



# Drug-Induced Dyskinesia Treated with Korean Medicine: A Case Report

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Drug-induced dyskinesia is an involuntary muscle movement caused by various dopamine receptor-blocking drug exposure, such as antipsychotics, antidepressants, and antiemetics. Causative drug removal is the main treatment for drug-induced dyskinesia whenever possible because its pathophysiology lacks a universally accepted mechanism; however, the symptoms can persist for years or decades in many patients even after causative drug removal. Herein, we present a case of drug-induced dyskinesia in a 61-year-old female patient who consumed medication for approximately 10 years for her depression, anxiety, and insomnia. Cervical and facial dyskinesia was suggested to be related to perphenazine and levosulpiride administration. The patient received acupuncture, pharmacopuncture, herbal medicine, and chuna treatment for 81 days during hospitalization. The symptoms were evaluated using the Abnormal Involuntary Movement Scale, Toronto Western Spasmodic Torticollis Rating Scale, Tsui's score, and Numeric Rating Scale, which revealed remarkable improvement, suggesting the effectiveness of combined Korean medicine for drug-induced dyskinesia.

**Keywords:** Acupuncture; Drug-induced dyskinesia; Korean traditional medicine

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## INTRODUCTION

Dyskinesia is an involuntary muscle movement ranging from slight tremors in the local area to uncontrollable movements of the entire human body. The pathophysiology of dyskinesia lacks a universally accepted mechanism, but it is thought to be caused by chronic dopamine receptor blockade by dopamine receptor-blocking drugs [1,2].

Drug-induced dyskinesia is categorized as acute dyskinesia and tardive dyskinesia (TD) depending on the temporal relationship of causative drug exposure. TD is reported in 20–50% of individuals taking various dopamine receptor-blocking drugs. The main aspect of TD treatment is causative drug removal whenever possible because its pathophysiology is uncertain [2,3].

Herein, we described a patient with cervical and facial dyskinesia who was treated with combined Korean medicine treatment, including acupuncture, pharmacopuncture, chuna, and herbal medicines, and demonstrated improvement in the Abnormal Involuntary Movement Scale (AIMS), Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS), Tsui's score, and Numeric Rating Scale (NRS) scores.

## CASE REPORT

Participant: Female/61-year-old.

Ethical consideration: The medical records of the patient were accessed following approval from the Institutional Review Board of Semyung University Korean Medical Hospital (IRB no.: SMJOH-EX-2022-02).

Chief complaints: Cervical dyskinesia, neck pain, and facial dyskinesia.

Onset date: October 2020.

Family history: None.

Medical history: Uterine cancer (1990); left-hand frac-

ture (1990); depression, anxiety, and insomnia (2011); diabetes (2014); hyperlipidemia (2014).

Treatment duration: From November 9, 2021, to January 28, 2022 (81 days of hospitalization).

Present illness: The patient was diagnosed with depression, anxiety, and insomnia in 1990, and treatment was initiated in 2011. The involuntary movement first occurred on the patient's face in October 2020, and the symptoms gradually expanded and deepened. The patient visited local hospital on October 21, 2021, wherein the brain magnetic resonance imaging detected no lesion. However, perphenazine and levodopa tablets, among the prescribed Western medications (Table 1), were suspected to possibly cause dyskinesia. Thus, the patient immediately discontinued the medications; however, the symptoms did not improve and got worsened, and she was admitted to the Department of Acupuncture of the Jecheon Korean Medicine Hospital for treatment on November 9, 2021.

C-spine radiograph: No definite bony abnormalities in the C-spines (Fig. 1).

**Table 1.** The Western medications

Alpram tablet of 0.25 mg q.d.
Bromazepam tablet at 3 mg q.d.
Zolpicin tablet at 10 mg q.d.
Slivan tablet at 1 mg q.d.
Zolmin tablet at 0.25 mg q.d.
Newpram tablet at 10 mg q.d.
Trazodone HCl tablet at 50 mg q.d.
Mirta tablet at 15 mg q.d.
Perphenazine tablet at 4 mg q.d.
Levodopa tablet q.d.
*Galvusmet tablet at 50/500 mg q.d.
*Lipinon tablet at 20 mg q.d.

The abovementioned Western medications were all discontinued on October 21, 2021, except \*drugs, which were prescribed for diabetes and hyperlipidemia. q.d., quaque die.



**Fig. 1.** C-spine anterior posterior and lateral (November 15, 2021). R, right.

1. Treatments

1) Acupuncture

Sterile disposable 0.25 × 40-mm Dongbang acupuncture needles (Dongbang Medical Co., Ltd.) were used for acupuncture at local acupoints, including GB20, BL10, GB21, GV14, TE16, TE17, ST4, and ST6, and distal acupoints, including GV20, HT7, HT8, and LI4. Acupuncture was performed twice a day for 15 minutes each. Electrical stimulation was maintained at 3 Hz and delivered using an electro-stimulator (Haniil™) at GB20 and GB21 (Table 2).

