

# Medical support with acupuncture and massage therapies for disaster victims

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## Abstract

**Background:** After the Great East Japan Earthquake and Tsunami Disaster (GEJED) and Joso City Flood (JCF), a number of people were relocated to evacuation centers. In situations following a large-scale disaster, acupuncture can be applied for various health problems in evacuation centers. In this study, we report the medical support operation for evacuees with acupuncture and massage therapy (AP/MT) and its effectiveness. In addition, we propose an experience-based guideline for AP/MT in such situations.

**Methods:** We retrospectively investigated the treatment with AP/MT after GEJED and JCF based on the medical records that were coded. We performed AP/MT for evacuees or supporters in Iwanuma City, Shiogama City, and Natori City after the GEJED (total number of 1042), and in Joso City after the JCF (total number of 110).

**Results:** The most common complaints, shoulder, back, and knee pain, were reported in 67.6% of patients after the GEJED and 80.9% of patients after the JCF. Acupuncture and massage therapy (AP/MT) significantly decreased the median Face Scale score of subjective symptoms in evacuees (before, 3.0 vs after, 1.0,  $P < .001$ ) and supporters (before, 3.0 vs after, 1.0,  $P < .001$ ) in the JCF.

**Conclusions:** Evacuees and supporters in affected areas could benefit from AP/MT for relief of subjective symptoms. For proper management and safety support, we proposed a guideline of AP/MT for postdisaster situations.

## KEYWORDS

acupuncture, disaster, evacuees, massage, supporters

## 1 | INTRODUCTION

In the last decade, numerous disasters including earthquakes, tsunamis, and floods have affected many people in Japan. In the Great East Japan Earthquake and Tsunami Disaster (GEJED) of 2011, at least 18 000 people died or were reported missing and over 400 000 people were evacuated to shelters or evacuation centers.<sup>1</sup> In the Joso City Flood (JCF) of 2015, over 6000 people were evacuated.<sup>2</sup> When large-scale disaster strikes, self-defense forces are deployed for the rescue of affected people, and the disaster medical assistant team (DMAT)

provides supportive medical care in the early phase.<sup>3,4</sup> The DMAT ensures emergency care within 48 hours based on experience gained from the relief efforts of the Great Hanshin Awaji earthquake, because they are trained to treat trauma or crush syndrome caused by the collapse of buildings or houses.<sup>3,4</sup> In the case of larger-scale disasters, restoration takes a longer time, and long-term support is needed. In such situations, the evacuees as well as supporters complain of numerous health problems in the evacuation centers.<sup>5-7</sup> Disaster medical assistant team (DMAT), Japan Medical Assistant Team,<sup>6</sup> and the other teams performed medical support operations with western medical

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treatment; whereas, the Japan Primary Care Association Disaster Relief Project,<sup>8</sup> Disaster Acupuncture, Moxibustion and Massage Relief Project<sup>9</sup>, and Association of Medical Doctors of Asia<sup>10</sup> treated patients using acupuncture with western-style medical care teams. Acupuncturists participated in the teams, and acupuncture and massage therapy (AP/MT) were used as support in the situation following the GEJED and JCF.

