

【 Incident report 】

Merits and demerit of a webinar on decompression illness in Izu Peninsula in Japan

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【abstract】

Purpose: We held our first webinar on decompression illness (DCI) in Izu Peninsula, and investigated the merits and demerits of the webinar-style meeting.

Methods: There were 247 participants (Fire Department staff, n=180; diving shops staff, including instructors, n=55; Doctor Helicopter staff, n=9 and medical physicians of hospitals outside of Izu Peninsula, n=3). The number of participants was the greatest among the previous meetings. This was the first time for medical physicians who had treated patients with DCI using hyperbaric oxygen therapy (HBO), or patients with DCI who were transported by helicopter and underwent HBO, to attend and present their experiences at the meeting. At 1 month after the meeting, we conducted an anonymous questionnaire survey on the webinar. We selected a narrative method to show the results of the questionnaire.

Results: The questionnaire response rate was 59/247 (23.8%). All participants were satisfied with the meeting. Ninety percent of the participants indicated that they would prefer a webinar-style meeting for their next meeting. Some participants selected a face-to-face meeting style because 1) image and sound were unstable due to Internet trouble; 2) they considered that meeting and talking with a person directly was important to develop a good personal relationship.

Conclusion: The webinar was thought to be a feasible method for maintaining professional knowledge on how to treat patients with DCI among a large number of participants with various occupations during a pandemic. Some technical improvements, including a hybrid-style meeting are required; however, this new style of meeting can be fruitful.

keywords

webinar; decompression illness; questionnaire

【事例報告】

伊豆半島における減圧症に関する WEB 会議の利点と欠点

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【要約】

【目的】 WEB 会議システムを用いて減圧症管理に関する合同会議を開催した。その内容報告と、同会議の有用性や欠点に関して調査をすること。

【方法】 WEB システムを用いた合同会議に 247 名が参加した。その内訳は消防 180 名、ダイビング関

係者 55 名, フライトスタッフ 9 名, 他病院の医師 3 名であった。合同会議参加者数は過去最大数となった。本合同会議に初めて, 高気圧酸素治療装置による治療実施者側の医療者も参加し, 治療内容が紹介された。1 カ月後に同会議に関するアンケート調査を行った。

【結果】 会議後アンケート調査の回収率は 24% であった。会議は満足とするものが 100% に達した。次回の会議方法も 90% が WEB 会議方法を望んだ。一方, インターネット通信障害の問題や, 対面式で開催をすることで顔の見える関係を築きたいとの意見も存在した。

【結語】 WEB 会議システムを用いての減圧症管理に関する知見の交換は, コロナ禍においても容易で多職種の多くの者が参加しやすく, 有用であった。改善点としては, インターネット通信技術の問題や, 対面式会議も取り入れたハイブリッド方式が挙げられた。

キーワード WEB 会議; 減圧症; アンケート調査

1. Introduction

The Izu Peninsula, which is a popular location for recreational scuba diving, is located near Tokyo. Accordingly, a significant number of diving accidents occur there.¹⁾ Since January 2011, our hospital, which is a leader of the Izu Peninsula Medical Control Council (MCC) system, has a physician-staffed helicopter emergency medical service (HEMS), has the only monoplace chamber for hyperbaric oxygen (HBO) therapy, provides appropriate transport for recompression treatment with HBO therapy, and began to hold meetings concerning the management of patients with decompression illness (DCI) to establish a cooperative medical system for such patients in the Izu Peninsula.²⁾ Representatives from the Fire Department, Coast Guard, HEMS, and professional divers belonging to local dive shops in the Izu Peninsula joined the meeting. At this meeting, we hold lectures concerning new topics related to DCI, review the at-the-scene management of patients with DCI using videos, discuss how to recognize DCI, share information on the diving profile using a diving accident checklist, and review the proper, prompt management of patients with DCI, including early transportation through face-to-face conversation.²⁾ However, since the COVID-19 pandemic started in 2019, the Japanese government has recommended that people wear masks, disinfect their hands with alcohol frequently, stay 2 m from others, and avoid going out unnecessarily, as well as three Cs, namely, 'closed spaces with poor ventilation',

'crowded spaces with many people', and 'close contact', which one would experience in intimate conversation, loud cheering, or exercise within close proximity to other individuals.³⁾ Based on the recommendations, the meeting on DCI in Izu Peninsula stopped for 3 years. Since the start of the COVID-19 pandemic, web education, conferences, research, and treatment have developed, and web-based communication has become popular for preventing the three Cs.⁴⁾⁻⁷⁾ However, web conferences (webinar) have not been well evaluated in the medical literature.⁴⁾ We recently held a webinar on DCI in the Izu Peninsula and conducted a questionnaire survey about the webinar. Based on our experience, we report the merits and demerits of the webinar.

