
Selective of rest, postural or action
Not usually task-dependant
Increases with anxiety, but also with distraction
Stable frequency
Does not subside spontaneously

distraction, so manoeuvres that involve a significant need for mental concentration are often used to highlight it, such as walking backwards or counting in reverse order. The frequency is usually stable and does not change. It almost never subsides spontaneously, although placebos may lead to a modest reduction in severity.

The diagnosis of a tremor as psychogenic is usually based on negative criteria, that is, in the absence of symptoms indicative of an underlying organic cause. However, in a manner similar to organic tremor, there are a number of features that can point towards the existence of a tremor of psychogenic origin and establish positive diagnostic criteria.

Clinical features of psychogenic tremor

Psychogenic tremor may come to represent about 10% of the total of tremors seen⁴. It usually affects women preferentially in a ratio of 2-4:1, and it can occur at any age of life from adolescence to senescence, although it can also be seen in paediatric age^{13,14}. Its onset is usually sudden and diagnosis is usually delayed 2-3 years from the onset of symptoms. It is common for patients to present other previous diseases, especially more or less unspecific psychiatric or painful disorders, although it may also occur in previously healthy subjects. In most cases the tremor is appendicular; however, in some cases it is axial and appears in static standing and/or walking. To accept the diagnosis of a tremor as psychogenic, it is necessary to exclude known causes of symptomatic tremor, such as hyperthyroidism, exposure to the iatrogenic effect of certain drugs, certain hormonal or metabolic dysfunctions, essential and parkinsonian tremor; that there is no evidence of any other neurological dysfunction also needs to be established. Patients must have been symptom-free for longer than 2 weeks¹⁵.

Psychogenic tremor is not only an exclusion diagnosis; to the contrary, it is characterised by clinical features typical enough to allow a positive diagnosis to be established¹⁵⁻¹⁷ (Table 4). These features include variability in direction, frequency and amplitude; sudden and bilateral onset usually associated with stressful life events; static and progressive course; never affecting the fingers, tongue or face; fluctuating severity with frequent remissions; association with a very selective functional disability, but not of general tasks (inability to sign, but not to draw); and coactivation of agonist and antagonist muscles (required for the genesis of the tremor). Others are the disappearance of the tremor

Table 4 Clinical features of psychogenic tremor

Variability in direction, frequency and amplitude
Abrupt and bilateral onset, associated with stress
Static course, not progressive
Never affects the fingers, tongue or face
Fluctuating severity and frequent remissions
Highly selective functional disability, but not task-selective
Presence of coactivation
Prior history of other somatic symptom
Responds to placebo, but not to the usual anti-tremor treatment
Onset of unrelated neurological signs

once the hypertonicity disappears; usually, prior history of other somatizations; ineffectiveness of common anti-tremor pharmacological treatment, but response to placebo (30% of organic tremors also reduce their amplitude) and psychotherapy; and, finally, the appearance of unrelated neurological signs.

If the tremor is widespread, the only relevant differential diagnoses include orthostatic tremor, some forms of essential tremor during standing and rare forms of Parkinson's disease. Widespread psychogenic tremor is mixed, with a variable oscillation frequency, exhausting and with a spontaneous conclusion, and psychogenic features are usually more evident.

If the tremor is located exclusively in the limbs, it is more difficult to differentiate from other organic tremors. This requires taking into account the following features of psychogenic tremor: signs of both clinical and electromyographic coactivation; the absence of finger tremor; tremor amplitude increase produced by accelerometry with weight loads (in contrast to what happens in organic tremors); maintenance of the same or decreased frequency; sudden onset, usually associated with a stressful situation; association with posture and/or action (never a strictly resting tremor); spontaneous remissions for several days are frequent; reduction in tremor amplitude or even tremor disappearance produced by diversion manoeuvres with arithmetic calculation or alternating movements with the contralateral hand; and a change in frequency, adapting to the voluntary movement.

Complementary tests

1. Suggestion and use of placebos. These are the mechanisms most used by clinicians to "prove" the psychogenic origin of any movement disorder. However, it must be kept in mind that 30% of organic tremors decrease their amplitude with placebo. The use of a placebo may be ethically questionable because it can be considered as a distortion of the trust required in the physician-patient relationship. Assessing the response to placebo and psychotherapy and allowing continuous observation may require hospital admission,

which probably offers the patients therapeutic credibility regarding the proper care provided by the doctor to their complaints.

