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"Unveiling the Mystery of Movement Disorder: A Case of Autoimmune Encephalitis with Depressive Features – Diagnosis, Management, and Nursing Care"

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Abstract:
Movement disorders are neurological conditions characterized by abnormal movements, which may include delayed or reduced motion, excessive movement, or involuntary motions such as jerking, shaking, or spasms. These disorders can interfere with an individual's ability to make voluntary movements and may affect specific body parts or overall mobility. Common movement disorders include restless legs syndrome, essential tremor, and Parkinson's disease. Although some of these disorders may result in a single symptom, such as tremors, others like Parkinson's disease present with a range of symptoms. This case study discusses a patient, Mrs. Akila, presenting with unsteady gait, difficulty opening her eyes, disorientation, poor food intake, and reliance on support for standing, in the context of a recent fever and family stress. Despite normal test results from thyroid, blood, urine, and nutritional assessments, MRI imaging revealed patchy lesions in the bilateral medial temporal lobes. The final diagnosis was movement disorder with depressive disorder and autoimmune encephalitis. This case highlights the complexity of diagnosing movement disorders and underscores the need for comprehensive investigation when symptoms do not align with common conditions.

Keywords:
Movement disorders, restless legs syndrome, essential tremor, Parkinson's disease, involuntary movements, autoimmune encephalitis, MRI brain, depressive disorder, unsteady gait, neurological disorders.

Introduction:

Increased and/or slow movement is a symptom of movement disorders. It affects the individual to make decisions to move or result in uncontrollable motions. A number of movement disorders exist. Among the most prevalent are restless legs syndrome, essential tremor, and Parkinson's disease. A type of neurological illnesses known as movement disorders results in aberrant movements. They could be delayed or reduced movement, or excessive movement (such as jerking, shaking, or spasms). They may produce uncontrollable (involuntary) motions or

influence voluntary behaviors.[1] Movement disorders come in a variety of forms and range in severity. While some can impact the majority of the body, others just impact a single part. While some may cause problems with movement and mobility, others may impede certain skills, such as writing. In certain cases, such as essential tremor, abnormal movements may be the only symptom. Or, as in Parkinson's disease (PD), they may represent one of a number of symptoms or syndromes.[2] Furthermore, some movement abnormalities can be a symptom of other ailments, such as myoclonus, or they might be a condition in and of themselves. Although they impair mobility, diseases that cause paralysis or muscular dystrophy—conditions that cause a lack of movement or weakening of the muscles—are not classified as movement disorders. Unwanted, aberrant motions are a symptom of movement disorders.[3]

Case presentation

A case study of movement disorder is discussed with the consent of her husband. Mrs. Akila had complaints of unsteady gait, not opening the eyes fully, disoriented towards, poor food intake, and difficulty in standing without support for the past 15 days. She had history of fever for one week. Also she had stress factor due to family issues. Investigations like thyroid test, latex agglutination test, blood test, urine test, mini nutritional assessment and ultra-sonography revealed no abnormalities. MRI Brain contrast showed patchy areas in bilateral medial temporal lobes and patient was diagnosed for movement disorder with depressive disorder and auto immune encephalitis.

Physical Examination of Mrs. Akila:

In this case, the patient presents with several neurological and psychiatric symptoms, so the physical examination would focus on assessing her motor, cognitive, and emotional status. Here is a breakdown of the key components of the physical examination for Mrs. Akila

General Appearance:

- **Observation:** Mrs. Akila may appear fatigued o due to poor food intake and disorientation. She might have difficulty maintaining eye contact or exhibit signs of confusion.
- **Posture and Gait:** Likely to be unsteady, possibly needing support to stand or walk. The unsteady gait could be a result of the movement disorder associated with autoimmune encephalitis.

