

A Survey of Possible Dystonia among Japanese Musicians

Masahiro Horiuchi

Department of Neurology, Kawasaki Municipal Tama Hospital, 1-30-37 Shukugawara, Tama-ku, Kawasaki-shi, Kanagawa 214-8525, Japan

***Corresponding Author:** Masahiro Horiuchi, Department of Neurology, Kawasaki Municipal Tama Hospital, 1-30-37 Shukugawara, Tama-ku, Kawasaki-shi, Kanagawa 214-8525, Japan .E-mail: m2horiuchi@marianna-u.ac.jp

Abstract

Due in part to a lack of awareness, musician's dystonia is often misdiagnosed, and appropriate treatment is neither sought nor implemented in many cases. This study aimed to identify the characteristics of musician's dystonia in terms of symptoms, coping methods, instruments played, experience/frequency of playing, and various other personal characteristics that may influence the development of dystonia. This study employed a questionnaire-based survey, distributed to professional and amateur musicians through their conservatories, or as outpatients at Kawasaki Municipal Tama Hospital. About 67% of respondents described right hand symptoms. The majority did not seek medical help, but simply took breaks from playing their instrument (or singing). Pianos were the most common instrument played in the survey, and on average respondents reported 15 years of experience. Respondents most often were characterized as serious, patient, and kind; furthermore, the vast majority had little or no knowledge of dystonia. The questionnaire suggests many Japanese musicians are suffering from dystonia related to the extensive practice and playing of their instruments. Dystonia can lead to enough muscle tension to cause premature retirement, or at least difficulty playing, these musicians should be encouraged to identify the source of their symptoms and seek appropriate treatment.

Keywords: Musician, dystonia, questionnaire, coping methods

1. INTRODUCTION

Dystonia is a condition in which increased muscle tone causes abnormal posture and movements [1]. Musician's dystonia often affects the portions of the upper limbs used in playing instruments, especially the fingers, and makes it difficult to play the instrument in question. Although the pathophysiology of dystonia remains unknown, it is believed to lie in repeated abnormal motion subroutines centered in the basal ganglia. In other words, with acquired movements that are frequently repeated, there is often tension in the specific muscle groups that are used so often, and a tendency for the associated joints become fixed at specific angles [1]. Playing a musical instrument is an acquired movement, and one in which repetitive, frequent exercise is common due to the need for practice to maintain one's ability. These movements are done almost unconsciously once established, are often

performed under tension, and hence present a risk of developing dystonia [2]. In Japan, a previous survey of 480 music students found that 29% of the students knew of musician's dystonia, and 1.25% reported having dystonia while performing music [3].

Musician's dystonia is often misdiagnosed as tenosynovitis, and so many musicians are not treated appropriately [1]. To improve the ability to differentially diagnose dystonia in musicians, as well as to determine a better idea of the actual level of need for treatment, a questionnaire-based survey was conducted. The survey aimed to identify aspects of musician's dystonia in the population related to (1) symptoms, (2) coping methods and treatment, (3) the type of musical instruments and the duration for which they had been played, and (4) personal characteristics of the musicians that may represent potential risk factors (e.g., being overly driven to practice due to insecurity).

2. MATERIALS AND METHODS

Table1. Questionnaire and results related to symptoms.

