

## A Case Report of Cognitive Behavioural Therapy for a Japanese Female Patient Suffering from Migraine

### 偏頭痛に悩む日本人女性に対する認知行動療法

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#### Abstract

Despite its prevalence, migraine was not regarded as a problematic disease until 2000. This third most common disease in the world is also common in Japan. While effective treatment and interventions are introduced in manuals and guidelines in the West, helpful information to treat migraine targeting Japanese patients is still scarce. Accordingly, this clinical note reports a Japanese female who suffered from long-term migraine. Similar to many Western cases, approaches based on cognitive behavioural therapy were deemed effective in this client's case as well. Empirical evaluation was recommended.

*Keywords:* cognitive behavioural therapy; migraine; comorbid; psychiatric.

#### 摘要

偏頭痛は、その高い有病率にも関わらず 2000 年まで深刻な健康問題とみなされなかったが、国際的にもその疾病負荷の高さが注目を集めている。偏頭痛に対する心理療法や介入は日本国外では数多く紹介されているものの、日本人を対象とした報告は未だ十分ではない。本報告では、慢性化した偏頭痛に対し認知行動療法を提供した事例を紹介する。国外での報告と同様に、セルフモニタリングやリラクゼーションを用いた認知行動療法が奏功し、偏頭痛の症状、生活機能、うつ、不安の改善が見られ、日本での偏頭痛に対する認知行動療法の実施可能性が示唆された。今後はマニュアル化された治療プログラムを用いたランダム化比較試験などのより頑健な方法を用いた検証が求められる。

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#### Introduction

Despite being one of the most common problems in medical settings, migraine was not considered a problematic disease in the 1990s – it was as recently as 2000 that it was recognised as one cause of disability by the Global Burden of Disease Study (Leonardi & Mathers, 2000). The prevalence of

migraine was 14.7 % in a 2013 report, which made it the third most common disease in the world (Steiner, Stovner, & Birbeck, 2013). Nonetheless, the prevalence in Japan was lower than the global prevalence: one-year prevalence was 8.4 % in 1997 (Sakai & Igarashi, 1997), and 7.3% in 1999 (Takeshima et al., 2004). The prevalence of

migraine in every country varies to some degree, however this symptom is the seventh leading cause for disability in the world (Vos et al., 2016).

Migraine is known as a disease comorbid with depression or anxiety problems (Buse, Silberstein, Manack, Papapetropoulos, & Lipton, 2013; Wang, Chen, Fuh, Peres, & Luchetti, 2010). For example, chronic migraine is additionally related to further pain (Buse et al., 2010), and a lower health-related quality of life (Blumenfeld et al., 2011). Moreover, chronic migraine is associated with sociological issues as well, such as lower levels of household income and difficulties with both obtaining and maintaining full-time employment (Buse, Manack, Serrano, Turkel, & Lipton, 2010). Chronic migraine is commonly treated pharmacologically, however many patients are susceptible to medication overuse, leading to reduced effects and additional headaches (Langemark & Olesen, 1984; Tepper, 2012). These findings suggest the need for alternative treatments for patients with chronic migraine.

There have been several nonpharmacological approaches recommended or reported effective for coping with chronic migraine. The National Institute of Health and Care Excellence (NICE) guideline recommends the use of a headache diary, recording the frequency, duration, and severity of headaches to monitor their impact on a patient's life, alongside an effective treatment (e.g., meditation, psychological interventions) (NICE, 2012). Relaxation – a classical yet helpful psychological intervention – has also proven effective for headaches (Blanchard, Andrasik, Ahles, Teders, & O'Keefe, 1980). While these approaches are introduced in many treatment manuals written in the West (Otis, 2009), little has been introduced targeting Japanese patients. To date, there has been only one report about nonpharmacological treatment for chronic migraine in Japan, which was a small pilot study with no psychiatric comorbidity

(Motoya et al., 2014).

Accordingly, the purposes of this case report are to (i) present the case of a patient with chronic migraine comorbid with psychiatric problems, and (ii) discuss the feasibility and acceptability of CBT for migraine in Japanese clinical settings.

## Case Presentation

**Patient information and consent:** Yoko (pseudonym) was a 28-year-old woman. She was single, living with parents and a little sister. Despite migraine, she was able to keep working as a full-time dispatch employee. Informed consent was obtained from her for writing this case report.