2. Methods

The protocol of this retrospective study was approved by our institutional review board, and the examinations were conducted according to the standards of good clinical practice and the Declaration of Helsinki.

On February 28, 2022, we held a webinar meeting concerning how to manage patients with DCI (**Figure 1**). Zoom^R (Zoom Video Communications, San Jose, CA, USA) was used as a webinar software program. Privacy and security were protected by encrypted data using the 256-bit Advanced Encryption Standard.

The contents of the webinar consisted of a presentation in Japanese concerning recent consensus of prehospital management of decompression illness⁸⁾, a review of how to use the diving accident checklist

including a recent case of DCI that was transported by HEMS based on the use of the diving accident checklist⁹⁾, discussion of techniques for the treatment of patients with DCI in the prehospital setting, and a report from a patient who was a diving instructor, experienced DCI, and was transported by HEMS.

Two hundred forty-seven participants attended the webinar, and the number was 247 (Fire Department staff, n=180; diving shop staff, including instructors, n=55; HEMS staff, n=9; and medical physicians of hospitals outside of Izu Peninsula, n=3). This represented the greatest number of participants at such meetings because the maximum capacity of the meeting room in our hospital for face-to-face meetings is approximately 100. In addition, this was the first time medical physicians outside of the Izu Peninsula had treated patients with DCI using a multiplace HBO chamber to attend the meeting. They reported their experience in HBO for patients with DCI and emphasized the importance of using the diving accident checklist to estimate the nitrogen load for providing appropriate HBO therapy. Furthermore, this was the first time that a presentation was given by a patient who had developed DCI (a diving instructor) and been transported by HEMS for HBO. He presented how he felt during transportation and expressed his

gratitude for the medical cooperative system used for the management of DCI in the Izu Peninsula¹. He lived outside of Izu Peninsula at the time of the meeting, but he could attend the meeting using the webinar software program.

At 1 month after the meeting, we conducted an anonymous questionnaire survey about the webinar. The contents of the questionnaire were as follows: 1) occupation; 2) satisfaction with the meeting in general; 3) reason for choice in question 2); 4) satisfaction regarding discussion of case(s); 5) reason for choice in question 4); 6) satisfaction with the webinar style; 7) reason for choice concerning question 6); 8) preferred style for next meeting; 9) diving accident checklist, 10) other comments. Questions 2, 4 and 6 were answered using a 5-grade evaluation (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). Questions 3, 5, and 7-10 were open-ended questions. We selected a narrative method to show the contents of the meeting, the numbers and occupations of the participants, and the results of the questionnaire.

3. Results

The questionnaire response rate was 59/247 (23.8%). The distribution of Questions 2, 4 and 6 is shown in **Figure 2**. All participants were satisfied with the meeting.

One remarkable free description response to question 2 (**Figure 2-1**, concerning satisfaction with the meeting in general) highlighted the importance of having listened to the opinions of the persons concerned, deepening mutual understanding of DCI among the persons concerned, recognizing once again the importance of the diving accident checklist, and brushing up on the latest knowledge concerning DCI, as being aware of DCI numbers is not generally considered important for emergency medical technicians.

Another impressive free description response to question 4 (**Figure 2-2**, satisfaction regarding



Figure 1 Image of the webinar

Participants who had various occupations and even those who lived outside Izu Peninsula could attend the meeting.

discussion of case[s]) concerned the impact of hearing direct opinions from an actual patient with DCI who was transported by the HEMS in Izu peninsula and learned about hyperbaric oxygen therapy and the

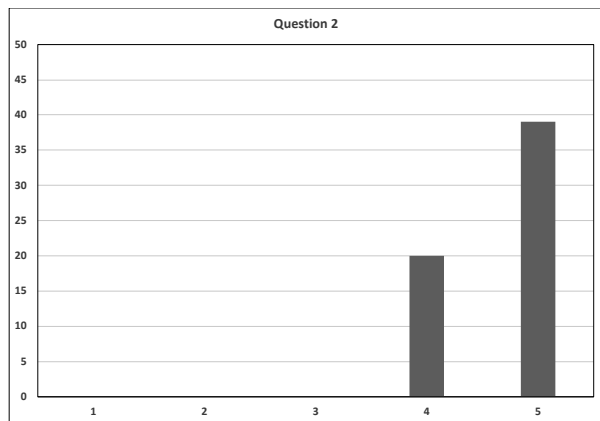
importance of the diving accident checklist from his attending physicians. Twenty-five of 59 (42.3%) participants answered in the free description columns that the presentation from the actual patient was impressive.

