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Case Reports

Hansen's disease Like Sensory Loss Following Chikungunya Infection: A Rare Manifestation

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Chikungunya means "that which bends up," indicating severe incapacitating arthritis or polyarthralgia. It is a viral infection caused by the chikungunya virus (CHIK V) belonging to the family *Togaviridae* and is transmitted by the mosquitoes *Aedes aegypti* and *Aedes albopictus*. It is a self-limiting condition with a high fever of up to 40°C (104°F), debilitating arthritis/polyarthralgia, and cutaneous involvement. CHIK V virus affects the joints causing tenosynovitis and enthesopathy presenting as arthralgia. Leprosy is also associated with the loss of sensation, arthritis/arthralgias including involvement of several joints and tenosynovitis specially during reactions. Apart from leprosy, numerous other conditions can present with loss of sensation, which must be ruled out while considering leprosy. We report two patients with chikungunya who presented with a loss of sensation like leprosy.

Keywords : Leprosy, Chikungunya Fever, Paresthesia, Sensory Examination

Introduction

Chikungunya means "that which bends up, "indicating severe incapacitating arthritis or polyarthralgia (de Lamballerie et al 2008). It is a viral infection caused by chikungunya virus (CHIK V), which belongs to the family *Togaviridae,* and is transmitted by the mosquitoes *Aedes aegypti* and *Aedes albopictus* (Mohan 2006).

It is a self-limiting condition with a high fever of up to 40°C (104°F), debilitating arthritis/ polyarthralgia, and cutaneous involvement (Bhat et al 2011). The various mucocutaneous features are morbilliform erythema or maculopapular rash, aphthous-like ulcers, hyperpigmentation, desquamation, exacerbation of existing dermatosis and vesiculobullous eruptions (Bhat et al 2011, Bandyopadhyay & Ghosh 2010). CHIK V virus affects the joints causing tenosynovitis and enthesopathy, resulting in arthralgia and associated paresthesia of the overlying skin (Jaffar-Bandjee et al 2009).

Chikungunya is also associated with cardio-vascular, pulmonary, renal, hepatic, neurological, gastrointestinal and adrenal systems, which are collectively termed "Atypical features" (Economopoulou et al 2009). Neurological involvement is considered the most common severe complication of chikungunya infection. An increased number of chikungunya cases with neurological associations have been reported recently. Though the exact cause is unknown, the neurological features could be due to the inappropriate immunological response or the persistence of the chikungunya virus (Condon

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Table 1 : Conditions associated with loss of sensation

Conditions	Definition	Aetiology	Clinical Features	Investigations
Hansen's disease	It is a chronic disease caused by *Mycobacterium leprae*, infectious in some cases, and affecting the skin, the peripheral nervous system, and certain other tissues.	Infection with *Mycobacterium leprae*	There are three cardinal signs for the diagnosis of leprosy. They are, • Hypoanesthetic / anaesthetic skin lesions • Thickened peripheral nerves with sensory impairment in the area supplied. • Acid-fast bacilli (AFB) in the skin smear	• Slit skin smear • Skin biopsy • Nerve biopsy • Histamine test • Serology including anti-phenolic glycolipid (PGL-1) antibodies/ antigen detection • Molecular diagnostic techniques including polymerase chain reaction (PCR) for M leprae specific components like RLEP
Carpal tunnel syndrome	Entrapment of median nerve passing through the wrist	• Size of the carpel tunnel • Pregnancy • Occupations (exposure of hand and wrist to high pressure, repetitive work, vibrating tools)	• Pain and paresthesia in hand and fingers (mainly the outer 3 fingers) • Worsening pain following repetitive wrist movement	• Nerve conduction test • Electro-myography (EMG)

