



Neuropathic Tremor Secondary to Guillain Barre Syndrome-a Case Study

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Abstract

Neuropathic tremor (NT) is a movement disorder characterized by tremor occurring in the isolated context of peripheral neuropathy. It consists of a postural and/or kinetic tremor affecting the distal upper extremities. The pathology of Neuropathic tremor is not well defined and the etiology is broad, but neuropathy and tremor severity are not related. Guillain-Barré syndrome (GBS) is an acquired heterogeneous group of disorders due to an immune-mediated inflammation and demyelination of the peripheral nervous system. We reported a case of young girl presented with the kinetic tremors following GBS after 6 months. After the detailed Clinical evaluation we reached the diagnosis of Neuropathic tremor. She showed no significant difference on therapeutic trials of propranolol, although tremor improved spontaneously over the course of 3 months. To our knowledge this is the first case report of neuropathic tremor following GuillainBarre Syndrome.

Keywords: Guillain Barre Syndrome; Neuropathic tremor; Peripheral Nervous system.

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1. Introduction

Guillain-Barré syndrome (GBS) is a demyelinating polyradiculoneuropathy that occurs due to an autoimmune inflammation of the peripheral nervous system, preceded by an illness in two-thirds of the patients, commonly an infection [1-3]. It usually presents with acute onset, rapidly progressive symmetrical ascending flaccid paralysis of limbs associated with absent or reduced deep tendon reflexes. Sensation and cranial nerve function might be impaired whereas autonomic dysfunction and respiratory compromises encountered rarely [4]. Neuropathic tremor (NT) is a movement disorder typified by tremors occurring in the isolated context of peripheral neuropathy. It mostly consists of a postural and/or kinetic tremor affecting the distal upper extremities with a typical frequency range between 3 to 6 Hz after complete recovery. The pathogenesis of Neuropathic tremor is not well defined and the etiology is broad, yet tremor severity has no relationship with neuropathy [5]. Here we describe a case of a young girl who presented with Neuropathic tremor after recovery from Guillain Barre Syndrome. A literature search revealed tremor occurring during neuropathy and secondary to Chronic Inflammatory Demyelinating Polyradiculopathy (CIDP) [6]. but no such case occurring after Guillain Barre syndrome was reported, hence to our knowledge this is the first case reported of its nature.

2. Case Presentation

A 17-year old Pakistani girl admitted to Liaquat national hospital in December 2016 presented with a 3 day history of generalized progressive weakness in all four limbs and 1 day history of difficulty in walking. She had a history of acute diarrhea 2 ½ weeks prior to the onset of symptoms, which had resolved after 2-3 days without any intervention. There were no other significant past medical problems, and no history of trauma. No bowel and no bladder were reported. On examination, she was conscious, oriented in time place and person. On physical examination, cranial nerve function was normal. Upper limb neurological examination demonstrated power of grade 3/5 both proximally and distally and a lower limb power of 4/5 proximally and 3/5 distally. Reflexes were not elicited even after reinforcement and planters were flexors bilaterally. Sensation of both upper and lower limbs was intact and muscle tone was flaccid. The patient was able to stand albeit with support. She could walk but only with support. There were no cerebellar signs and no signs of meningeal irritation. A clinical diagnosis of Guillain Barre Syndrome was made and Nerve conduction study (NCS) was suggestive of early neuropathy which in appropriate clinical context was consistent with diagnosis of Guillain Barre Syndrome. Cerebrospinal Fluid Analysis revealed protein of 76mg% sugar 65mg% and White Blood Cell of 5 and no organism seen on gram stain. This Cerebrospinal Fluid analysis showed cyto-albuminic dissociation consistent with diagnosis of GBS. Routine blood chemistry and Complete Blood Count was normal.