2) Pharmacopuncture

Pharmacopuncture was performed at the acupoints, GB21, GV14, and TE17, once daily. Soyum pharmaopuncture (AJ medication) was used in the acute phase (from admission to day 40), and Hominis placenta phar-

macopuncture (AJ medication) was used in the recovery phase (from day 41 to discharge).

3) Herbal medicine

The patient was prescribed Dokhwajihwang-tang, Eokgan-sangami, and Jakyakgamcho-tang thrice daily (Table 3).

4) Chuna therapy

Chuna therapy was performed every other day (from admission to day 30) for 10 minutes. The patient underwent supine JS cervical therapy, muscle energy technique, and cervical region stretching [4].

5) Physical therapy

Hot pack treatment and interferential current therapy were applied to the cervical region once daily for 15 minutes.

Table 2. Standard for reporting interventions in clinical trials of acupuncture (STRICTA)

Item	Details
Acupuncture rationale	1a) Acupoints were selected based on traditional Korean medicine meridian theory. 1b) Acupuncture treatment was administered based on the literature and clinical experience of experts. 1c) Needles were removed when the patient complain of too much pain in the treated area.
Details of acupuncture	2a) Each session used 10–20 needles. 2b) GB20, BL10, GB21, GV14, TE16, TE17, ST4, ST6, GV20, HT7, HT8, and LI4. 2c) The depth of inserted needles was between 2.0 cm and 3.0 cm. 2d) Any manipulations were not adopted. 2e) Electrical stimulation was applied at 3 Hz, delivered by an electro-stimulator (Haniil™). 2f) Needles were retained for 15 minutes. 2g) 0.25 × 40 mm sterile disposable Dong-bang acupuncture needles were used (Dongbang Medical Co., Ltd.).
Treatment regimen	3a) The patient received 162 sessions of acupuncture treatment. 3b) Acupuncture treatment was administered twice a day during hospitalization.
Other components of treatment	4a) Pharmacopuncture was performed once daily. Herbal medicine was taken 3 times daily. Chuna therapy was performed every other day from admission day to the 30th day. Physical therapy was applied once daily. 4b) The patient was informed about the diagnosis and treatments.
Practitioner background	5) Korean medicine doctor with 2 years of clinical experience provided treatments.
Control of comparator intervention	6) This case report was not relevant because there was no control group.

Table 3. The composition of herbal medicine

Herbal medicine	Herbal components (g)
Dokhwajihwang-tang (from admission to day 10, from day 25 to discharge)	Nelumbinis Semen 16, Corni Fructus 8, Poria Sclerotium 6, Alismatis Rhizoma 6, Moutan Radicis Cortex 4, Saposhnikoviae radix 4, Araliae Continentalis radix 4
Eokgan-sangami (from day 11 to day 16)	Uncariae Ramulus cum Uncus 8, Angelicae Gigantis radix 6, Bupleuri radix 5, Cnidii Rhizoma 6, Atractylodis Rhizoma Alba 8, Poria Sclerotium 8, Glycyrrhizae radix et Rhizoma 4, Citri Unshius Pericarpium 6, Pinelliae Tuber 4, Vitis Fructus 4, Asiasari radix et Rhizoma 4, Amomi Fructus 6, Longan Arillus 6
Jakyakgamcho-tang (from day 17 to day 24)	Paeoniae radix 16, Glycyrrhizae radix et Rhizoma 8

**Table 4.** Variations in symptoms during treatment

Symptoms	Day 1 (admission day)	Day 21	Day 42	Day 63	Day 81 (discharge day)
Cervical dyskinesia					
Frequency (Hz)	1–2	0.5–1	0.5–1	0.2	0.2
Angle	60° of extension, 30° of side bending, and 60° of rotation	45° of extension, 20° of side bending, and 40° of rotation	40° of extension, 15° of side bending, and 30° of rotation	20° of extension, 0° of side bending, and 15° of rotation	20° of extension, 0° of side bending, and 5° of rotation
Duration in daily life (%)	100	60	50	25	10
Neck pain	4	2	2	1	0
Facial dyskinesia	7	5	3	1	0
AIMS	20	16	11	5	3
TWSTRS	58	44	36	17	8
Tsui's score	15	12	11	5	4

AIMS, Abnormal Involuntary Movement Scale; TWSTRS, Toronto Western Spasmodic Torticollis Rating Scale.

## 2. Evaluation

### 1) Abnormal Involuntary Movement Scale

The AIMS evaluates involuntary movements and includes 12 items, with each score scaled 0–4, wherein higher scores indicate more severe symptoms [5].

### 2) Toronto Western Spasmodic Torticollis Rating Scale

Cervical dyskinesia was observed and evaluated in more detail because it was the most prominent symptom. The TWSTRS was used for the comprehensive evaluation of cervical dystonia [6].

### 3) Tsui's score

Tsui's score was used to evaluate cervical dystonia along with TWSTRS. Tsui's score is a brief and relatively simple rating scale for cervical dystonia [6].

### 4) Numeric Rating Scale

NRS was used to measure the degree of neck pain and facial dyskinesia.