1	Have you ever experienced difficulty performing?			
	Yes (38)		No (28)	
2	(For those who answered “yes” to 1.)		Where does it occur?	
			Right hand	
			Flexion	Extension
			Left hand	
			Flexion	Extension
	Thumb	4	1	1
	Index finger	3	4	2
	Middle finger	5	2	2
	Ring finger	5	3	1
	Little finger	6	5	4
	Turning my arm	Right hand		Left hand
		3		2
Difficulty maintaining good embouchure			7	
Difficulty speakings			2	
Other	<ul style="list-style-type: none"> • When I'm stressed, there is a persistent numbness in my hand • Pain • Pain in the arm • Flexion of the left wrist • Sometimes it is hard for me to tongue the instrument • My neck (face) bends to the right • My neck bends 			
3	What kind of symptoms do you experience?			
	It becomes difficult to move, or my movements become slow	16	I lose control	20
	I get tense or rigid	27	My strength decreases, or I feel weak	2
	Other	<ul style="list-style-type: none"> • As soon as I sit at the piano and stretch my little finger (only on my right hand), sometimes it does not move / I can't stop it from feeling numb • The joint makes a sound • The tongue • My hand bends backwards on its own when I make a fist • I cannot make my mouth go into the shape necessary to play the instrument • I cannot do the arpeggio exercise with the guitar. I feel no inconvenience at all except when I play the guitar. 		
When do the symptoms occur?				
Shortly after starting to play		21	A while after starting to play	5
The same symptoms occur every day		16	When playing in public	10
Even when not playing in public		16		
Other	<ul style="list-style-type: none"> • They always occur, even when practicing. • Irregular • When I practice too much • They also happen when I make similar movements in everyday activities. • All the time • At present, the symptoms are different at different times. • When hitting the keys of a computer keyboard (somewhat) • My tongue is awkward. 			
5	Do the symptoms also appear when you are not playing instruments?			
	Yes	When I imitate performance without an instrument	10	
		When I don't have an instrument (not when imitating a performance)	7	
		When I imagine doing so		
Other	<ul style="list-style-type: none"> • Vocal cord category • When using a computer keyboard • Although I am a guitarist, when playing other instruments such as a piano, and when using a computer keyboard, etc. • When using a telephone or holding a conversation • When I need to use my fingers to perform fine actions, like using a computer keyboard, etc., or requiring fingers to perform minute actions • When holding hands in everyday life • When trying to speak loudly • All the time • When using a keyboard, electronic remote control, or touch panel 			

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	No	13		
6			8	No 30
	<ul style="list-style-type: none"> • A rash always appears on the skin of the part where the symptoms appear, and it begins to hurt when it gets worse. • My fingers themselves do not hurt. 			
7	Is there anything that you think might be the cause?			
	Stress	20	Too much practice	14
	Injury	2	Side-effect of medicine	1
	Other	<ul style="list-style-type: none"> • Cold • Stress • Loss of balance • Nervousness • Habits • Lack of practice • I strain myself too much. • Tiredness • I spend too much time in the cold. • I become self-conscious. 		
	Cause unknown	16		
8	How did it occur?			
	Suddenly	10	Gradually	25
9	How long have these symptoms that make performing difficult been continuing?			
	Less than 1 year	10	1 – less than 3 years	6
	3 – less than 5 years	8	5 – less than 10 years	6
	10 – less than 15 years	4	15 – less than 20 years	2
	20 – less than 30 years	3	30 years or more	
10	Have the symptoms progressed?			
	They are progressing.	The symptoms have gotten worse.	The range has expanded (same side, opposite side).	
		7	3	
	They get better and worse repeatedly.	12		
	They are not progressing.	18		

Table2. Questionnaire and results related to methods of coping and treatment.

11	Do you have any method of addressing the symptoms by yourself?			
	Using rubber bands	2	Using auxiliary tools (bands, coins, rings, etc.)	6
	Changing my fingering	7	Changing my posture	9
	Taking a break	17		
	Other	<ul style="list-style-type: none"> • Playing slowly • Weakness/Reached my limit • Usually when I use a computer keyboard, pinching a pen between my thumb and my index finger stops it from worsening. • I've heard that forcing one's mouth to the right and to the left with all one's strength for 10 seconds at a time can make it better, so I do that repeatedly. • Practicing by replacing poor consonants with good consonants • Feeling with my hand to become aware of the parts of the mouth that become stiff while playing • Using a band (lightly clasp an egg or a golf ball) • Warming it up • Doing it at a slow tempo without rushing • Putting down the musical instrument 		
12	How do you deal with the symptoms?			
	Reducing practice time	15	Increasing practice time	2
	Talking with a friend or teacher	16	Reading a book or searching the Internet	20
	Other	<ul style="list-style-type: none"> • Leaving it as it is • Practicing with breaks • Taking a break • I don't cope with it. • Applying the Feldenkrais Method • Consulting with a doctor • Not playing the piano. I resigned as a piano teacher. • Going to the hospital • There were four specialists at that time (30 years ago). I asked a prominent one among them. • Using other fingers (ring finger) • Under a guitar instructor, I practiced basic fingering, but it was ineffective. • Releasing the tension from the muscles • Visiting a dystonia outpatient clinic and seeing what medicine is available 		
13	Have you been treated for the symptoms?			
	I have.	14		
	I am being treated now.	14		
	I haven't.	12		
14	(For those who answered "I have" or "I am being treated now" to 13.) What kind of treatment			