Table 2.1: Complete Blood Count

Parameter	Unit	Value	Reference value
WBC count	Mm3	6000	4000-10000
RBC	Million/mm3	5	4.5-6
Hemoglobin	g/dl	14	14-18
Hematocrit	%	42	40-50
MCV	-	95	82-98
MCH	-	30	27-31
MCHC	-	33	32-36
RDW	-	14	11-16
platelets	Per mm3	231000	140000-450000
Neutrophils	%	69	40-75
Lymphocytes	%	35	15-45
Monocytes	%	3	2-12
Eosinophils	%	4	2-6
Basophils	%	1	0-1

Table 2.2: Cerebrospinal Fluid Analysis

Parameter	Unit	Result	Reference value
Colour	-	clear	Clear and colourless
pressure	cmH2O	15	5-20
WBC	Per liter		0-4 *106
RBC	Per liter	1	0-4 *106
Glucose	Mmol/l	2	2.8-4.4
Protein	g/l		0.15-0.45
Gram stain	-	negative	-

Table 2.3: Complete Metabolic profile

parameter	unit	Result	Reference value
Glucose	mg/dL	100	70-140
Magnesium	mmol/L	1.6	1.5-1.9
Blood urea nitrogen	mmol/L	6	1.7-8.3
creatinine	µmol/L	102	66-112
Sodium	mmol/L	140	135-145
Potassium	mmol/L	4.2	3.5-5.1
Bicarbonate	mmol/L	24	22-29
calcium	mg/Dl	9.7	8.6-10.3
chloride	mmol/L	104	98-107

Table 2.4: Thyroid Profile

parameter	Unit	result	Reference value
TSH	mU/L	3.5	0.2-4.5
T3	Pmol/L	5.5	2.6-6.2
T4	Pmol/L	15	9-21

She was started on IVIG on a dose of 0.4g per kg/day for 5 consecutive days. She simultaneously received daily physiotherapy and occupational therapy to improve her muscle strength, ambulation and manual dexterity.

She was finally discharged in January 2017. She could walk a few steps with support but experience frequent falls due to muscle weakness. She was totally dependent on activities of daily living. Her subsequent follow up 3 months later revealed residual weakness of Quadriceps and ilio-psoas muscles for which she was advised strengthening exercises. At the next follow up on in July 2011 she reported a tremor of her hands which was making it difficult for her to write and fine motor skills were being impeded because of this tremor. The tremor had a frequency of 6 hertz. On examination power of upper limb was 4/5 distally and 5/5 proximally. Power of lower limb was 5/5 both proximally and distally. Thyroid function tests were checked which were found to be normal. Cerebellar signs were negative. She was given a 3 month trial of propranolol and alprazolam for which she showed no significant improvement.

3. Discussion

Tremor is involuntary rhythmic muscle contraction causing shaking movements in one or more parts of the body. It is a movement disorder that most commonly affects the hands but can also affect the head trunk, tongue, and leg. Tremor mostly arises from the pathology of basal ganglia however it has also been reported as a complication of neuropathy. Tremor can be classified into resting tremor and action tremor. Resting tremor occurs when the patient is at rest. Action tremor occurs with voluntary movement of muscles. Action tremor is sub classified into the following subtypes, postural tremor, kinetic tremor intention, intention tremor, task specific tremor, isometric tremor. In our patient tremor was basically a kinetic tremor (subtype of action tremor) having a frequency of 6 hertz. Literature search revealed that tremor (neuropathic) can occur in an isolated context of peripheral neuropathy. [6] A case of Neuropathic tremor secondary to Chronic inflammatory Demyelinating Polyradiculopathy was also reported [5]. Neuropathic tremor is a postural and/kinetic tremor affecting the distal upper extremity with a typical frequency range between 3-6hz however the mechanism underlying neuropathic tremor is not well defined. The response to neuropathic tremor is generally poor. In our case the patient was diagnosed as a case of Guillain Barre Syndrome and she developed a postural/kinetic tremor in convalescence. To our knowledge this is the first case report of neuropathic tremor following Guillain Barre Syndrome.

4. Conclusion

Tremor in the recovery phase of Guillain Barre syndrome is uncommon. Its response to treatment is poor. In our case it was classified as neuropathic tremor, the mechanism of which is unknown and etiology is broad.

5. Limitations

Since the study was limited to a single patient suffering from tremor following Guillain Barre Syndrome hence the results cannot be generalized to a wider population.

6. Recommendations

In light of the study it is recommended that medications other than propranolol and alprazolam should be used for tremors following Guillain Barre Syndrome. It is further recommended that more research work should be

done to determine the pathology of neuropathic tremor in order to reach the most suitable treatment for it.

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