

# Generalized tetanus could be complicated with Guillain-Barré syndrome

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**Introduction :** Although its cause is unknown, Guillain-Barré Syndrome (GBS) is thought to be an autoimmune process triggered by antigenic stimulation, resulting in demyelination and destruction of peripheral nerves. There is evidence against an association of GBS with tetanus toxoid-containing vaccine, but the association of GBS with tetanus is Unknown

**Materials and Methods:** A retrospective analysis of patients diagnosed with tetanus who were admitted to Wonkwang University Hospital in South Korea between January 2000 and December 2015, was conducted to examine the occurrence of GBS. The severity of tetanus was classified into mild, moderate, and severe. We diagnosed as GBS using the Brighton criteria.

**Results** During the study period, 13 patients were diagnosed with generalized tetanus. The mean age of these patients was 63.5 (range 38–79) years, and 62% (8/13) were men. The treatments for tetanus included metronidazole (100%, 13/13), tetanus immune globulin (92.3%, 12/13), a benzodiazepine such as midazolam or diazepam (92.3%, 12/13), muscle relaxants (69.2%, 9/13), and wound care (61.5%, 8/13).

Eleven patients (84.6%) underwent airway management (6 endotracheal intubations and 5 tracheostomies). Ten patients (76.9%) were admitted into the intensive care unit (ICU) and received mechanical ventilation (for a range of 3–30 days). One patient (7.7%) died of tetanus. During the study period, 2 cases (15.4%) were complicated with GBS (Table 1). The patients had muscle weakness of the limbs and abnormal deep tendon reflex responses. And, the results of nerve conduction velocity (NCV) testing were strongly suggestive of GBS. (Table 2) After a 5-day infusion of intravenous immunoglobulin, muscle strength in both patients improved from Medical Research Council (MRC) grade 1 to MRC grade 4 or higher .

Table 1. Results of the nerve conduction studies in Case 1.

	Segment	At early stage of the illness		At recovery phase of the illness	
		Latency / NCV (m/sec)	Amplitude (mV)	Latency / NCV (m/sec)	Amplitude (mV)
<b>Motor nerve conduction</b>					
<b>Median nerve, right</b>					
	Wrist	5.7	0.7	3.3	10.2
	Elbow	37.1	0.7	51.3	9.9
	Axilla	38.9	0.6	58.8	9.6
	F-wave latency	No response		25.6	
<b>Ulnar nerve, right</b>					
	Wrist	4.3	1.7	2.8	5.7
	Below elbow	41.5	1.2	65.2	5.6
	Axilla	50	9	62.5	5.2
	F-wave latency	No response		25.68	
<b>Tibial nerve, right</b>					
	Ankle	No response	No response	4.5	5.8
	Knee	No response	No response	42.7	5.6
	F-wave latency	No response		49.95	
<b>Sensory nerve conduction</b>					
<b>Median nerve, right</b>					
	Finger-wrist	37.1	17.1	50	26.4
	Wrist-elbow	43.9	40.8	54.5	31.8
	Elbow-axilla	62.5	112.9	52.6	98.2
<b>Ulnar nerve, right</b>					
	Finger-wrist	51.9	14.9	56.3	17.8
	Wrist-elbow	50	43.4	56.8	26.8
	Elbow-axilla	52.2	34.3	58.8	72.9

Table 2. Characteristics of tetanus patients with Guillain-Barré syndrome

	Case 1	Case 2
Age (years)	71	79
Sex	Male	Female
Type of tetanus	Generalized	Generalized
Identifiable portal of entry	Lower limb	Neck
Severity of tetanus	Severe	Severe
Time from onset of tetanus and GBS (days)	23	8
Duration of ICU stay after onset of GBS (days)	22	6
Previous use of drugs affecting muscle strength	Magnesium sulfate, diazepam	Vecuronium, midazolam
<b>Symptoms and signs at early stage of GBS</b>		
Muscle strength from MRC grading	MRC grade 1 on lower limbs	MRC grade 2 on all limbs
Deep tendon reflex	Not noticed	Diminished
Therapeutic option for GBS	IVIg for 5 days	IVIg for 5 days
Muscle strength after infusion of IVIG	MRC grade 4 on lower limbs	MRC grade 4 on all limbs

**Conclusions** In this study, we show that generalized tetanus can be complicated with GBS. Therefore, a physician should keep in mind that GBS could be an important cause of muscle weakness in patients with tetanus.