

Case report

# Effect of oriental medicine music therapy on idiopathic chronic fatigue: A case study

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Received 3 September 2011; received in revised form 5 December 2011; accepted 8 December 2011

## Abstract

**Introduction:** Chronic fatigue is a “persistent and recurrent fatigue” that lowers an individual’s quality of life. The cause and treatment of idiopathic chronic fatigue (ICF) have not been clearly established. Oriental medicine music therapy (OMMT), which is one of the alternative therapies applied to many chronic diseases, is distinct from conventional music therapies in terms of active participation and being originated from the theory of traditional oriental medicine. Many studies have shown that patients with chronic fatigue are related to hypocortisolism. Based on salivary cortisol concentration, a validated fatigue severity scale (FSS) and visual analog scale (VAS) of overall fatigue, we identified a patient who recovered from ICF with the aid of OMMT.

**Materials and methods:** An outpatient with ICF was treated with OMMT for 40 min (1 session) 3 times a week. The treatment included listening to selected music and playing a musical instrument under the direction of an oriental music therapist. Twelve sessions of treatment were conducted, with salivary cortisol concentration measured before each session. The FSS and VAS were checked each week.

**Results:** After treatment with OMMT, the values of the FSS and VAS were significantly decreased. In contrast, the salivary cortisol concentration increased, which generally could indicate a recovery from chronic fatigue.

**Conclusions:** This case suggests that OMMT may be an alternative treatment for ICF.

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**Keywords:** Chronic fatigue; Oriental medicine; Music therapy; Cortisone

## Introduction

Chronic fatigue (CF), which is mostly defined as “self-reported recurrent and persistent fatigue lasting 6 or more months” [1] is poorly recovered by rest and not associated with exertion as a subjective symptom [2]. The more severe forms of CF involve idiopathic chronic fatigue (ICF) and chronic fatigue syndrome (CFS). ICF/CFS are prevalent all over the world [3] and lead to considerable damage to society by downgrading a person’s quality of life [4]. The aetiology of ICF/CFS is yet medically unexplained. Although various treatments, such as

cognitive behavioral therapy [5] and antidepressants [1], have been used, the response to these treatments is unsatisfactory and definite cures for ICF/CFS have not yet been established.

ICF is CF with fewer than 4 of additional symptoms essential for a diagnosis of CFS, which is characterized as severe fatigue and combination of more than 4 accompanying conditions such as psychological and social factors [6]. Most published studies focus on defining, evaluating and treating patients with CFS rather than ICF [7]. However, two-thirds of patients expressing CF in primary care do not meet standard for CFS [8]. General practitioners have been skeptical to the usefulness of the classification of CFS [9] and shown concern about validity of CFS as a disease [10]. In clinical fields, it is regarded more important to find proper management for ICF than that of CFS.

Recently, many clinical studies in relation to the alternative treatments for CF have been conducted. Oriental medicine music therapy (OMMT) focuses on the equilibrium between the body

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and mind [11]. OMMT is distinct from other types of music therapy in that it uses an active patient participation method and is based on oriental traditional medicine theory. To date, there have been no studies related to the effect of OMMT on fatigue.

Diminished adrenal steroid production is linked with fatigue, which is a major feature of Addison's disease and primary adrenal failure [12]. A number of studies on fatigue-related syndromes, such as CFS, fibromyalgia and post-traumatic stress disorder suggest that these diseases have low level of cortisol concentration [13–15]. There are 2 methods evaluating cortisol concentration; serum and salivary cortisol. Salivary cortisol measurement, a non-stressful method of assessing biologically active hormones, is known to reflect fatigue level more accurately than serum cortisol [16].

This case demonstrates successful use of OMMT in the recovery from ICF by evaluating validated questionnaires and salivary cortisol.

## Materials and methods

The patient, a 38-year-old, married male with persistent fatigue, muscle pain, and insomnia visited our outpatient clinic. To identify the cause of his fatigue, thyroid, liver, and renal functions were checked. However, nothing abnormal was detected. Additional laboratory evaluation was done to check for systemic infection, but the possibility of infection was assessed as none. The fatigue persisted for at least 6 months, could not be relieved by rest and was medically unexplained. Because he had only 2 accompanying symptoms (sleep dysfunction and musculoskeletal pain), he did not meet all of the criteria for CFS and his fatigue could be diagnosed as ICF.

To assess his fatigue, a visual analog scale (VAS) for overall fatigue and a fatigue severity scale (FSS) were used. To measure the VAS, a 100 mm measurement instrument was given to the patient and he was instructed to indicate his severity of fatigue in relation to the 2 extremes (0: no fatigue, 100: very severe fatigue). The FSS includes 9 items rated on a 7-point Likert scale and is sensitive to gradations of fatigue severity [17]. The initial VAS and FSS scores for this patient were 72 and 47, respectively. The 2 scales were filled out once a week for 4 weeks.

