

Primary Orthostatic Tremor

NORD gratefully acknowledges Joseph Jankovic, M.D, Professor of Neurology, Director, Parkinson's Disease Center and Movement Disorders Clinic, Baylor College of Medicine, Department of Neurology, for assistance in the preparation of this report.

Synonyms of Primary Orthostatic Tremor

- idiopathic orthostatic tremor

General Discussion

Summary

Primary orthostatic tremor is a rare movement disorder characterized by a rapid tremor in the legs that occurs when standing. The tremor disappears partially or completely when an affected person is walking or sitting. Individuals with primary orthostatic tremor experience feelings of unsteadiness or imbalance. The tremor is sometimes described as causing "shaky legs" and can cause affected individuals to immediately attempt to sit or walk because of a fear of falling. In many cases, the tremors become more severe over time. Primary orthostatic tremor is a constant problem that can affect the quality of life of affected individuals. The exact cause of primary orthostatic tremor is unknown.

Introduction

Primary orthostatic tremor was first described in 1984 by Heilman. There is controversy within the medical literature regarding whether primary orthostatic tremor is a variant of essential tremor, an exaggerated physiological response to standing still or a distinct clinical entity.

Signs & Symptoms

The main symptom of primary orthostatic tremor is the occurrence of a rapid tremor affecting both legs while standing. A tremor is involuntary, rhythmic contractions of various muscles. Orthostatic tremor causes feelings of unsteadiness or imbalance in the legs. The tremor associated with primary orthostatic tremor has such high frequency that it may not be visible to the naked eye but can be palpated by touching the thighs or calves or can be detected by listening to these muscles with a stethoscope. The tremor is position-specific (standing) and disappears partially or completely when an affected individual walks, sits or lies down. In many cases, the tremor becomes progressively more severe and feelings of unsteadiness become more intense. Some affected individuals can stand for several minutes before the tremor begins; others can only stand momentarily. Eventually, affected individuals may experience stiffness, weakness and, in rare cases, pain in the legs. Orthostatic tremor, despite usually becoming progressively more pronounced, does not develop into other conditions or affect other systems of the body.

In some cases, affected individuals may also have a tremor affecting the arms. In one case reported in the medical literature, overgrowth of the affected muscles (muscular hypertrophy) occurred in association with primary orthostatic tremor.

Causes

The exact cause of primary orthostatic tremor is unknown (idiopathic). Some researchers believe that the disorder is a

variant or subtype of essential tremor. Other researchers believe the disorder is a separate entity. Some individuals with primary orthostatic tremor have had a family history of tremor suggesting that in these cases genetic factors may play a role in the development of the disorder. However, more research is necessary to determine the exact, underlying cause(s) of primary orthostatic tremor.

Affected Populations

Primary orthostatic tremor affects males and females in equal numbers. Because many cases of primary orthostatic tremor often go unrecognized or misdiagnosed, the disorder is believed by some to be under-diagnosed, making it difficult to determine the true frequency of this disorder in the general population.

Related Disorders

Tremors, involuntary quivering, or trembling movements can occur in association with many disorders. They may occur at any age and may be rhythmic or intermittent. Tremors mainly occur in disorders of the central nervous system, and especially in disorders of the cerebellum or basal ganglia. Examples of cerebellar diseases might be tumors of the cerebellum, multiple sclerosis involving the cerebellum, or a degenerative disease such as spinocerebellar degeneration. Examples of disorders of the basal ganglia include Parkinson's disease (discussed in more detail below), Wilson's disease, and many other rare and common disorders. Tremor may also occur as a result of anxiety, medication, or be of unknown cause (idiopathic).

Orthostatic myoclonus is a rare condition that is similar to primary orthostatic tremor, but myoclonus refers to sudden, involuntary jerking of a muscle or group of muscles caused by muscle contraction or relaxation. Orthostatic myoclonus is characterized by slowly progressive unsteadiness when standing that is relieved by walking or sitting. Some affected individuals experienced bouncing stance and recurrent falls. More research is necessary to determine when orthostatic myoclonus and primary orthostatic tremor are the same disorder or similar, yet distinct, disorders.

Essential tremor is a common movement disorder characterized by an involuntary rhythmic tremor of a body part or parts, primarily the hands, arms, and neck.. In many affected individuals, upper limb tremor may occur as an isolated finding. However, in others, tremor may gradually involve other anatomic regions, such as the head, voice, and tongue, leading to a quiver in the voice or difficulties articulating speech. Less commonly, tremor may affect muscles of the trunk or legs. Patients with essential tremor involving the legs are often misdiagnosed as having orthostatic tremor, but in the latter condition the tremor is much more frequent (14-6Hz) than in essential tremor (4-12Hz). In individuals with the condition, tremor tends to occur while voluntarily maintaining a fixed posture against gravity ("postural tremor") or while performing certain goal-directed movements ("kinetic intention tremor"). Although tremor is typically absent with rest—i.e., when the affected muscle is not voluntarily activated—some individuals with advanced disease may develop resting tremors and some may even evolve into Parkinson's disease. Essential tremor may appear to occur randomly for unknown reasons (sporadically) or be transmitted as an autosomal dominant trait. Researchers suggest that changes (mutations) of different genes may be responsible for the disorder (genetic heterogeneity). (For more information on this disorder, choose "essential tremor" as your search term in the Rare Disease Database.)