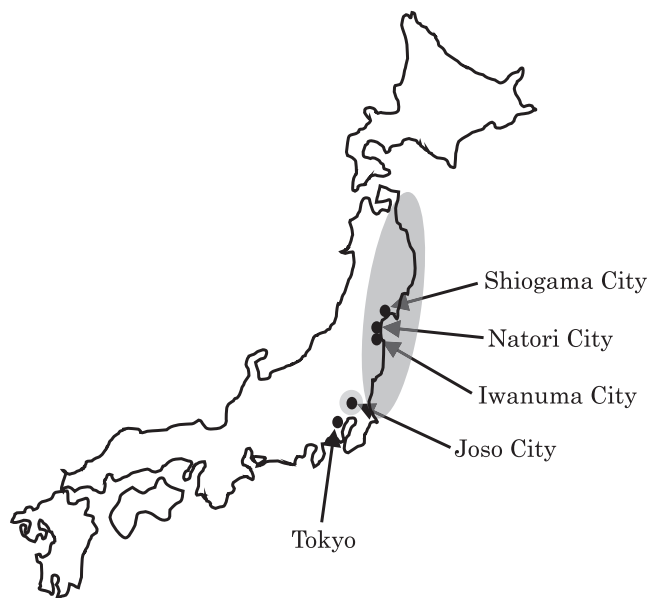
Acupuncture and related techniques have been administered in many conditions, including muscle pain, headache, and insomnia, worldwide. A Cochrane Database Systematic Review showed some evidence for the effectiveness of acupuncture or massage for the treatment of low back pain, shoulder pain, fibromyalgia, and the prevention of tension-type headache.<sup>11-15</sup> In the clinical practice guidelines for chronic headache, low back pain, and fibromyalgia, acupuncture is recommended as a modality for treatment in Japan.<sup>16-18</sup> The evacuees and supporters complained of some symptoms that could be treated with acupuncture. Therefore, in this study, we investigated the symptoms and the effects of AP/MT on the relief of symptoms based on our medical support operation.

## 2 | MATERIALS AND METHODS

We retrospectively investigated the symptoms and the treatment with AP/MT in Iwanuma, Shiogama, and Natori Cities (from 27.3.2011 to 12.5.2011) after GEJED and in Joso City (from 19.9.2015 to 23.10.2015) after JCF based on the medical records. The medical records were kept securely in the storage with the key in the possession of Masataka Miwa, who is a leader of the Disaster Acupuncture and Massage Project. The data were coded completely and sent to Shin Takayama with the personal information concealed. The data management and acquisition of the informed consent were in accordance with the Ethical Guidelines for Medical and Health Research Involving Human Subjects. Subsequently, we displayed the study information on the Disaster Acupuncture and Massage Project home page, according to the guidelines. The characteristics of the evacuation centers where the evacuees and supporters received acupuncture or massage therapy were collected from the data. The support locations in the aftermath of the disaster are shown in Figure 1. The Face Scale score which corresponded to numeric values from 0 to 5 was assessed. The Face Scale score comparisons before and after AP/MT were performed with Wilcoxon signed-rank test using SPSS software. In statistical analyses,  $P < .05$  was defined as significant. As the Face Scale scores before and after AP/MT were obtained for JCF alone, we could analyze and show that data alone. These study procedures were approved by the Institutional Review Board of Tohoku University School of Medicine (No. 2016-1-501).

## 3 | RESULTS

The symptoms and treatment with AP/MT in Iwanuma, Shiogama, and Natori Cities after GEJED and in Joso City after JCF are shown in



**FIGURE 1** Support locations in the aftermath of the disaster

Table 1. A scene of the treatment with AP/MT is shown in Figure 2. After the GEJED, 1042 evacuees and supporters received AP/MT. After the JCF, 110 evacuees and supporters received AP/MT. Most individuals complained of multiple symptoms. The most common complaints were shoulder, back, and knee pain, reported by 67.6% of patients after the GEJED and 80.9% of patients after the JCF. Other symptoms included insomnia, cough, constipation, anorexia, vertigo, and cold sensation in the extremities. Comparison of the median Face Scale scores before and after the treatment indicated that the median Face Scale scores were significantly decreased by acupuncture in evacuees (before, 3.0 vs after, 1.0,  $P < .001$ ) (Figure 3A) and supporters (before, 3.0 vs after, 1.0,  $P < .001$ ) after the JCF (Figure 3B). Some adverse effects, such as slight internal bleeding and muscle pain caused in reaction to excess massaging, were related with AP/MT; however, the adverse effects were relieved on follow-up.

