Introduction of a Physician-Staffed Helicopter Emergency Medical Service in Eastern Shizuoka Prefecture in Japan

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Abstract

Objective: To analyze the operating situation of a physician-staffed helicopter emergency medical service in eastern Shizuoka prefecture.

Methods: A retrospective analysis was performed using the conveyance records reported by staff members of the physician-staffed helicopter. A comparison between 2007 (n = 619) and 2012 (n = 678) was performed.

Results: There were no significant differences between the 2 groups with regard to the sex, ratio of cardiopulmonary arrest, and survival ratio. In contrast, the duration from the request of dispatch to arrival at the hospital in 2007 was significantly longer than that in 2012 (53.7 vs 48.2 minutes, $P < 0.0001$). The average age in 2007 was significantly younger than in 2012 (55.7 vs 59.4 years, $P < 0.01$). The ratio of trauma case in the 2012 was higher than that in 2007 (47 vs 37%, $P < 0.001$). The ratio of severe cases in 2007 was higher than in 2012 (45 vs 39%, $P < 0.05$).

Conclusion: Japan is an aging society. In eastern Shizuoka prefecture, the increase in the number of trauma and minor injury cases may have increased due to the emphasis on the importance of early medical intervention by the fire department.

Introduction

To enable an earlier commencement of treatment, helicopters and other aircraft are used to carry doctors to the sites of emergencies in many countries. After the occurrence of many preventable disaster-related deaths during the acute phase of the Great Hanshin/Awaji earthquake in 1995, the Ministry of Health, Labour and Welfare decided to try to establish a physician-staffed helicopter emergency medical service (HEMS) in 1999, which had not previously existed in Japan. The results of the trial in 2 prefectures (Okayama and Kanagawa) showed the efficacy of the HEMS,[1] so the Ministry of Health, Labour and Welfare continued to promote the HEMS and the Japanese cabinet enacted a law to establish an HEMS in Japan in 2007. By February 2013, 40 helicopters had been deployed in 34 prefectures across Japan. The crews of physician-staffed helicopters generally consist of 1 pilot, 1 mechanic, 1 doctor, and 1 nurse.

Several problems associated with the HEMS in Japan have been pointed out, such as the training system, shortage of heliports, and limitations of the service time.[2,3] The indications for air evacuation in Japan are decided upon the receipt of the 119 (emergency) call based on the judgment of the emergency medical technician when he or she receives the dispatch request or is put in contact with the patient(s). When a physician-staffed helicopter is dispatched to a scene, the helicopter lands at a rendezvous point where permission for use has been granted in advance, and the patient(s) is transported there by an ambulance. In some cases, when the physician-staffed helicopter lands before the ambulance arrives, the physician and nurse are transported to the scene by another ambulance. After being examined by the physician, the patient undergoes emergency treatments and triage for transportation to the right hospital. An analysis of the HEMS in Japan revealed an increased survival rate among severe cases, and the cost-effectiveness of the program was also noted.[4-6]

The HEMS service in the western part of Shizuoka Prefecture commenced in 2001 and has been supported by Seirei Mikatahara General Hospital. In March 2004, service in the eastern part of the prefecture was added. Two helicopters cover all of Shizuoka Prefecture, with an arrival time within 20 minutes. Our hospital (Juntendo University Shizuoka Hospital) serves as the base hospital and is responsible for the eastern region of Shizuoka Prefecture, including the Izu Peninsula. This region, approximately 4,090 km^2 in area, with a population of approximately 2 million, is mountainous, with only a few hospitals.[7] The journey from the southern tip of the peninsula to the critical care medical center of our hospital takes 1.5 hours by

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Figure 1. Distribution of Dispatch

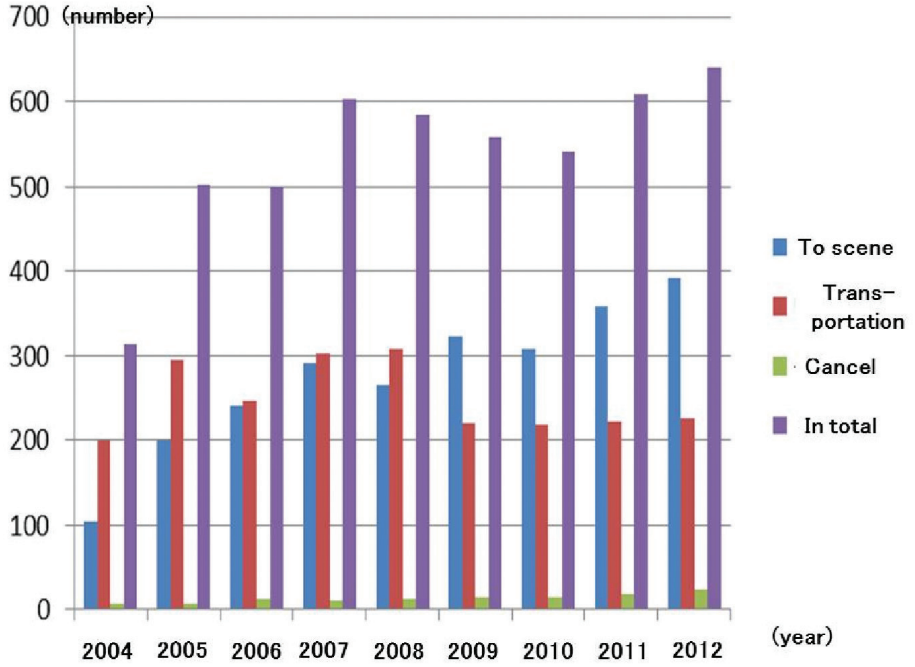

Table 1. The Results of the Analysis Comparing 2007 and 2012

	2007 (n = 619)	2012 (n = 678)	*P* Value
Age (years)	55.7 + 1.0	59.4 + 0.9	<.01
Ratio of males (%)	66	64	NS
Ratio of intrinsic diseases (%)	63	53	<.001
Ratio of extrinsic diseases (%)	37	47	
Ratio of severe cases (%)	45	39	<.05
Ratio of cardiopulmonary arrest (%)	6	8	NS
Time from request to hospital arrival (min)	53.7 + 0.6	48.2 + 0.6	<.0001
Ratio of destinations (to our hospital) (%)	75	75	NS
Survival ratio (%)	85 (n = 444)	86 (n = 504)	NS

NS = not significant.

ambulance but only 15 minutes by helicopter. Currently, only the most severe cases are transported using this HEMS. We herein introduce the results of our analysis of the operating situation of the HEMS in the eastern part of Shizuoka Prefecture.

Methods

A retrospective analysis was performed using the conveyance records reported by staff members of the physician-staffed helicopter. To analyze the operating situation of the HEMS in eastern Shizuoka Prefecture, a comparison between 2007 and 2012 was performed concerning factors such as the sex and age of patients, destination (to our hospital or others), ratio of intrinsic diseases, ratio of extrinsic diseases, cardiopulmonary arrest, severity, duration from the request of the dispatch of the HEMS, and survival ratio among the patients who were transported to our hospital. The definition of severity was the level of abnormality of the vital signs (systolic blood pressure < 90 mm Hg, heart rate > 100 beats per minute, respiratory rate > 30 breaths per minute, SpO_2 $< 90\%$ under room air, or consciousness disturbance at the scene), the anatomic severity in trauma cases, or based on the impression of the physicians.

Statistical analysis was performed using the Student unpaired *t*-test and the chi-square test. Differences with values of $P < .05$ were considered to be statistically significant.

Results

The number of patients who were transported by the HEMS in eastern Shizuoka Prefecture increased from its start in 2004