Cubital tunnel syndrome	Ulnar nerve neuropathy manifests as shooting pain, numbness, and tingling sensation along the medial aspect of the forearm, and the medial half of the fourth and fifth digit occurs due to the compression of the ulnar nerve at the elbow	• Systemic co-morbidities (thyroid dysfunction, obesity, rheumatoid arthritis and diabetes mellitus) • Pressure: Pressure on the ulnar nerve • Stretching: The ulnar nerve is located behind the medial epicondyle. Due to this anatomical location, the ulnar nerve gets stretched during elbow joint flexion, causing nerve damage. • Injuries: Injuries like swelling, fractures, effusions, and dislocations to the elbow joint can result in anatomical damage causing irritation/ compression of the ulnar nerve	• Point tenderness and pain at the medial aspect of the elbow • Paresthesia in the sensory distribution of the ulnar nerve, including the ulnar fourth and entire fifth finger. • Muscle weakness • Muscular atrophy • Difficulty in daily activities like holding a pencil • Motor weakness • Wasting of the hand muscles	Bedside tests: • Tinel's sign • Elbow flexion test Other investigations: • Nerve conduction studies • Radiographs • Electro-myography (EMG)

Meralgia Paresthetica	Compression of the lateral femoral cutaneous nerve (LFCN) of the thigh along its course in the inguinal region.	1) Idiopathic: • Mechanical factors: Pregnancy, obesity, tight clothes, seat belts, scoliosis, direct trauma, muscle spasm, scoliosis and leg length changes.	Site: Lateral or anterolateral thigh. • Pain • Numbness • Burning • Coldness • Muscle aches • Lightening pain • Itching	• Diagnostic nerve block • Electro-diagnostic testing • Neurophysio-logical studies (Somato-sensory evoked potentials and sensory nerve conduction) • Pelvic compres-sion test • Neurodynamic testing • Tinel's sign • Magnetic Resonance Imaging (MRI
Syringomyelia	A disorder where the tubular cavity (syrinx), located in the central region of spinal cord, gradually expands resulting in progressive myelopathy	Conditions causing alteration in the physiologic CSF circulation dynamics. 1) Idiopathic syringomyelia: Syrinx without any identifiable cause. 2) Secondary syringomyelia: Developmental: Obstruction at the foramen magnum Acquired: Syringomyelia with other spinal cord disorders	• Radicular pain • Sensory loss • Spasticity • Weakness • Atrophy and fasciculations of the arms and hands. Associated scoliosis	• Magnetic Resonance Imaging (MRI) • CT myelogram

Diabetic neuropathy	It is defined as symptoms and signs of peripheral neuropathy in a patient with diabetes mellitus (DM), where other causes of peripheral neuropathy have been excluded.	All types of diabetic patients can develop neuropathy. They include, • Insulin dependent diabetes mellitus (IDDM) • Non-insulin dependent diabetes mellitus (NIDDM) Secondary diabetes	1) Distal symmetrical polyneuropathy (DSPN): • Commonest type • Sensory impairment manifesting as numbness, pain, tingling, weakness in the glove and stocking distribution • Motor impairment less prominent 2) Painful diabetic neuropathy:	• Impaired glucose tolerance test • Muscle power assessment • Sensory examination (touch, temperature, pinprick and joint position) • Vibration tests • Autonomic function test • Skin biopsy • Nerve biopsy • Confocal corneal microscopy • Nerve conduction studies
Tangier's disease	A genetic disorder where severe deficiency or absence of high-density lipoprotein (HDL) in the circulation leading to tissue accumulation of cholesteryl esters all over the body, predominantly in the reticuloendothelial system.	• Autosomal recessive genetic disorder	• Hyperplastic yellow-orange tonsils • Hepatosplenomegaly • Coronary artery disease • Corneal opacities • Lymphadenopathy • Thrombocytopenia • Peripheral neuropathy: 1) Multifocal mono- or polyneuropathy	• Very low HDL-cholesterol levels • Very low or absent plasma apo A-I concentration • Small or absent alpha band on lipoprotein electrophoresis