Vital Signs:

- **Temperature:** Patient is having hyperpyrexia (104^{o} F)
- **Blood Pressure and Heart Rate:** Tachycardia is present

Neurological Examination:

- **Mental Status and Cognitive Function:**
- **Orientation:** she is disoriented based on her complaints)

Cranial Nerves:

- **Visual Examination:** Mrs.Akila was reported as difficulty with "not opening her eyes fully."
- **Eye Movements:** Nystagmus or impaired eye movements.
- **Motor Examination:**
- **Tone:** Hypotonia, as autoimmune encephalitis can lead to muscle weakness or rigidity.
- **Strength:** she showed weakness & difficulty in movements

➢ **Tremors:** involuntary movements such as tremors is present.

Sensory Examination:

➢ **Light Touch, Pain, and Temperature Sensation:** Increased basal body temperature is noted.

Psychiatric Examination:

➢ **Mood:** Observe for signs of depression: sadness
➢ **Thought Process and Content:** There is evidence of visual hallucination. The client claims that she is seeing images of her deceased mother.
➢ **Insight and Judgment:** Awareness of her illness and her ability to make appropriate decisions.

Musculoskeletal System:

➢ **Range of Motion:** presence of joint stiffness which accompany with tremors.

TYPES OF ABNORMAL MOVEMENTS:

There are two main types of abnormal movements:

- Hyperkinetic movement.
- Hypokinetic movement.

A movement disorder can have both of these or just one.[5]

HYPERKINETIC MOVEMENT:

Increased movement is a feature of hyperkinetic movement disorders. "Kinetic" means "motion," and "hyper" implies "over" or "beyond." It may result in involuntary movement (activities beyond your control) or alter voluntary movement (actions you choose to perform).

Hyperkinetic movement types include:

• **Akathisia**: This condition causes internal restlessness that makes it difficult to sit or stay motionless. The use of some medications, particularly antipsychotic (neuroleptic) drugs, is linked to akathisia.

• **Ataxia**: The disorder is characterized by a serious lack of coordination, which makes someone move clumsily, awkwardly, or uncertainly. Ataxia may be a disease in and of itself or a sign of another illness. It is a far more prevalent symptom.

• **Chorea**, **Ballism and athetosis:** chorea is a movement disorder characterized by erratic, uncontrollable muscular movements. One may appear to be dancing, restless, or fidgety because to the disease. It frequently occurs in Huntington's illness. Athetosis is characterized by a steady stream of sluggish, wriggling, or twisting movements that typically involve the hands and feet. Typically, ballism entails more strenuous motions, including hurling one arm or leg with force.

• **Dystonia**: This condition is characterized by prolonged or sporadic muscle contractions that result in aberrant, frequently repetitive postures or movements. A common sign of cerebral palsy and a number of neurodegenerative diseases is dystonia.

• **Myoclonus**: This condition is characterized by sudden, uncontrollable muscle jerking or twitching. Muscles that suddenly tighten (positive myoclonus) or relax (negative myoclonus) are seen in those who have myoclonic twitches or jerks.

• **Stereotypes** (stereotypic motions): Stereotypes are intricate movements that typically include both sides of the body. They have a pattern and consistently have the same or strikingly similar appearance. Rocking, pacing, hand flapping, and torso gripping are a few examples. Many disorders, such as Rett syndrome and autism spectrum disease, can exhibit stereotypes.

• **Tics**: Tics is a repetitive, structured, non-rhythmic sport. Simple tics only affect a small group of muscles and are short. Blinking, head jerking, throat clearing, facial scrunching, and groaning are a few examples. Complex tics might use more muscles and last longer. Saying specific words or phrases and hopping are two examples. Although they can occur in other illnesses, tics are a component of Tourette's syndrome.