**Chief complaint:** Her main complaint was migraine, accompanied by nausea, worry, and anxiety.

**History of present illness:** Yoko had suffered from migraine when she was in primary school. During the entrance exam seasons for high school and university, she was diagnosed with a duodenal ulcer and treated by medicine. When she was 23 years old (a fourth-year university student), her migraine became severe, and over-the-counter medicines did not work for her. Because of the fatigue associated with her conditions, she dropped out from university in May; she then visited a psychosomatic clinic to receive stronger medication (this was six years before her visit to us). She took psychosomatic medication for about seven months, however it did not work, so she was transferred to a university hospital in January (five years before her first visit to us). At this hospital she was diagnosed with a panic disorder to be treated by medicine, and claimed psychological problems as well. About two years later (three years before her first visit to us), she recovered well enough to return to university; however her symptoms worsened gradually, and she

withdrew from university six months later. About a half year later, she recovered again and started to work part-time, five days a week; however her migraine recurred so she left the job (two years before her first visit to us). A year later, when she got another job working two days a week, she began to visit an outpatient clinic specialized for headaches. She stated that she was managing migraine better than before but hoped to receive psychological intervention to reduce her symptoms; Yoko was using 20 mg (4 tablets) of Eletriptan per week, and 0.5 mg of clonazepam per day.

**The flow of treatment:** The flow of treatment is in Figure 1.

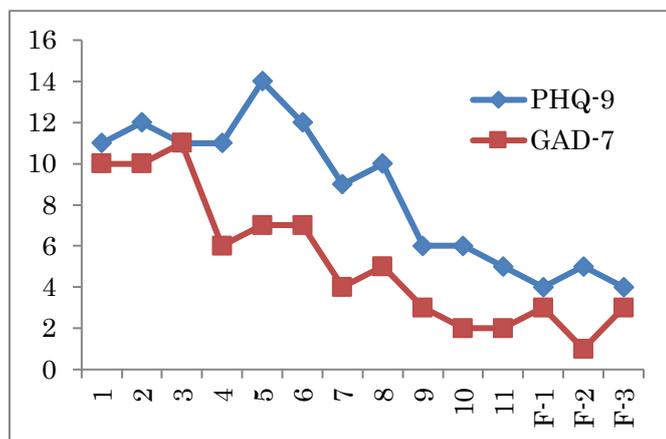


Figure 1. Changes in scores for Patient Health Questionnaire-9 and General Anxiety Disorder-7.

図1：評価指標の変化

**Assessment:** According to the Mini-International Neuropsychiatric Interview (MINI.; Sheehan, 1998), Yoko presented in the intake session with hypomania episodes, agoraphobia, and lifetime panic disorder, also scoring high on the Japanese version of the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire-9 (PHQ-9; Kamijima, & Matsumura, 2011) (i.e., 11 points), and on the Japanese version of the Generalized Anxiety Disorder-7 (GAD-7; Muramatsu, Miyaoka, & Kamijima, 2011) (i.e., 10 points).

**Case formulation:** The medication prescribed by

the migraine specialist substantially eased her symptoms. Yoko was able to work five days a week again, despite her unstable physical conditions derived from migraine. Because of uncertain occurrences of migraine attacks, she was avoiding social activities and worrying about whether she could have a life without migraine. As previously reported in the gate control theory, anxiety and worry can induce additional pain, worsening her migraine. Enhanced pain could in turn induce anxiety and worry about migraine attacks, so these interactions seemed to function as a vicious cycle.

In treatment, the therapist planned to weaken this vicious cycle. First, relaxation was introduced to reduce muscle tension and calm anxiety. Second, as recommended in the guideline (NICE, 2012), a migraine diary was used to identify patterns of her migraine (e.g., ups and downs of pain), helping to elucidate what adds or reduces the pain. This intervention was designed to help her become more aware of relationships between daily life activities and migraine. Third, past experiences of giving up university and her job could be traumatic and threatening to her in daily life, by evoking catastrophic (but unrealistic) images. Therefore, distancing from intrusive thoughts could be a useful skill for her to avoid upset and the vicious cycle.

**Treatment:** After the intake session, ten CBT sessions were held. All sessions took place weekly, and each lasted 50 minutes.

In the intake, or first, session, the therapist asked Yoko to monitor and record the Subjective Units of Disturbance (SUDs) of anxiety, worry, and migraine, and introduced abdominal breathing for relaxation. The purpose of this intervention was to help Yoko to notice the relation between emotion and the strength of migraine, and to train her to relax herself in order to reduce pain.

In the second and third sessions, the therapist interviewed about her life and history of migraine. Yoko stated that she was humiliated when she gave up university and full-time work. She also reported that, because of migraine, she suffered from many associated problems. In-between session homework was assigned, to monitor and record her emotions and migraine.