The collection of saliva was carried out between 8 and 9 AM (before the meal and OMMT session) when salivary cortisol is not affected by food and overall daily cortisol production is more accurately measured [18]. The patient was asked to refrain from eating or brushing his teeth in order to improve the quality of saliva samples.

The initial value of the salivary cortisol concentration (taken at the second session) was 0.11  $\mu\text{g/dL}$  which is below the normal range of 31–50 aged adult male [19]. Saliva was tested using Salivettes<sup>®</sup> collection tubes, which consisted of cotton swabs inside small plastic tubes kept in the freezer, at  $-70\text{ }^{\circ}\text{C}$ , until the time of analysis. The analysis of salivary cortisol was conducted at Green Cross Reference Laboratory (Youngin, Korea) using an enzyme immunoassay.

OMMT was implemented for 40 min, 3 times a week. The overall therapy consisted of 12 sessions, with each session

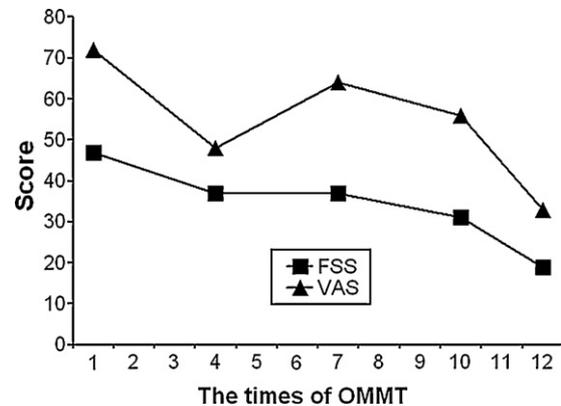


Fig. 1. Serial fatigue severity scale (FSS) and visual analog scale (VAS) of overall fatigue during oriental medicine music therapy (OMMT). The value of Y axis corresponds to the estimated score of VAS or the sum total of FSS.

divided into 5 steps. In the first step, the patient practiced controlling *qi* through respiration to music played by the *Daegeum*, a traditional Korean pipe, for 5 min. This step helped to calm and relax him, so that he could accept the OMMT more comfortably. In the second step, the patient shook maracas and tapped them on his acupoints to the rhythm of individually customized music for 5 min. The following acupoints were used: *Fengshi* (GB31), *Fenglong* (ST40), *Neiguan* (PC6), and *Jianjing* (GB21). The third step was the practice of an oral sound and vocal exercises to the rhythm of the oriental music for 20 min. The patient beat time with his hand while he made high, low, and flat vocal sounds, which helped to relieve his depression and stress. The fourth step consisted of constraint relieving music therapy using the *Sogo*, a traditional Korean snare drum, which the patient played as he tapped the acupoints *Laogong* (PC8) and *Baihui* (GV20) to the rhythm for 5 min. The goal of this step was to promote the circulation of the *qi* and blood. The last step, which lasted 5 min, was the appreciation of selected oriental music to promote a peaceful mind. All treatments were conducted at the Department of Oriental Medicine Music Therapy Center, Kyung Hee University Hospital at Gangdong, Seoul, Republic of Korea.

## Results

After the OMMT, the patient no longer complained of persistent fatigue. As shown in Figs. 1 and 2, the value of the FSS decreased from 47 to 19, while the value of the VAS decreased from 72 to 33. Salivary cortisol concentration increased from 0.11  $\mu\text{g/dL}$  to 0.27  $\mu\text{g/dL}$  which means salivary cortisol was recovered from below to within normal range [19]. Although insomnia persisted, muscle pain disappeared. No notable side effects emerged during or after the OMMT. The patient was free from other treatments known to affect fatigue, such as the intake of drugs or nutritional supplements, diet regulation, and exercise, during the OMMT period.

There were also considerable changes in his lifestyle. Before therapy, he stated, "I could barely lift my head every morning when I woke up . . . when I went to bed, it took a long time to fall asleep . . . in the daytime, I am constantly feeling the desire to sleep. It's just a vicious cycle." After 4 weeks of OMMT, he

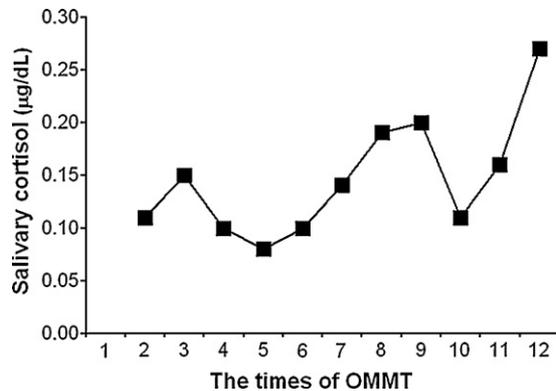


Fig. 2. Serial salivary cortisol concentrations during oriental medicine music therapy (OMMT).

no longer complained of severe fatigue. He said, “I feel much better than I used to . . . my family saw a change in me when I came home. My fatigue was reduced to a level that I was able to deal with . . . the therapy helped a lot.”