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was/is it?					
Rehabilitation (by oneself)		9	Rehabilitation (guided)		5
Acupuncture		9	Massage		8
Psychotherapy/Relaxation		6	Using auxiliary tool(s) (splints)		2
Internal medicine		Trihexyphenidyl hydrochloride (trade name: Artane)			16
		Clonazepam (trade name: Rivotril, etc.)			5
		Mexiletine (trade name: Mexitil, etc.)			1
		Baclofen (trade name: Lioresal)			2
		Diazepam (trade name: Cetalgin, etc.)			
		Etizolam (trade name: Depas, etc.)			2
		Other	● Vitamedin ● Taking Myslee 30 minutes before playing		
Botulinum toxin injection		4			
MAB (muscle afferent block) therapy		1			
Surgery	Tendon lengthening				
	Tenotomy				
	Stereotactic surgery	2			
	Deep brain stimulation	1			
Other	● Laser beam injection to the palm of the right hand ● Nerve block injection				
15	Was the treatment effective?				
	Yes	14			
	No	6			
	I don't know.	8			
16	Have you continued playing?				
	Yes	29	No	6	
17	Do you know about a disease called dystonia?				
	I have heard of it.	I have heard its name	10	I know a little about it.	3
	I hadn't heard of it.	43			
18	Do you have any chronic illnesses?				
	● hernia ● schizophrenia ● asthma ● idiopathic hearing loss ● migraine ● hyperlipidemia ● hypertension/hyperlipidemia/diabetes ● allergies				

Table 3. Questionnaire and results related to the musical instrument of choice and musicians' lengths of engagement.

What kind of instrument(s) do you play?			
19	Piano (classical, pop, other)	43	Harpsichord
	Organ		Synthesizer (including Electone)
	Classical guitar (6 strings, 7 strings, 10 strings)	7	Flamenco guitar
	Acoustic guitar (6 strings, 12 strings)	4	Electric guitar (jazz, rock, blues)
	Electric bass	2	Violin
	Viola		Cello
	Double bass		Kokyū
	Harp		Ukulele
	Banjo		Lute
	Mandolin		Shamisen
	Koto		Flute
	Recorder		Oboe
	Bassoon		Clarinet
	Saxophone	4	Shakuhachi
	Shinobue/Nohkan		Gagaku instrument(s)
	Trumpet	2	Horn
	Trombone	5	Tuba/Euphonium
	Drums	2	Timpani

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	Drum	3	Taiko		
	Cymbals/Tambourine	1	Triangle/Gong	1	
	Xylophone/Glockenspiel/Marimba	1	Vocal (classical, etc.)	8	
	Vocal (pop, etc.)				
	Other	● Latin percussion (conga/bongo)			
	Sorry to ask this question, but what is your level?				
20	Professional (occupational)	Only playing	International level		
			Domestic level	2	
		Including lecturers, etc.	International level	2	
			Domestic level	12	
		I engage in work other than music.	2		
	Semi-professional	Music is not my main work, but I also perform on stage as a professional.			9
	Amateur	5			
	Student	Majoring in Music, international level	1		
		Majoring in Music, domestic level	2		
		Majoring in Music, average level	29		
	Majoring in something other than Music	2			
	Other	● Student and restaurant piano player ● 66 years old and retired			
	How long have you been playing?				
21	Less than 1 year		1 – less than 3 years	3	
	3 – less than 5 years	2	5 – less than 10 years	7	
	10 – less than 15 years	19	15 – less than 20 years	8	
	20 – less than 30 years	7	30 – less than 40 years	11	
	40 – less than 50 years	7	50 years or more	2	
	How long do you practice each day?				
22	Less than 1 hour	14	1 – less than 2 hours	18	
	2 – less than 3 hours	15	3 – less than 4 hours	10	
	4 – less than 5 hours	3	5 – less than 6 hours	6	
	6 – less than 7 hours		7 – less than 8 hours	1	
	8 – less than 9 hours		9 – less than 10 hours		
	10 hours or more		● It is different each day. ● I have not practiced for over 10 years. Before I stopped practicing I used to practice for 1 to 2 hours a day.		