HYPOKINETIC MOVEMENT:

Slower or reduced movement is a feature of hypokinetic movement disorders. "Hypo" implies "beneath" or "below." In general, voluntary movement is impacted.
The primary cause of hypokinetic movement is Parkinsonism. It is a general term for brain disorders that result in tremor, stiffness, delayed motions, or issues with balance.
Parkinson's disease is the most prevalent cause of neurodegenerative parkinsonism, although it can also be a symptom of the following illnesses:

- Atrophy of several systems
- Degeneration of the cortico basal area
- Supra nuclear palsy that makes progress
- Dementia with Lewy bodies

A lack of blood flow to certain parts of the brain, toxic substances, psychiatric medication use, and recurrent head injuries can all cause Parkinsonism. Another hypokinetic movement is bradykinesia. It entails moving slowly and quickly as well as making gradual pauses or stops as the individual goes. It’s one of the main signs of Parkinson’s disease.

TYPES OF MOVEMENT DISORDERS:

There are several movement disorders.[5] Some include:

- **Essential tremor**: Essential tremor causes parts of your body to shake uncontrollably. It usually affects your hands and arms but can also affect your head, voice and other body parts.
- **Huntington's disease**: Huntington's disease is a genetic condition that affects your brain, causing unsteady and uncontrollable movements (chorea) in your hands, feet and face. Symptoms get worse over time.
- **Multiple system atrophy (MSA)**: MSA is a rare condition that causes certain brain areas to deteriorate. It may cause ataxia and parkinsonism.
- **Parkinson's disease**: Parkinson's disease is a brain disorder that causes unintended or uncontrollable movements and difficulty with balance and coordination. It also causes cognitive (mental) decline.
- **Periodic limb movement disorder (PLMD)**: PLMD involves repetitive limb movements that occur during sleep and may cause sleep disruption. The limb movements usually involve your lower extremities, consisting of extension of your big toe and flexion of your ankle, knee and hip.
- **Progressive supra nuclear palsy (PSP)**: PSP is a rare neurodegenerative disorder that damages certain areas of your brain. It affects how you walk, think, swallow and move your eyes.
- **Restless leg syndrome (RLS)**: RLS is a sleep disorder that causes an intense, often irresistible urge to move your legs (and even your arms or body). It occurs along with other sensations in your limbs like pulling, creeping, tugging, throbbing, itching, aching, burning or crawling.
- **Rett's syndrome**: Rett's syndrome is a rare genetic condition that affects speech, purposeful hand use and coordination.
- **Tardive dyskinesia**: Tardive dyskinesia can result from taking antipsychotic (neuroleptic) medications for many years. It can cause involuntary facial tics. It can also cause uncontrollable movements like lip-smacking.
- **Tourette syndrome**: Tourette syndrome is a neurological disorder that affects your brain and nerves. It causes you to make sudden movements or sounds (tics) and is accompanied by anxiety, ADHD and often obsessive-compulsive disorder.
- **Wilson disease**: Wilson disease is a rare genetic condition that happens when your body accumulates too much copper, especially in your liver and brain. It can cause stiff muscles, tremors and uncontrolled movements.

The two most common movement disorders are Parkinson's disease and essential tremor.

CAUSES:

Movement disorders can be caused by a wide range of conditions[2], such as:
• **Genetics**. A gene mutation may be the cause of some movement problems. A child inherits the mutated gene from a parent. We refer to this as a hereditary condition. Two hereditary movement diseases are Huntington's disease and Wilson's disease.

• **Drugs**. Movement abnormalities can result from medications like anti-seizure and anti-psychotic medications.

• **Illegal substances or excessive alcohol consumption**. Movement disorders like chorea can be brought on by illegal drugs like cocaine. Excessive alcohol use might result in ataxia or chorea.

• **Inadequate intake of specific vitamins.** Movement disorders can result from vitamin deficiencies, which are low levels of specific vitamins in the body. Vitamin B1, B12 and Vitamin D may cause ataxia.

• **Health issues**. Movement problems can be brought on by a number of illnesses, including viral encephalitis, multiple sclerosis, stroke, and thyroid issues. Movement abnormalities can also result from brain tumors.