## Discussion and conclusions

Based on our data obtained from FSS and salivary cortisol, it is indicated that OMMT can be useful as a complementary therapy in the treatment of ICF.

OMMT is an active form of therapy originating from oriental medicine theory, which incorporates the principles of *Yin*, *Yang*, and *the Five Elements*. Oriental music, used in OMMT, is categorized in accordance with these theories and matches patients in line with these properties [20]. In OMMT, the radiating energy of music is characterized by its melody, rhythm, chords, and timbre [20], and the effect of oriental music is differentiated by these kinds of musical energy. According to previous studies, OMMT prevents various diseases, such as blood cancer [21] and ischemic stroke [11], and promotes health by means of music specially chosen and designed to control the *qi* of the individual [11]. In traditional Chinese medicine, fatigue can represent a disharmony and depletion of *qi*; thus, by managing the circulation of *qi*, fatigue can be improved [22]. However, self-chosen music in OMMT is not acceptable because OMMT should be selected by a traditional oriental medical doctor. The therapeutic music or actions should be altered according to the patient’s condition, thus self-taught OMMT is partially permitted when their symptoms do not change.

The frequency (3 times a week) and period (12 sessions) implemented in this study were empirically confirmed and were based on our clinical experiences for several years. According to our previous studies, OMMT showed its effect on various medical conditions when conducted at least more than twice a week and for more than 10 sessions in common [21,23]. However, it is still difficult to decide how often and how long OMMT should be carried out on ICF. Research to determine the duration and frequency of OMMT on ICF is needed.

On the other hand, previous research on conventional music therapies reported the effects on fatigue-related symptoms. For example, relaxing music had effects on recovery from

exercise-induced fatigue [24] and music therapies using active participation, such as singing, performing and recording the music, have shown the effect on perceived exertion and fatigue [25–27]. Though diverse music therapies turned out to have effect on relieving fatigue, they mainly focused on acute-stage fatigue causing elevation of cortisol level [28] and there have been few studies investigating the effects of conventional music therapies on chronic unexplained fatigue. Moreover, there have been no clinical reports showing the effect of OMMT on ICF.

Cortisol is released in the adrenal medulla, which is activated by the pituitary gland. The hypothalamo-pituitary-adrenal (HPA) axis constitutes a major part in resisting to inflammation and defending against stress [29]. It has been suggested that HPA-axis dysfunction and stress may influence immune system in ways that promote fatigue, or cancer occurrence [30]. In general, stress activates HPA-axis resulting in increased cortisol secretion. However, it is hypothesized that chronic fatigue or stress is associated with diminished activity of HPA-axis leading to hypocortisolism [15]. Several studies have reported reduced diurnal cortisol variation in patients with other fatigue-related symptoms like burnout, and vital exhaustion [31–33]. In this report, a considerable decrease in the FSS and VAS, and a gradual increase in cortisol output after 12 sessions of OMMT has been confirmed. Therefore, there might be an association between OMMT and ICF. Although it cannot be postulated definitively that OMMT is a cure for ICF, it may play a role in alleviating fatigue through normalizing the HPA-axis. Further studies using other objective methods such as a functional magnetic resonance imaging of the brain reflecting the change of HPA-axis are needed.

In this study, there were 2 methodological limitations in terms of FSS and salivary cortisol. FSS reflects only the severity of overall fatigue and does not include subscales to evaluate mental and physical fatigue like the Chalder’s fatigue scale [34]. In the evaluation of salivary cortisol, the first session’s saliva was not requested for analysis because the patient drank a coffee and smoked just before the cortisol measurement, which can elevate the level of salivary cortisol concentration [35,36]. There were also 2 exceptionally low cortisol outputs during the OMMT: a sharp decline at the 5th and 10th sessions, both of which resulted from the overwork of the previous day. Overwork was deemed to cause burnout resulting in temporal drop in cortisol secretion [31]. In addition, the saliva could not be collected at night since the subject was an outpatient. The waking cortisol secretion is low and diurnal cortisol is flattened in patients with fatigue [13,14], thus the measurement of the diurnal change in cortisol concentration might be important. Further studies which evaluate diurnal change of cortisol and other fatigue-related questionnaires are needed.

In conclusion, OMMT may have a potential positive effect on ICF, and we suggest it as an alternative treatment of choice for patients with ICF. Well-designed clinical trials including randomized controlled trials with large number of participants are necessary to assess the exact mechanisms of OMMT and its effect on ICF.

## Financial support

None.

## Conflict of interest

No conflict of interest declared.

## Acknowledgements

All research had done by the authors. The abstract of this study was accepted as poster presentation, at the 2011 International Congress on Complementary Medicine Research, 7–9 May 2011, Chengdu, China.

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