Parkinson's disease is a common slowly progressive neurologic condition characterized by involuntary trembling (tremor), muscular stiffness or inflexibility (rigidity), slowness of movement and difficulty carrying out voluntary movements. Degenerative changes occur in areas deep within the brain (substantia nigra and other pigmented regions of the brain), causing a decrease in dopamine levels in the brain. Dopamine is a neurotransmitter, which is a chemical that sends a signal in the brain. Parkinsonian symptoms can also develop secondary to degenerative diseases such as multiple system atrophy, hydrocephalus (a condition in which areas of the brain accumulate excessive fluids, resulting in an increase in pressure on the brain), head trauma, inflammation of the brain (encephalitis), circulatory disturbances (infarcts) or tumors deep within the cerebral hemispheres involving the area

just above the brain stem (basal ganglia), or exposure to certain drugs and toxins. Parkinson's disease is slowly progressive and may not become incapacitating for many years. (For information on this disorder, choose "Parkinson" as your search term in the Rare Disease Database.)

Diagnosis

A diagnosis of primary orthostatic tremor is based upon a thorough clinical evaluation, a detailed patient history, and supported by specialized tests such as a surface electromyogram (EMG). Misdiagnosis is common. Many individuals may be initially suspected of having a psychogenic disorder (a disorder caused by a psychological cause rather than a physical one).

Clinical Testing and Work-Up

A surface EMG measures the electrical impulses of muscles at rest and during contraction. A surface electromyogram can often rapidly establish a diagnosis of primary orthostatic tremor by reproducing the characteristic tremor in the legs. With a surface electromyogram electrodes are placed on the skin overlying the muscles that are to be tested.

Standard Therapies

Treatment

Various medications may help relieve symptoms associated with primary orthostatic tremor. In most cases, affected individuals are treated with a drug called clonazepam (Klonopin). However, some affected individuals do not respond to this first-line drug treatment.

Some affected individuals responded favorably after being treated with an anti-seizure (anticonvulsant) drug called gabapentin (Neurontin). A very small double-blind, placebo controlled study demonstrated that affected individuals experienced a sustained improvement when treated with the drug. Authors of the study suggested that gabapentin be considered a first-line therapy for individuals with primary orthostatic tremor.

Additional drug therapies that have been used to treat individuals with primary orthostatic tremor include primidone (Mysoline), chlorthalidone (Thalidon), pregabalin (Lyrica), pramipexole (Mirapex), phenobarbital and valproic acid (Depakote). Drugs commonly used to treat people with Parkinson's disease (levodopa or pramipexole) may also be prescribed for individuals with primary orthostatic tremor. Additional treatment is symptomatic and supportive.

Investigational Therapies

The medical literature details several cases of individuals with primary orthostatic tremor who have been treated by thalamic deep brain stimulation. Thalamic refers to the thalamus, a portion of the brain that relays sensory information. It is believed that some types of tremors occur due to abnormal brain activity that is processed in the thalamus. During this procedure, an electrode is placed into the thalamus and a thin wire is passed under the skin is connected to a small battery pack (which is also placed underneath the skin). The electrode is used to send electrical impulses (stimulate) to the brain and interrupt aberrant nerve signals that contribute to tremors. In some cases reported in the medical literature, tremors of individuals with primary orthostatic tremor were successfully controlled with thalamic deep brain stimulation. However, more research is necessary to determine the long-term safety and effectiveness of this potential therapy for primary orthostatic tremor.

Information on current clinical trials is posted on the Internet at www.clinicaltrials.gov. All studies receiving U.S. government funding, and some supported by private industry, are posted on this government web site.

For information about clinical trials being conducted at the NIH Clinical Center in Bethesda, MD, contact the NIH

Patient Recruitment Office:

Toll-free: (800) 411-1222

TTY: (866) 411-1010

Email: prpl@cc.nih.gov

For information about clinical trials sponsored by private sources, contact:

www.centerwatch.com

For information about clinical trials conducted in Europe, contact:

<https://www.clinicaltrialsregister.eu/>

Resources

Please note that some of these organizations may provide information concerning certain conditions potentially associated with this disorder.

Supporting Organizations

- [Genetic and Rare Diseases \(GARD\) Information Center](#)
 - PO Box 8126
 - Gaithersburg, MD 20898-8126
 - Phone: (301) 251-4925
 - Toll-free: (888) 205-2311
 - Website: <http://rarediseases.info.nih.gov/GARD/>
- [Movement Disorder Society](#)
 - 555 E. Wells Street
 - Suite 1100
 - Milwaukee, WI 53202-3823
 - Phone: (414) 276-2145
 - Email: info@movementdisorders.org
 - Website: <http://www.movementdisorders.org>
- [NIH/National Institute of Neurological Disorders and Stroke](#)
 - P.O. Box 5801
 - Bethesda, MD 20824
 - Phone: (301) 496-5751
 - Toll-free: (800) 352-9424
 - Website: <http://www.ninds.nih.gov/>

- [OT Resource](#)
 - Email: gloria@orthostatictremor.org
 - Website: <http://www.orthostatictremor.org>

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