• **Damage to the head**. Movement abnormalities may result from head damage sustained during an injury.

SYMPTOMS OF MOVEMENT DISORDERS:

The symptoms of movement disorders vary widely. All movement disorders cause abnormal movements. Some movement disorders have other symptoms, such as thinking and mood changes.[5] The symptoms can range in severity from barely noticeable to disruptive.

In general, signs and symptoms of movement disorders include:

- Episodes of uncontrolled movement, like twitches, spasms, tremors, jerks, twisting and shaking.
- Problems with coordination and balance.
- Trouble with certain movement tasks, such as writing, swallowing or speaking.
- Difficulty walking or changes to your gait.
- Stiffness or rigidity of your limbs and trunk.

Abnormal movements can affect one or more of several parts of the body, including:

- Limbs.
- Hands and fingers.
- Feet and toes.
- Facial muscles.
- Head and neck.
- Trunk and posture.
- Voice.

DIAGNOSTIC EVALUATIONS:

A thorough history, physical examination, and neurological examination will be the first things to make diagnosis. Any of these tests could be useful in making a diagnosis based on the symptoms. Blood testing to rule out other causes or aid in the diagnosis of specific movement problems. [3]

➢ Electromyography (EMG) to evaluate the condition of your nerves and muscles

- Electroencephalogram (EEG) to measure your brain's electrical activity
- A lumbar puncture for cerebrospinal fluid analysis
- Muscle biopsy to differentiate between disorders of the muscles and nerves
- A study of nerve conduction measures the electrical current that passes through a nerve before it reaches a muscle
- Computed tomography (CT)
- Magnetic resonance imaging (MRI).

MANAGEMENT AND TREATMENT:

The treatment for movement disorders varies based on the type. Most movement disorders don't have a cure, so the goal of treatment is to manage symptoms. But some movement disorders, such as medication-induced parkinsonism, are often treatable. [6]

Examples of treatments for movement disorders include:

- **Medication**: Several medications can help the symptoms of movement disorders. For example, muscle relaxants can help with spasticity. Dopaminergic medications may help with Parkinson's disease and restless leg syndrome. Antianxiety medications may help with dystonia. There are also specific medications for specific conditions.
- **Physical therapy**: Physical therapy helps improve how your body performs physical movements. Physical therapists help you manage symptoms like pain, stiffness and discomfort that make it hard to move.
- **Occupational therapy**: Occupational therapy helps improve your ability to perform daily tasks. An occupational therapist helps you learn how to safely stand, sit, move or use different tools to participate in your activities.
- **Mobility aids**: Mobility aids, like canes, walkers and wheelchairs, can help you move more safely and increase your independence.
- **Speech therapy**: Speech therapy helps improve your speech, language skills and swallowing ability.
- **Psychotherapy**: Psychotherapy (talk therapy) is a term for a variety of treatment techniques that aim to help you identify and change unhealthy emotions, thoughts and behaviors. Movement disorders often lead to mental health conditions, like depression and anxiety. Psychotherapy can help.
- **Botulinum toxin (Botox®) injections**: These can help relax your muscles if you have dystonia or spasticity.
- **Deep brain stimulation**: This is a brain surgery for people with advanced Parkinson's disease, dystonia and other tremors. It may reduce involuntary movements.
- **Clinical trials**: Clinical trials are a type of research that studies new tests and treatments for specific conditions. There may be a clinical trial you can be a part of.

PROGNOSIS:

No two people with a movement disorder are affected in the same way. The best way to know what to expect is to talk to healthcare providers who specialize in researching and treating your condition. [2]

NURSING MANAGEMENT:

1. Nursing Management:

The role of nurses is critical in the management of patients with complex conditions like autoimmune encephalitis, as it requires a holistic and patient-centered approach.