Table 4. Questionnaire and results related to personality and demographic characteristics of the respondents.

	How would you describe your own personality? How would your parents, siblings, colleagues, and/or teachers describe your personality?									
	Methodical	15	Serious	38	Honest	12	Patient	26	Modest	7
	Cheerful	16	Kind	22	Shrewd	5	Sensitive	13	Courageous	1
	Attentive	14	Persistent	11	Funny	10	Insensitive	3	Dull	10
	Nervous	17	Insincere	3	Untrustworthy	1	Selfish	16	Determined	10
	Melancholic	2	Malicious	2	Self-centered	12	Stupid		Indifferent	5
	Cowardly	5	Fickle	20	Hysterical	4	Aggressive	4		
	Other	● Talkative ● Optimistic ● Easygoing ● Gentle								
	How old are you?									
24	9 years old or younger			10 – 19 years old	16					
	20 – 29 years old	20		30 – 39 years old	3					
	40 – 49 years old	15		50 – 59 years old	6					

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	60 – 69 years old	5	70 – 79 years old	
	80 years old or older			
25	Male	21	Female	45
26	Unmarried	43	Married (with or without children)	21
	Separated	1	Widowed	
27	What type of residence do you live in?			
	Detached house	34	Apartment (wooden building, up to two stories)	6
	Apartment	23		
28	Is there any soundproofing?			
	Yes	13	No	48

The subjects of this survey were musicians, both professional and amateur. We mailed the questionnaires and consent forms to each conservatory, music faculty, and music department together with a document explaining the nature of the research, asking that students and faculty members respond and submit them to us in return envelopes. We sent a total of 1,300 questionnaires to 41 conservatories, music faculties, and music departments in all cities throughout Japan; the number of surveys sent was based on the number of students/musicians at each school. In addition, we included some outpatients from Kawasaki Municipal Tama Hospital. We decided to consider responding to the questionnaire as a formal consent.

The questionnaire itself comprised 28 questions grouped into four main components in Japanese: (1) Symptoms (questions 1-10), (2) Coping Methods and Treatment (questions 11-17), (3) Musical Instruments and Length of Engagement (questions 19-22), and (4) Personal characteristics (questions 23-28). Symptoms included level of pain, movement difficulty, etc. Coping methods included both informal (“taking a break”) and formal (“acupuncture”) methods. This section also inquired as to the subject’s knowledge of dystonia. Length of engagement included the amount of experience (e.g., how many years) playing the instrument(s) the subject identified within the survey, as well as frequency of playing and practicing during that time. Personal characteristics included both self- and external-reported personality traits as well as basic demographic information. The questions were primarily formatted as having multiple choices provided, though several allowed for more open-ended answers (or at least an “other” category for the subject to use).

Data accumulation was entrusted to an external contractor rather than the creators of the questionnaire in order to eliminate bias.

This study was approved and validated by the appropriate committee (No. XXXX).