In the fourth session, the therapist and Yoko discussed a case-formulation of the CBT model when she was upset in the morning (Figure 2).

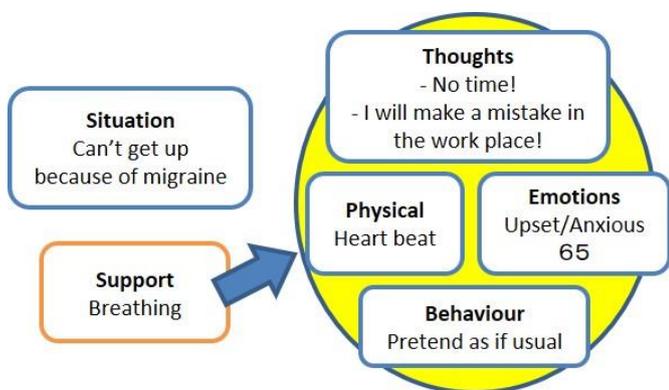


Figure 2. Case formulation of upset in the morning.

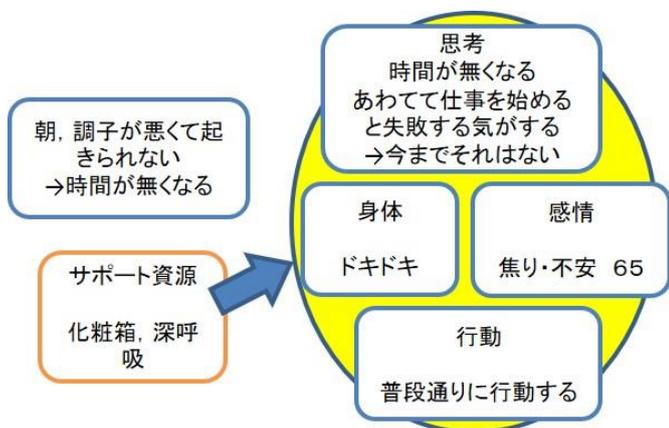


図 2 : 不安のケースフォーミュレーション

Yoko noticed the vicious cycle caused by migraine, which triggered thoughts (e.g., 'I will be late for work' or 'I must not make a mistake because I'm upset') that induced an anxious or physical response. Even though she had never been late for work, such thoughts occurred every day, making her distressed.

In the fifth session, the therapist offered

psychoeducation about worry, and asked Yoko to examine her own worries as homework, using a sheet (Figure 3).

- Realistic ?           ○   ×
- Too future ?         ○   ×
- Can I control?       ○   ×

Are there any reasons you worry about now ?

What can I do anything now ?

If nothing, "let it be!"

Figure 3. Distinguishing worries.

- 現実的か           ○   ×
- 未来の話か         ○   ×
- コントロール可能か   ○   ×

それをいま, 心配する理由はありますか ?

心配に対して, いまできることがありますか ?

なければ, 「ほっとく」こと。

図 3 : あなたの心配事を検討してみよう

In the sixth session, we made a case-formulation about her worry (Figure 4), and introduced psychoeducation about catastrophic interpretation related to worry.

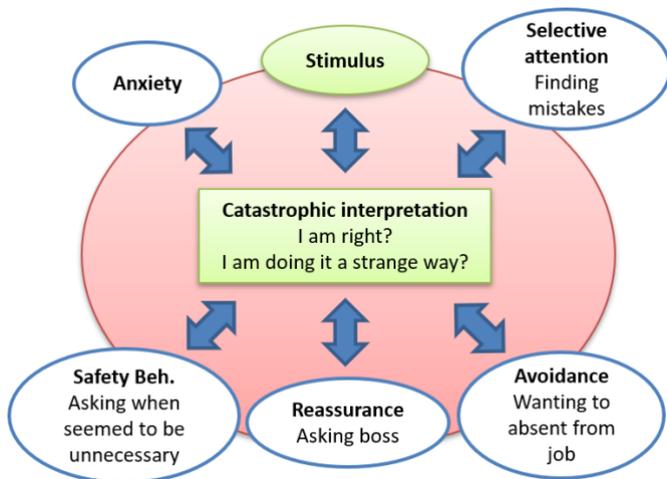


Figure 4. Case formulation of worry.