A. Assessment and Monitoring:

➢ **Neurological Assessment:** Monitor for any changes in her neurological status, including consciousness, orientation, speech, and motor functions. Regularly assess her level of confusion and cognitive status using tools like the **Mini-Mental Status Examination (MMSE)** or **Montreal Cognitive Assessment (MoCA)**.
➢ **Vital Signs Monitoring:** Regular checks for fever, blood pressure, heart rate, respiratory rate, and oxygen saturation to monitor for complications related to autoimmune encephalitis or secondary infections.
➢ **Mobility and Gait:** Regularly assess her gait and level of mobility. Observe her ability to stand, walk, or perform activities of daily living (ADLs) independently.
➢ **Swallowing and Nutrition:** Given her poor food intake, monitor her nutritional status and signs of **dysphagia** (difficulty swallowing). Use a **Mini Nutritional Assessment (MNA)** and refer to a speech therapist for evaluation if needed.

B. Interventions:

Promote Safety:

- **Fall Prevention:** Mrs. Akila's unsteady gait and weakness put her at risk of falling. Ensure she has assistance when moving or standing. Implement fall-prevention measures such as non-slip socks, ensuring a clutter-free environment, and using mobility aids (e.g., walker or wheelchair).
- **Monitor for Seizures:** Autoimmune encephalitis can lead to seizures, so ensure appropriate safety precautions (padding the bed, side rails).

Mobility Support:

- **Assistive Devices:** Provide mobility aids such as a walker or cane to support her unsteady gait and prevent falls.
- **Rehabilitation:** Work with physical therapists to develop a plan for rehabilitation and physical therapy aimed at improving strength, balance, and mobility.

Nutrition and Hydration:

- **Monitor Food Intake:** Offer small, frequent meals and ensure she is eating a balanced diet. If necessary, work with a dietician to address her nutritional needs.
- **Encourage Fluids:** Help her stay hydrated, especially if she's experiencing difficulty swallowing.
- **Gastrostomy Tube (if required):** If swallowing difficulties worsen, consider a feeding tube to ensure adequate nutrition.

Skin Care:

- Due to reduced mobility, ensure regular repositioning to avoid pressure sores.
- Maintain proper skin hygiene and moisture to prevent breakdown, especially for bedridden patients.

C. Emotional and Psychological Support:

Depression Management:

- **Assess Mood:** Regularly assess Mrs. Akila's mood and mental status. Use a tool like the **Beck Depression Inventory** to gauge the severity of depressive symptoms.
- **Therapeutic Communication:** Encourage open discussions with the patient about her feelings, fears, and emotional well-being. Offer empathy and emotional support.
- **Psychiatric Interventions:** Provide a calm, reassuring environment to help reduce anxiety. Consider interventions like **cognitive behavioral therapy (CBT)**, as recommended by a psychiatrist or psychologist.
- **Address Family Issues:** Since Mrs. Akila has reported stress due to family issues, offer family counseling or support groups to help them cope with her condition. Engage with her husband for insight into her stress factors and involve him in care decisions and her emotional support.

D. Patient Education:

- **Teach about the Condition:** Educate Mrs. Akila and her family about autoimmune encephalitis, its symptoms, and treatment options. Clear information about the disease process can help reduce fear and anxiety.
- **Medication Education:** Provide information on prescribed medications, including immunosuppressants, steroids, and antidepressants. Educate her and her family on side effects, dosage schedules, and the importance of adherence to therapy.
- **Self-care and Coping Strategies:** Teach coping mechanisms and relaxation techniques to help manage stress and depression. Provide information on exercise, relaxation, and other stress reduction techniques.

Nursing Care Plan Summary:

Diagnosis: Movement disorder, autoimmune encephalitis, and depressive disorder.

Nursing Goals:

- Prevent falls and improve mobility.
- Manage symptoms of depression and improve emotional well-being.
- Ensure nutritional needs are met and support hydration.
- Educate the patient and family on the disease process and treatment plan.

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