3. RESULTS AND DISCUSSION

We received responses from 66 of the 1,300 recipients (5%). The questions, respondents’ answers, and the number of respondents answering with a given choice are provided for each of the four main categories (see Methods above) in Tables 1-4, respectively. Briefly, we found that the respondents complained of 67% of the symptoms being in the right hand; the main symptom was pain. Many respondents could also not maintain good embouchure. The majority of respondents did not utilize formal treatment, but instead took “breaks” from playing/practicing. A small number did undergo more formal medical treatment, including among others acupuncture, surgical intervention, and nerve block injections. Thus, the majority of respondents did not have a definitive diagnosis of dystonia. A small number knew what dystonia was, but many did not. Of the instruments cited, the piano was most commonly played. Length of engagement was cited by respondents as averaging 15 years of experience including at least 1 h/day of work. Embouchure was a problem primarily in those respondents playing wind instruments. Of the 66 respondents, 27 described themselves as “professional” or “semi-professional” musicians, and 37 as “student” or “amateur” musicians. Given that more of the questionnaires were sent to students, the rate of response of the student and amateur musicians was distinctly lower than that of the professionals. Finally, the three most-cited character traits of the responding musicians

were “serious”, “patient”, and “kind”. Female affected more than male (music department in Japan, female students are predominantly).

This study found that in the group of survey respondents, the musicians complained primarily of right-hand symptoms that had not been diagnosed as dystonia or any other disorder, and that these musicians, whether amateur or professional, coped with the pain mostly through taking time off from playing rather than seeking medical help.

This study was strong in its thoroughness and recognition of the need to educate musicians on dystonia. In general, the incidence of task-specific dystonia is 1 in 3,400 people in the world [1]. However, in overseas reports, the incidence of musician’s dystonia amongst professional musicians is 1 in 100, making it a very common disease [2]. However, the incidence of musician’s dystonia in Japan has been previously studied inadequately, and our respondents did indeed have very little knowledge of the disorder, especially in relation to their profession or avocation (music). This study attempted to gather information on a range of potential risk factors for musician’s dystonia, as well as potential factors that might indicate in follow-up who will be more likely to develop dystonia, and how it will be expressed if it does develop. Stress induces dystonia, so the personal characteristics are also important[4].

This study was limited by a very low response rate, possibly due to the fact that the questionnaires were sent to department heads and conservatory leaders rather than being sent directly to individual potential respondents. Some packages returned to us. It is possible that the purpose of the questionnaire was not fully communicated to the individuals in charge, and thus it was not passed on to many students or teachers. The lower response rate by amateurs and students supports this possibility. Finally, this study was performed in a survey format; there was no comparative (control) group, and no way to control for selection bias resulting from the relative few who responded to the survey, so formal statistical comparisons could not be performed.

Our response rate was lower than other studies. For example, Tamagawa et al. conducted a survey on occupational dystonia with a questionnaire sent to 294 full-time occupational health physicians working for large companies nationwide, and obtained responses from 145

individuals (49.3%)[5]. This is much higher than our 5% response rate. However, there are no other studies addressing dystonia in Japanese musicians, so little comparison can be made between this study and others [6].

There are cases where dystonia, being a neurological movement disorder, may be hidden due to lack of exercise as well as poor physical condition at the time when it becomes difficult for sufferers to play their musical instruments. Symptoms often occurred in the right hand. In the case of musical instruments that involve movements of the rotator cuff, such as the piano, this may be because the right hand plays delicate melodies. In the case of musical instruments that involve plucking strings, such as the guitar, this may be because the right hand generally plays the strings to produce sound [1].

Conservatories, music faculties, and music departments in Japan are mainly focused on study of classical European music. Vocational schools, which focus on genres such as jazz and rock, and overseas schools (such as the Berklee College of Music) were not included in this survey, so this study may undercount cases of musician’s dystonia; alternatively, the types of dystonia and locations in the body may be more diverse than in this study.

4. CONCLUSION

Education is important, because dystonia can be hidden, and can become severe enough to force premature retirement by musicians. In the future, we hope that those affected by pain when playing will seek medical attention and the appropriate diagnoses and treatments.

At present, there are musicians in Japan who have difficulty playing their instruments and, rather than seek medical attention, are instead “quietly suffering”. Without diagnoses, these musicians cannot be provided with the proper treatment. We conclude that the lack of knowledge of dystonia and its consequences is hindering musicians in Japan, and believe education on this occupational dystonia would improve the health and quality of life of these musicians.

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