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Heavy Metal Curse: A Task-Specific Dystonia in the Proximal Lower Limb of a Professional Percussionist

André Lee, MD, and Eckart Altenmüller, MD, MA

Task-specific musician's dystonia is highly disabling and mostly affects the upper limb or the embouchure. In a recent paper, lower limb dystonia was reported in a drummer, although no details were given as to its phenomenology and electromyography (EMG). In this paper, we report on the case of a 28-year-old drummer with a task-specific dystonia of the right thigh and describe the phenomenology of the dystonia, the EMG recording, and treatment. Furthermore, we discuss stiff leg syndrome and paroxysmal exercise-induced dystonia as two important differential diagnoses. *Med Probl Perform Art* 2014; 29(3):174–176.

Musician's dystonia (MD) is a highly disabling, task-specific dystonia that mostly affects the upper extremity or the embouchure.[1] A recent paper by Katz et al.[2] reported on a series of cases of foot dystonia manifested in various activities including drumming; however, neither a detailed analysis of movement patterns nor electromyography (EMG) was performed. In this paper, we report on the case of a 28-year-old professional heavy metal drummer with a task-specific dystonia of the right thigh and describe the phenomenology of the dystonia, the EMG recording, and treatment. Our case is interesting because we describe the lower limb dystonia in a musician with the aim of raising awareness for this rare but disabling condition.

CLINICAL SUMMARY

A 28-year-old male percussionist presented with increasing difficulties when playing with the right leg. The first symptoms appeared 2 years ago at the age of 26 after he began to play with a stage double bass pedal. The patient described an increasing contraction and tightness of the right thigh and difficulty when playing the double bass pedal, which since then has led to a severe lack of dexterity. The difficulties were most apparent when he tried to play fast patterns rhythmically. Activities apart from the instrument, such as running, walking, or participating in other sports activities, were not affected. There were no problems playing with the left leg.

He started playing at the age of 9 years and, at the time of the examination, still practiced 1 to 2 hours per day with a highly perfectionistic attitude. The patient had no history of psychiatric disorders or neuroleptic medication. His motor development was normal; there was no history of poliomyelitis or spasticity. His family history was negative in regard to neurological disorders. Clinical examination did not reveal any pathological findings. There were no radicular signs, especially at L4. His gait was normal, there were no motor or sensory deficits of the lower limbs, and he had a eudiadochokinesis. There was no Kayser-Fleischer ring. A cranial MRI was normal.

The examination of the patient at his instrument revealed his difficulty when playing fast, repetitive tapping patterns with the right foot (see Fig. 1 video) and an increasing tightness of the right thigh. No dystonic tremor was visible, nor was there a sensory trick. The maximum speed at which regular playing was possible was 4 to 5 Hz for the affected foot and 7 to 8 Hz for the healthy foot. An EMG of the affected side revealed an overflow of EMG activity to the thigh antagonist muscles (quadriceps and biceps muscle) and a coactivation (Fig. 2). There was an alternating pattern for the lower leg antagonist muscles (tibialis anterior and gastrocnemius muscle), which indicates the absence of reciprocal inhibition. At higher speed, a coactivation of the lower leg muscles became apparent in the healthy and affected sides. In neither side were there any signs of a continuous motor unit activity at rest (CMUA) or fibrillations.

Because the stiffness of the right thigh corresponded to the EMG finding and to the impairment at the instrument, we injected 30 MU of incobotulinumtoxin (Xeomin®, Merz Pharma GmbH) into the quadriceps and the biceps, respectively. However, this first injection did not have an effect, so we re-injected a higher amount of 45 MU into each into the same muscles 12 weeks later, which had a slight effect.

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A video associated with this report is available at www.sciandmed.com/mppa/video/29.3.174.

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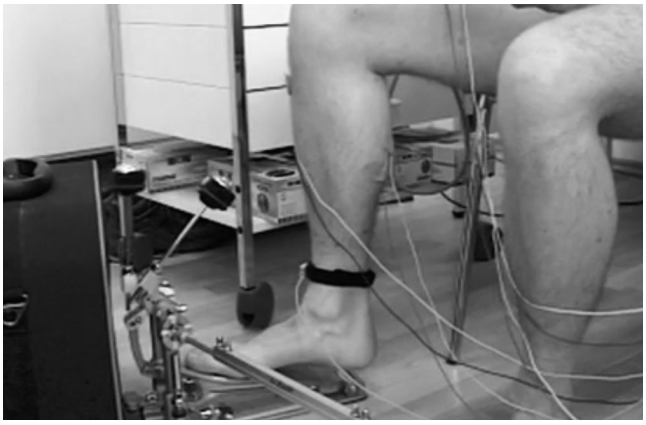

FIGURE 1 video. Percussionist with proximal lower limb dystonia. 0:00–0:15: The patient was asked to play as fast and regularly as possible with the right foot. 0:15–0:27: The same task with the left foot. 0:27–0:55: The same task with the left foot while recording the EMG. 0:55–end: The same task with the right foot while recording the EMG. His difficulty in playing regularly at a high speed with the right foot as compared to the left foot becomes clearly visible and audible. *(Video is available at www.sciandmed.com/mppa/video/29.3.174.)*

DISCUSSION

All of the above presented us with an interesting and rare case of musician's dystonia (MD) of the lower limb in a drummer. In our patient, the proximal lower limb was affected, which itself is a rarity.[3] Similarly to patients with MD of the upper limb, our patient was affected while performing a highly trained task that necessitates rapid, repetitive skilled movements[4] with a high demand on temporospatial precision. There was no obvious abnormal posturing, as is usually seen in patients with foot dystonia while walking. Nonetheless, we consider this to be a case of MD because our patient fulfilled the phenomenological features of a task-specific dystonia (TSD) as described by Torres-Russotto and Perlmutter (painless tightness, lack of dexterity, and abnormal movements during a specific, highly trained task),[4] where no abnormal posturing is mandatory.

