Editorial

Body Tremors – A Public Health Issue

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Introduction

Tremor is one of the most common movement disorders and can interfere with a person's ability to work or perform basic activities of daily living[1,2.] Tremor is a movement about a joint that is involuntary, rhythmic and oscillatory[3]. Tremor is a neurological condition that includes shaking or trembling movements in one or more parts of the body, most commonly affecting a person's hands. It can also occur in the arms, legs, head, vocal cords, and torso. The tremor may be constant, or only happen sometimes. Tremor can occur on its own or as a result of another disorder.

Symptoms of Tremor

Tremor can make daily life tasks such as writing, typing, eating, shaving, and dressing more difficult.

Common symptoms may include Rhythmic shaking of the hands, arms, head, legs, or torso, Shaky voice, Difficulty with writing or drawing, small handwriting, loss of smell, trouble sleeping, trouble moving or walking, constipation, soft or low voice, masked face, dizziness and fainting. Some tremor can be triggered by stress or strong emotion.

Causes of Tremor

Tremor is most common among middle-aged and older adults, although it can occur at any age. Generally, tremor occurs in men and women equally.

Tremor is usually caused by a problem in the parts of the brain that control movements. Most types have no known genetic cause, although there are some forms that appear to be inherited and run in families.

Tremor can occur on its own or be a symptom of other neurological disorders such as Parkinson's disease, multiple sclerosis and stroke. Tremor sometimes can be caused by other medical conditions, including but not limited to:

- **Medicines.** Several drugs can cause tremors, including certain asthma medications, corticosteroids, chemotherapy, and drugs used for certain psychiatric and neurological disorders.
- **Heavy metals and other neurotoxins**. Exposure to heavy metals (such as mercury, manganese, lead, arsenic, etc.), organic solvents, or pesticides may cause tremors.
- **Caffeine.** Excessive caffeine may cause temporary tremor or make an existing tremor worse.
- **Thyroid disorder.** An overactive thyroid can cause tremors.
- **Liver or kidney failure.** Liver and kidney failure may cause damage in certain brain areas that leads to tremors or jerky movements.
- **Diabetes**. High or low blood sugar (hyperglycemia or hypoglycemia, respectively) may cause tremors or other involuntary movements.
- **Stress, anxiety, or fatigue** may be associated with tremors.

Types of tremor

Tremor is categorized based on when and how the tremor is activated. These categories are rest and action tremor.

Rest tremor occurs when people are at rest. People with Parkinson's disease often experience rest tremor.

Action tremor occurs when a muscle is moved voluntarily. There are several sub-classifications of action tremor, many of which overlap.

- **Postural tremor** occurs when holding a position against gravity, such as holding the arms outstretched.
- **Kinetic tremor** is associated with any voluntary movement, such as moving the wrists up and down or closing and opening your eyes.
- **Intention tremor** starts when the person makes an intended movement toward a target, such as lifting a finger to touch their nose.
- **Task-specific** tremor only appears when performing goal-oriented tasks such as handwriting or speaking.
- **Isometric tremor** occurs during a voluntary muscle contraction that is not accompanied by any movement, such as when holding a heavy book in the same position.

Tremor syndromes are defined based on the pattern of the tremor. Some of the most common forms include:

Essential tremor

Essential tremor is one of the most common movement disorders. Its key feature is a tremor in both hands and arms during action without other neurological signs. It also may affect a person's head, voice, or lower limbs. Although the tremor can start at any age. The exact cause of essential tremor is unknown.

Dystonic tremor

Dystonic tremor occurs in people who are affected by dystonia—a movement disorder in which incorrect messages from the brain cause muscles to be overactive, resulting in abnormal postures or sustained, unwanted movements.

Cerebellar tremor

Cerebellar tremor is typically a slow, big (high amplitude) tremor of the arms, legs, hands, or feet that worsens at the end of a purposeful movement such as pressing a button. It is caused by damage to the cerebellum and its pathways to other brain areas, often from a stroke or tumor, injury from a disease or an

inherited disorder, or from chronic damage due to alcohol use disorder.

Functional tremor

Functional tremor (also called psychogenic tremor) can appear as any form of tremor. Its symptoms may vary but often start suddenly and fluctuate widely.