## 4 | DISCUSSION

The present result indicated that AP/MT is helpful for the relief of subjective symptoms. In Japan, disaster could occur again in the future; hence, disaster-preparedness is necessary. In this report, after the early-phase intervention by self-defense forces and DMAT, numerous health problems, especially pain-related symptoms, increased on long-term stay in the evacuation centers. Takayama et al reported that similar pain symptoms increased in the evacuation centers in Ishinomaki City, wherein, serious damage by a tsunami occurred after the GEJED, and many evacuees received AP/MT.<sup>5-7</sup> Pain symptoms often occur and worsen based on not only the disease but also the patients' psychological background. The number of patients who complained of pain affecting various parts of the body increased possibly due to the unaccustomed stay at an evacuation center, as well as lying down in a space that was too small to roll over, contents of meals,

**TABLE 1** Characteristics of the evacuation centers wherein evacuees and supporters received acupuncture or massage therapy. Some data were missing from the medical records, because the information was obtained in the aftermath of the disaster

Disaster	Location	Number of evacuees (n)	Number of supporters (n)	Age (mean and SD)	Gender (male, female)	Pain symptoms including shoulder pain, back pain, lumbago, and knee pain (n)
Great East Japan earthquake and tsunami disaster	Iwanuma city	272	131	53.3 ± 18.6	213, 167	260
	Shiogama city	143	163	73.4 ± 17.4	163, 133	177
	Natori city	113	220	47.5 ± 14.5	210, 88	267
Joso-city-flood	Joso city	65	45	45.5 ± 17.5	65, 44	89

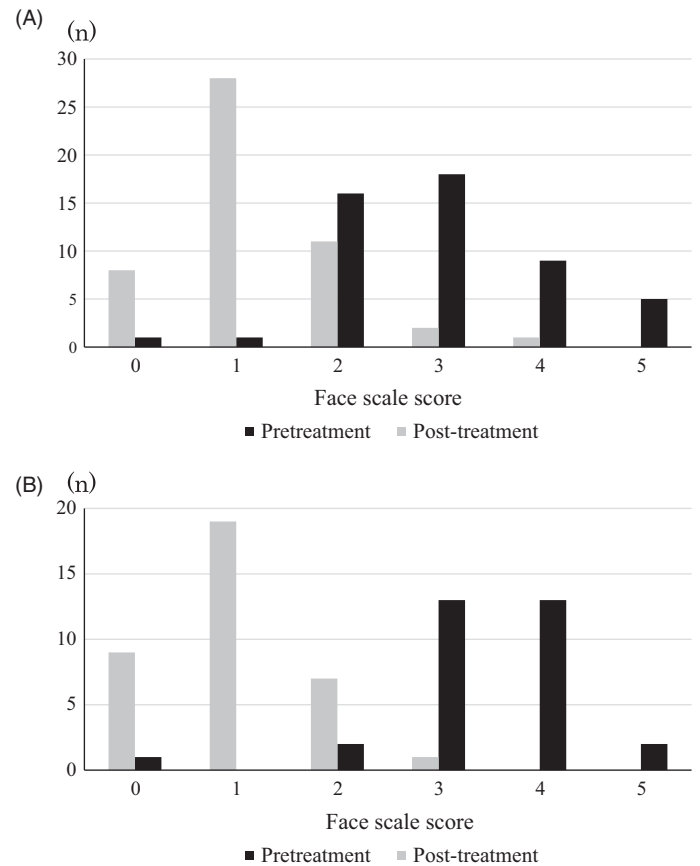


**FIGURE 2** Scene of the treatment with acupuncture and massage therapy (AP/MT) in the evacuation center

environmental problems, psychological shock, stress, etc. In addition to relief of pain and stiffness, AP/MT can contribute to early detection of other problems because long therapy sessions allow practitioners to listen attentively to the evacuees.

Based on our experience with medical support using AP/MT, a guideline of AP/MT in the situation following a large-scale disaster is needed for the proper management and safety support. Acupuncture and related treatment are reported to have some adverse effects that need to be considered.<sup>19</sup> A guideline has been developed within teams of the Disaster Acupuncture, Moxibustion and Massage Relief Project (Table 2).<sup>9</sup> The guideline reflects the feedback of our experience, and it has been revised to manage every possible situation that could arise in case of an adverse event. The revised guideline would be helpful for medical support operations in future large-scale disasters.