2. Accelerometry with weight loads. An increase in the amplitude of the oscillation with the use of loads (500 g-1 kg), to maintain the generating mechanism of antagonistic muscle coactivation, is characteristic of psychogenic tremor. This does not occur in other tremors of an organic nature (Parkinson's disease and essential tremor). Tremor frequency is not altered¹⁵ or markedly decreases¹⁸ in psychogenic tremor, which does not occur in organic tremors, as could be foreseen¹⁵.
3. Electromyogram (EMG). The EMG may be helpful for the differential diagnosis of psychogenic tremor. It is usually not necessary to use needle electrodes, surface electrodes generally being sufficient¹⁶. As has been mentioned previously, it is possible to record coactivation of agonist and antagonist muscles through the EMG approximately 300 ms before the onset of psychogenic tremor, as if the coactivation was the inducer triggering the tremor. This does not happen in parkinsonian tremor¹⁵. Variability can be shown in both tremor frequency and amplitude. This variability in frequency can be found in organic tremors; however, variability greater than 2 Hz does appear only in the psychogenic tremor¹⁸.

Four neurophysiological characteristics of psychogenic tremor have been described: frequency variation is typical and results in a broad, ill-defined spectral peak, the oscillation disappears with motor or mental distraction manoeuvres, activity in the EMG alters and the dominant frequency decreases with the load test¹⁹.

The frequency coherence test, which shows the trapping of frequencies, can be carried out with the EMG. This test is based on the inability to generate different frequencies of oscillation in both hands, one characteristic of the psychogenic tremor and the other voluntary and shown on the test. This same phenomenon occurs in healthy subjects. In the case of organic tremors, it is possible to develop different frequencies, one from the rhythm that generates the tremor itself and the other voluntary²⁰. However, one study indicates that there may be cases of psychogenic tremor that can develop two simultaneous tremor frequencies²¹, which would detract from the capacity of the test to discriminate. If the tremor frequency is greater than 11 Hz, the tremor is unlikely to be psychogenic²², since it is very difficult to generate a voluntary tremor at a frequency greater than 7 Hz²³.

Similarly, EMG records have demonstrated that ballistic movements of the contralateral hand stop or reduce the amplitude of psychogenic tremor, which serves to differentiate it from essential and parkinsonian tremor, in which this does not occur²⁴. Furthermore, what the clinical picture already indicated has been quantified in the laboratory: that the psychogenic tremor and that of healthy volunteers reduces reaction time, which does not happen in essential and parkinsonian tremor. This indicates that a sustained attentional component is required for the generation of psychogenic tremor, but is not necessary in

organic tremor, which limits the execution of tasks and acts as a "bottleneck" in central processing²⁵.

The neurophysiological tests described are not commonly used in clinical practice. In any case, the results should always be contextualised in the clinical environment.

Treatment

Psychogenic tremor is not a trivial disease, given that more than half the cases end up developing a moderate or severe social-working disability²⁶. The majority of successful treatments and complete remissions occur preferentially in young patients with a short time of evolution. If the diagnosis is not made early and treatment is delayed, the clinical course is usually torpid, fluctuating, progressive and restrictive. The condition often implies a certain social isolation and abandonment from work, without this assuring tremor disappearance or improvement¹⁵. Iatrogenic damage and the perpetuation of disease awareness should be avoided through a correct and, if possible, early diagnosis.

The following are good prognostic factors: acute onset, appearance in young subjects, early diagnosis, previous health, the absence of an organic psychopathology and an identifiable triggering factor, especially if this is a traumatism. Identifying stressors or precipitating factors and those perpetuating the disorder is essential to guide the therapeutic strategy.

Physical therapy and psychotherapy with positive reinforcement can improve or even eliminate the symptoms in many cases. The use of placebo, as previously mentioned, may have a role in both diagnosis and treatment. Its therapeutic use must be established with the patient being admitted to the hospital and the results obtained must be explained in a reasonable and understandable manner. The methods of biofeedback through electromyography may be useful in some cases.

There is little data on the treatment of psychogenic tremor and, in general, all psychogenic movement disorders. There are, to our knowledge, no controlled trials available and the literature on the treatment is very scarce. Drugs, both anxiolytics and antidepressants, tend to be used in cases where emotional disturbances play a key role in the genesis of the movement disorder, but there is no evidence regarding the type of preferred agents.

Sound judgement indicates that the therapeutic approach should be multidisciplinary and should involve the collaboration of the patient, the neurologist, psychiatrist, psychologist, primary care physician and the patient's family. In many cases, there is some resistance from the patients themselves or their families to consider the need for psychiatric treatment. In these cases, it is important for the doctor to use the term "neurobiology of the disorder" or "disorder of the mind-body relationship". It is also recommended that the evaluation and treatment should be carried out from different perspectives or specialties simultaneously. We must avoid, as ineffective and counterproductive, the confrontation of the problem with suggestions like "this is nothing; I can't find any illness" because the patient will probably interpret this as "the doctor didn't take me seriously" or even worse, "the doctor thinks I'm crazy".

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