			2) Syringomelia-like neuropathy (muscle wasting, weakness, loss of temperature and pain sensation affecting the upper extremities predominantly)	
Cryoglobulinemia	Cryoglobulins are single or mixed immunoglobulins, that precipitate reversibly at cold (temperature below 37 degree Celsius) and dissolve upon rewarming.	• Infections (hepatitis B, C and HIV) • Connective tissue disease • Hepatic disorder • Drugs	• Palpable purpura • Cold urticaria • Urticarial vasculitis • Livedo reticularis • Raynaud's phenomenon • Skin ulcers • Acral ischemia and gangrene • Arthralgia • Synovitis • Serositis • Peripheral sensory and motor polyneuropathy (manifesting as foot drop or paresthesia) • Glomerulonephritis	• Viral serology for hepatitis B and C infections • Immunoblotting • Immunofixation • Capillary zone electrophoresis • Two-dimensional gel electrophoresis • Skin biopsy • Urinalysis • Rheumatoid factor levels
Chikungunya infection	It is an acute febrile illness with severe polyarthralgia, caused by an arthropod-borne chikungunya virus (CHIK V), which	It is a viral infection, caused by chikungunya virus (CHIK V) belonging to the family *Togaviridae*, and is transmitted	• High fever up to 40'IC (104'IF) • Debilitating arthritis / polyarthralgia • Cutaneous manifestations	• Reverse transcriptase polymerase chain reaction (RT-PCR) • Enzyme-linked immuno

	is transmitted to humans through an infected mosquito bite.	by the mosquitoes *Aedes aegypti* and *Aedes albopictus*	• Systemic involvement	sorbent assays (ELISAs) • Immuno fluorescence assays • Plaque reduction neutralization test (PRNT)

& Rouse 1995). Encephalitis is the most frequently manifested neurological complication, followed by peripheral neuropathy, myelopathy, myeloneuropathy, and myopathy (Chandak et al 2009).

Leprosy is a disease which can present with loss of sensation apart from multiple other manifestations. Loss of sensation can occur in many different conditions, which must be considered while examining a leprosy patient. We report two cases who developed loss of sensation following chikungunya.

Case Report: 1

We report a 43-year-old female who developed transient loss of sensation over the left little finger, which lasted for around five days, and persistent loss of sensation over the plantar aspect of the left great toe for three months. There was no history of using tight footwear. The patient was distressed because of the loss of sensation.

Sensory examination revealed loss of pain sensation over the plantar aspect of the left great toe. Hansen's disease was suspected. However, there was no muscle wasting, no motor impairment, and peripheral nerves were not tender or thickened. The examination did not reveal any hypopigmented patches. There was a history of high-grade fever associated with polyarthralgia for three months. She was diagnosed clinically with chikungunya fever which was confirmed by serology. The serology for dengue was negative.

Case Report: 2

A 51-year-old female presented with loss of sensation over the fingers of her right hand, which was more marked over the little and ring fingers for the past 15 days. The sensory loss was perceived more during the morning hours. Hansen's disease was considered, but hypoanesthetic patches were not observed on examination. Peripheral nerves were not tender or thickened. Sensory examination revealed loss of sensation to touch and pain over the right hand little and ring fingers. No muscle wasting or motor impairment was observed. History revealed having a fever one month back, which was diagnosed as chikungunya by clinical and serological evaluation.

Discussion

Nutritional deficiency, alcohol and drug abuse, and hansen's disease are important causes of loss of sensation. However, loss of sensation has also been reported in compressive neuropathy disorders (carpal tunnel syndrome, cubital tunnel syndrome, meralgia paresthetica), radiculopathy, pressure paresis of nerve, syringomyelia, small fibre neuropathies (hereditary sensory

neuropathy type I and II, diabetic neuropathy, tangier's disease), cryoglobulinemia (Madhusudan 1999). Also, occupations leading to vibration injury (frequent rotor usage and clinical micromotor by dentists, stone cutters, riveters, typists, and pianists) can lead to loss of sensation (Srinivas et al 1987). We encountered patients with loss of sensation following chikungunya fever, and we arrived at the diagnosis based on the criteria in the Table 1.

Conclusion

Awareness of various causes of loss of sensation is vital to prevent the misdiagnosis of leprosy. We suggest that a history of chikungunya should be obtained when patients report loss of sensation.

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