We found an increasing coactivation for the lower leg muscles of both sides; we could expect such a finding because it is known that playing at higher speed leads to a higher coactivation of antagonist muscles in healthy musicians.[5,6] One differential diagnosis is a tardive dystonia, which we could rule out, as our patient had no history of psychiatric disorders or neuroleptic medication. Another differential diagnosis is the paroxysmal exercise-induced dystonia.[7] However, in this disorder, dystonic symptoms do not occur with the onset of the task, as in MD, but after prolonged exercise[7] and continue after ending the task. Finally, stiff leg syndrome[8] is a possible differential diagnosis that also is associated with stiffness and spasms of the leg. However, all patients in the study by Brown et al.[8] described the stiffness as painful, whereas our patient had no pain, which again is the usual finding in TSD.[4] Further-

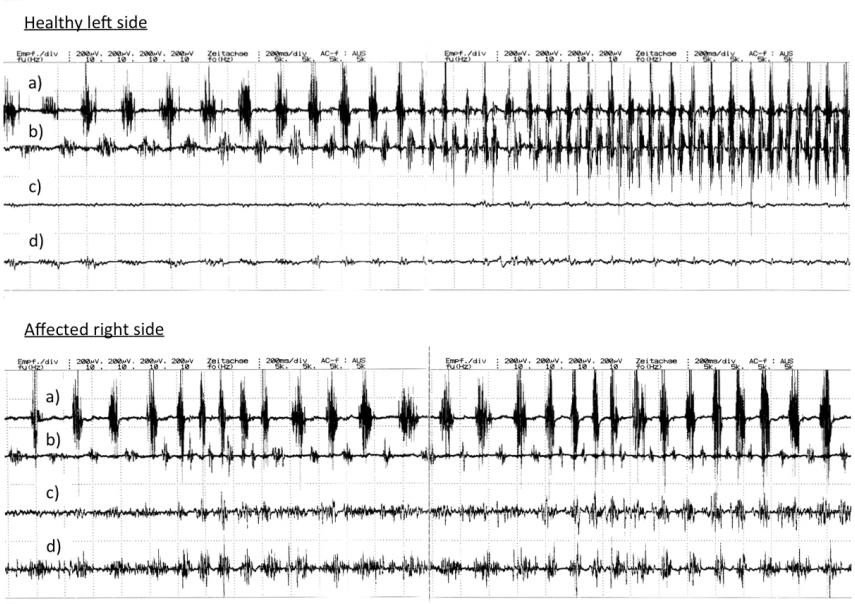

FIGURE 2. EMG of the a) gastrocnemius, b) anterior tibial, c) quadriceps femoris, and d) biceps muscles. The patient was asked to make a uniform accelerando. Paper speed was 200 ms/division. *Top panel* shows the healthy left lower limb: The alternating pattern of the lower leg antagonists is visible with almost no activation of the thigh muscles. The maximum speed is about 8 Hz. An increasing coactivation at maximum speed can be seen for the gastrocnemius and anterior tibial muscles (a and b). *Bottom panel* shows the affected right lower limb: Alternating muscular activation is visible for the lower leg antagonists; however, acceleration is not uniform and maximum speed at which a stable rhythm can be maintained is 4-5 Hz. Additionally, there is a clear coactivation of the thigh muscles.

more the lower limb stiffness in patients with stiff leg syndrome was not task-specific but occurred spontaneously.[8] Finally, one diagnostic criterion for stiff leg syndrome is a CMUA, which we did not find in the EMG of our patient.

However, we did see the coactivation (Fig. 2) of the antagonist muscles, a main feature of TSD.[9–11] Furthermore, our patient fulfills two of the risk-factors for MD[1]: 1) he plays an instrument with high demands on temporospatial precision, and 2) he shows perfectionist tendencies at the instrument. The onset age of 26 years for our patient was younger than the mean onset of 48.38 years for lower limb dystonia[12] or mid-30s for MD[1]. However, another percussionist seen in our outpatient clinic for lower limb dystonia had an onset age of 18 years, and a recent paper reported two percussionists who developed lower limb dystonia at the age of 20 and 23 years, respectively.[13]

Our case is noteworthy because we show that TSD of the proximal lower limb may occur in music-making. Awareness of this condition is important in order not to misdiagnose these cases as having orthopaedic or psychogenic[3] causes.

Conflict of Interest: Dr. med. Lee reports no conflicts of interest. Prof. Dr. med. Altenmüller has research grants from the German Research Foundation (Al 269/5-3, Al 269/7-3), the European Marie Curie Actions, the Lichtenberg Scholarship Program of Lower Saxony, and the Dystonia Medical Research Foundation, and receives honoraria for teaching courses on the application of botulinum-toxin A from Allergan, Ipsen Pharma, and Desitin/Merz.

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