## 3. Progress note

The patient demonstrated continuous involuntary contractile cervical movement in daily life at a frequency of 1–2 Hz on the day of admission. The movement angle was 60° of extension, 30° of side bending, and 60° of rotation, and the patient had difficulty reaching a cervical neutral position and neck pain of NRS 4. Her face demonstrated a continuous involuntary abnormal movement of NRS 7 and excessive eye blinking and oral chewing sounds. The patient had difficulty performing basic daily activities independently.

The symptoms gradually improved during the treatment period (Table 4). Involuntary cervical movement frequency, angle, and duration improved and the patient did not have neck pain during discharge. The patient maintained proper positions during daily activities and performed indoor and outdoor activities. Her symptoms improved, and she decided to receive outpatient treatment after discharge. Side effects were not observed during hospitalization.

AIMS, TWSTRS, Tsui's score, and NRS were used every 3 weeks to evaluate the treatment results during hospitalization. The criteria revealed gradual improvement during the overall treatment period. The patient had a score of 20, 58, and 15 on the AIMS, TWSTRS, and Tsui's scale during admission and 3, 8, and 4 upon discharge, respectively.

## DISCUSSION

Drug-induced dyskinesia is a complex and unique neurologic disorder. Some individuals may partially or completely remit a few years after causative drug discontinuation; however, symptoms may persist for years or decades in many patients, even after causative drug elimination. A study revealed that only 5 of 42 patients with TD (12%) achieved remission after causative drug discontinuation. Additionally, another study reported that only 33% of patients experienced remission 2 years after causative drug discontinuation [1,7].

This case underwent acupuncture to relieve cervical, occipital, temporal, and facial muscle contractions and local acupoint tenderness, including GB20, GB21, BL10,

GV14, TE16, TE17, ST4, and ST6. Distal acupoints, including GV20, LI4, HT7, and HT8, were stimulated to recover qi circulation and relieve the patient's depression and anxiety.

Soyum pharmacopuncture consists of *Lonicerae Flos*, *Forsythiae Fructus*, *Taraxaci Herba*, *Rehmanniae radix*, *Scutellariae radix*, *Coptidis Rhizoma*, *Phellodendri Cortex*, and *Gardeniae Fructus* and was performed to relieve muscle tenderness and pain in the acute phase [8]. *Hominis placenta* is a dried placenta isolated from healthy pregnant women after delivery and is most widely used to replenish vital essence and blood in oriental traditional medicine [9]. *Hominis placenta* pharmacopuncture was performed to replenish and strengthen the weakened cervical muscles in the recovery phase.

The patient underwent chuna therapy to relieve cervical region tension, including the sternocleidomastoid, scalene, levator scapulae, splenius capitis, splenius cervicis, semispinalis cervicis, and trapezius muscles.

The patient, in this case, was diagnosed with Soyangin based on her characteristics and symptoms, and Dokhwajihwang-tang was prescribed. Dokhwajihwang-tang is a prescription presented in Donguisusebowon which is mainly used for Soyangin Yin-deficit-diurnal-heat symptomatology, including stroke, vomiting, and dyspepsia. Various related case studies on brain infarction [10], peripheral facial palsy [11], and digestive disorder [12,13] have been reported. Dokhwajihwang-tang was prescribed in this case for the central neuroadaptive signaling system and to relieve uncontrollable facial and cervical movement disorders and symptoms of indigestion and nausea. Eokgan-sangami was prescribed to relieve the currently worsening anxiety and insomnia. Jakyakgamcho-tang was prescribed to relieve the currently worsening muscle contraction and tenderness.

Herein, the patient with cervical and facial dyskinesia was treated with combined Korean medicine and demonstrated a significant decrease in AIMS, TWSTRS, and Tsui's scores compared to the expected natural progress. Additionally, the patient's subjective awareness of cervical pain and ability to perform daily activities improved, suggesting the effectiveness of combined Korean medicine for drug-induced dyskinesia.

Recently, several case reports have presented drug-induced dyskinesia, including 1 case in which Roh et al. [14] treated risperidone-induced dyskinesia, another case in which Lee et al. [15] treated levosulpiride-induced dyskinesia, and cases in which Choi et al. [16] and Kim et al. [7] treated patients with drug-induced Parkinsonism. Many of the reported cases were related to facial or extremity

dyskinesia or symptoms, such as tremors, bradykinesia, and postural instability, which can be classified as the Parkinsonism category. This study is vital because it supplements cases focusing on cervical or trunk dyskinesia with existing cases of drug-induced dyskinesia.

However, this study has some limitations in describing a single case and applying complex treatments simultaneously. Additionally, some of the symptoms may have spontaneously improved because of the drug washout within the treatment period; therefore, additional clinical cases and control studies are needed to determine the effect of Korean medicine treatment of drug-induced dyskinesia.

## AUTHOR CONTRIBUTIONS

Conceptualization: SMR, NYJ. Formal analysis: SMR. Investigation: SMR. Methodology: SMR. Supervision: JDR. Writing – original draft: SMR. Writing – review & editing: All authors.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

## FUNDING

None.

## ETHICAL STATEMENT

The medical records of the patient were accessed following approval from the Institutional Review Board of Semyung University Korean Medical Hospital (IRB no.: SMJOH-EX-2022-02).

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