Enhanced physiologic tremor

Enhanced physiologic tremor typically involves a fine amplitude (small) action tremor in both the hands and the fingers. It is generally not caused by a neurological disease but by reaction to certain drugs, alcohol withdrawal, or medical conditions including an overactive thyroid and hypoglycemia. It is potentially reversible once the cause is corrected.

Parkinsonian tremor

Parkinsonian tremor is common and one of the first signs of Parkinson's disease, although not all people with Parkinson's disease have tremor. Its shaking is most noticeable when the hands are at rest and may look as if someone's trying to roll a pill between the thumb and a finger. Parkinson's tremor may also affect the chin, lips, face, and legs. The tremor may initially appear in only one limb or on just one side of the body but may spread to both sides as the disease progresses. The tremor is often made worse by stress or strong emotions.

Orthostatic tremor

Orthostatic tremor is a rare disorder characterized by rapid muscle contractions in the legs that occur when a person stands up. The tremor usually stops when the person sits down or walks.

Epidemiology

In 2021 online survey of people with essential tremor found that nearly one-third of respondents were not seeing a physician[4]. These low rates of engagement with health systems are due to the mild nature of many ET cases, but other factors like access to care or health literacy may also play a role[5]. Epidemiological studies have established that ET is a common condition, especially among people aged 65 years and older, and that many ET cases in the general population are undiagnosed.

Genetics

A positive family history has been reported in 30–70% of patients with ET[6]. There is increased risk (4.7 fold) of developing ET for people with a first-degree relative with ET[7].

Pathophysiology

The cerebello-thalamo-cortical circuit is the main network involved in ET. This has been supported by postmortem, functional, and structural neuroimaging and electrophysiological studies[8].

Diagnostic criteria

Essential tremor is clinically diagnosed by a review of medical history, family history, and a physical examination. The examination evaluates for the presence of postural or kinetic tremor of the arms, legs, head, and voice. Criteria that help make this diagnosis include a family history of tremor, response to alcohol, and a long history of tremor, in addition to the absence of other neurological signs such as dystonia, ataxia, or parkinsonism[9].

Treatment of Tremors

There is no cure for most forms of tremor, treatments are available to help manage symptoms. In some cases, symptoms may be mild enough that they do not need treatment. Treating any underlying health condition can sometimes cure or reduce a person's tremor.

Medications

Some medications can slow tremor. Some medications commonly used to treat tremor include Beta-blocking drugs can treat essential tremor and other types, Tranquilizers (also known as benzodiazepines), Dopaminergic medications, Anticholinergic medications and Botulinum toxin (commonly known as Botox) injections can be useful for dystonic head tremor and hand tremor.

Surgery

Surgical procedures may be performed when tremor does not respond to medications or severely impacts daily life.

Deep brain stimulation (DBS) is the most common form of surgical treatment of tremor. It uses surgically implanted electrodes to send high-frequency electrical signals to the thalamus, the deep structure of the brain that coordinates and controls some involuntary movements. A small pulse-generating device placed under the skin in the person's upper chest (similar to a pacemaker) sends electrical stimuli to the brain to temporarily stop tremor. DBS is currently used to treat parkinsonian tremor, essential tremor, and dystonia.

Lifestyle changes for treating tremor

Certain lifestyle changes and techniques may provide some relief for mild to moderate tremor.

- Physical, speech, and occupational therapy may help control tremor and adapt to daily challenges caused by the tremor.
- Eliminating or reducing caffeine.
- Assistive tools, such as special plates, spoons, or heavier utensils can lessen tremor and make it easier to eat.
- Take medications on time. Talk with a doctor about stopping any medications that may be contributing to the tremor.
- Reduce stress or stressful situations that can aggravate the tremor.
- Wear clothes that make it easier to dress, such as those that use Velcro instead of buttons. Consider slip-on or no-tie shoes.
- Get enough sleep. Some tremors worsen when a person is tired. Physical activity and exercise can help prevent fatigue and improve sleep.

Vibration therapy

A recently published study evaluated the efficacy of a handheld vibratory device for the treatment of ET

called the Vilim Ball. The device vibrates between 8 and 18 Hz and 0–2 mm in amplitude. Seventeen participants with ET were treated with the device for 5 min minutes and tremor power was measured by accelerometer before and after treatment[10].

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