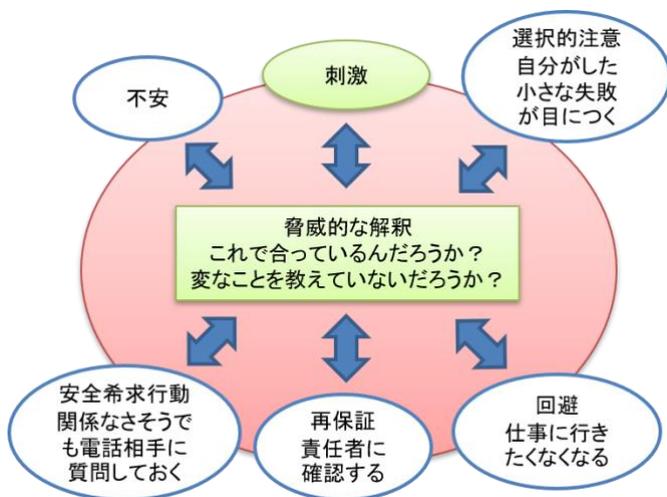


図4：ケースフォーミュレーション

Yoko reported some improvement (e.g. migraine being less severe and frequent), but still felt anxious about getting worse again. Therefore, in the seventh session, the therapist and Yoko focused on her worries about her migraine getting worse and how to cope with it. The therapist pointed out that her worries were an example of catastrophic thought. She agreed to use a sheet to work with her worries (Figure 3) whenever she worried about getting worse again.

In the eighth session, creating a time for her to intentionally experience worries was recommended. Yoko started to set a time for herself to worry in a café before going to work.

In the ninth session, Yoko talked about over-activation, which was similar to hypomania episodes as per MINI. This seemed to be a substitute behavior to make up for any perceived losses she might have encountered by having migraine. When she considered her own condition during severe migraine, she knew that she would not be able to work, study, or enjoy daily life. Therefore, she worked, studied, or enjoyed life too much when she was in better condition. However, through self-monitoring she learned that over-activation leads to exhaustion and migraine. Based on this understanding, she tried to reduce her activities even though she was feeling well.

In the tenth and eleventh sessions, the therapist and Yoko discussed a pace on which she could make adequate progress to avoid over-activation, while enjoying her daily life. This planning included relapse prevention as well.

The follow up sessions took place at 2, 6, and 11 weeks after regular weekly sessions, and focused on recuperation. Yoko reported encountering problems such as overworking, however she was able to manage them to start a full-time job. She also reported that she reduced her usage of Eletriptan from four tablets to one tablet per week.

**Changes on the scores:** Changes of the psychometric scores are presented in Figure 4. Scores on both PHQ-9 and GAD-7 were reduced. The score on the Penn State Worry Questionnaire (PSWQ), administered at the fifth session and the second follow-up session, was also reduced from 66 to 44.

**Discussion**

In this case report, the authors presented the case of a patient with migraine comorbid with psychiatric problems. Because of her history of migraine, Yoko had been continuing medication. To treat this

problem with psychotherapy, the therapist delivered cognitive behavioural therapy, which has shown to be effective in Western countries. As a result, after receiving CBT, Yoko could start a full-time job and showed a reduction in symptoms of depression and anxiety. The dosage of medication was also reduced.

Specifically, a reduction of anxiety was seen in the fourth session (Figure 1). This reduction is assumed to be related to relaxation and self-monitoring. These interventions are thought to be common in treating migraine, as mentioned in introduction (Blanchard et al., 1980; Harris et al., 2015). Relaxation techniques such as deep breathing can reduce muscle tension, negative emotion, and stress, and improve sustained attention (Ma et al., 2017). Self-monitoring helps patients to recognise triggers of their own states (e.g. cognition, emotion, or bodily sensation), and understand the maladaptive cycle (Cohen et al., 2013). These basic techniques seemed to interact and enhance each other. For depression, dealing with worry might in turn reduce depression. Worry caused Yoko to over-activate in order to cope with unrealistic and catastrophic situations, even though she had never experienced them. Avoidance behaviour has been related to depression in previous research (Moulds, Kandris, Starr, & Wong, 2007), and a longitudinal study has also shown that avoidant behaviour can mediate anxiety and depression over a decade later (Jacobson & Newman, 2014). Her worry was thought to derive from the pain of migraine and the difficulties she experienced for a long time, so reconsidering and reducing her worry and avoidance was assumed to reduce her depression.

This case presentation suggests the feasibility and acceptability of CBT for migraine in Japanese clinical settings. The CBT interventions used in Western countries (e.g. self-monitoring, relaxation, and treatment for worry) were shown to be effective in this case, however there are some limitations.

First, feasibility and accessibility are shown through only one case. The authors need to consider a larger sample for more reliable evidence. Of course, effectiveness must be exhibited by conducting randomised controlled trials. Second, the working mechanism in this case report is supported by previous reports, however further studies including both qualitative and quantitative data are needed to clarify treatment procedure.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from the patient for being included in the study.

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