In America, Europe, and East Asian countries other than Japan, education and application of acupuncture were introduced to clinical treatment in the hospital setting.<sup>20-24</sup> However, in Japan, acupuncture is mainly performed by acupuncturists who have a national license in private clinics, not in hospitals. Furthermore, the education of acupuncture is limited to about 41.7% medical colleges or universities in Japan.<sup>25</sup> Therefore, doctors still do not fully understand acupuncture. However, in rural communities, many people commonly receive acupuncture. Japan has over 90 000 acupuncturists,<sup>26</sup> which is a precious



**FIGURE 3** (A) Changes in the Face Scale scores of evacuees who received acupuncture or massage therapy in the Joso City Flood evacuation centers. The median (interquartile range values) Face Scale scores were significantly decreased after the treatment compared with before the treatment ( $n = 50$ , median before 3.0 (2.0-4.0) vs after 1.0 (1.0-2.0);  $P < .001$ ). (B) Changes in the Face Scale scores of supporters who received acupuncture or massage therapy in the Joso City Flood evacuation centers. The median (interquartile range values) Face Scale scores were significantly decreased after the treatment compared with before the treatment ( $n = 34$ , median before 3.0 (3.0-4.0) vs after 1.0 (0.75-1.25);  $P < .001$ )

medical resource that should have an active role in many situations including disaster.

Our study has several limitations. Some data were missing from the medical records, because the information was obtained in the aftermath of the disaster. Furthermore, the effect of AP/MT was

**TABLE 2** Index of the guideline of medical support with acupuncture in the Disaster Acupuncture and Massage Project (25 Apr-16)

<b>Process of volunteers</b>
Administration of volunteer organization, volunteer insurance, and volunteer center in regions
Contact with person in charge of regions
Confirmation of the data on activities
The occasions of medical treatment
Confirmation of the patient, history-taking of the symptoms and drugs, examination of vital sign, evaluation and diagnosis, planning a treatment strategy, and writing medical records
Cleaning up
<b>References to the volunteer activities</b>
Cooperation between the acupuncturists and massage therapists
Acupuncturists with low vision
Consideration of therapists in the regions
<b>Medical cooperation</b>
Doctors, nurses, pharmacists, public health nurses, and several support teams; Disaster medical assistance team, Japan medical association team, and mental support teams
<b>Material and equipment</b>
Name cards and white robe
Medical records and data sheets
Sphygmomanometer and thermometer
Acupuncture needle, sterilization, and disposal box
<b>Non-indication of acupuncture and/or massage treatment in the situation after the disaster</b>
Case introduced to doctors
Sudden onset and uncontrolled chest pain, headache, paralysis, high fever, abdominal pain, viscous sputum, cough with blood, remarkable deviation of vital sign, decreased urine, heavy psychiatric symptom, unilateral leg edema suspected with deep vein thrombosis, etc.
<b>Non-indication of massage for edema</b>
Lower limb edema with laterality, edema with inflammation, edema with dyspnea, edema with decreased urine, sudden onset edema
<b>Mental support care in the evacuation centers</b>
Consideration for the experience of disaster, not hearing the detail
Conversation of daily activities after the treatment
<b>Mental health care for the therapists themselves</b>
Sharing of the experience with colleagues after the treatment in affected areas
Consultation with clinical psychologists, in case of repeated irritation, palpitation, or flashback
<b>Incident manual</b>
Prevention of an accident
Report of an accident
Example of the cases of accident
Forgetting to remove a needle
Internal hemorrhage

(Continues)

**TABLE 2** (Continued)

Vagal reflex
Lacking explanation for press-tack needle
Lacking information about post-reaction with massage therapy
<b>Question and Answer</b>
About vital sign
About report
About medical record
<b>Example of medical records</b>
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evaluated using only the Face Scale score, which evaluated the changes in subjective symptoms alone. Face Scale scores were obtained for all symptoms; therefore, pain-related symptoms could not be considered in isolation. These changes might include placebo effects. Moreover, evaluation during long-term follow-up was not conducted.

In conclusion, AP/MT is helpful for evacuees and supporters in disaster-affected areas as they provide relief from subjective symptoms that may arise due to prolonged stay at evacuation centers.

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## CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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