There were positive and negative remarkable free description responses to question 6 (Figure 2-3, satisfaction with the webinar style). The positive responses included being able to easily attend the meeting, even while at home or on duty, and thereby being in a suitable situation to prevent COVID-19 transmission because of the lack of crowded spaces. The reasons for selecting a face-to-face meeting style instead of a webinar were as follows: image and sound were unstable due to internet trouble, and the attendee considered that meeting and talking with someone directly is important for developing a good personal relationship with other people.

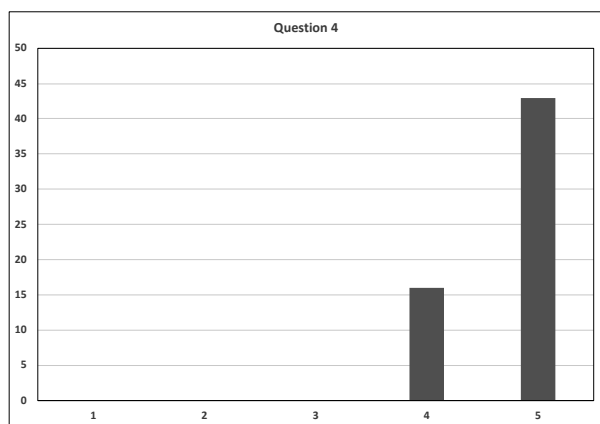
Concerning the preferred style of the next meeting, 53/59 (90.0%) preferred a webinar, 4/59 (6.7%) preferred a hybrid-style meeting (combination of web and face-to-face), and 2/59 (3.3%) preferred a face-to-face meeting.

Concerning the free description responses about the diving accident checklist, some emergency medical technicians tried to fill out the checklist before arrival at the scene via telephone communication. However, one emergency medical technician commented that it was difficult to fill out both official transportation records on the patient and the checklist at the same time on the spot.

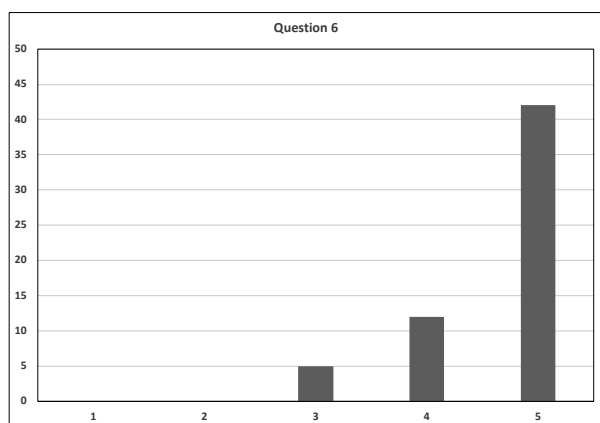
Concerning other free description responses, 22 (44.8%) of the 59 participants gave their thoughts in the free description column. Among them, 19 simply expressed their appreciation for holding the webinar on DCI. However, some attendees suggested the additional inclusion of police or rescue personnel in the webinar, as they were also persons concerned with such situations.



5-grade evaluation (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent)



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Figure 2 The distribution of Questions 2 (Figure 2-1), 4 (Figure 2-2) and 6 (Figure 2-3)

All participants were satisfied with the meeting.

4. Discussion

This is the first report on a webinar concerning the treatment of patients with DCI in the Izu Peninsula. One merit of the webinar was that the number of participants increased, and participants who lived far from our hospital could attend the meeting without incurring costs. The participants could exchange opinions about DCI among different occupations, learn recent knowledge on DCI, and might deepen the mutual understanding of how to treat patients with DCI in the prehospital setting. In addition, the participants could re-recognize the importance of the diving accident checklist. As a result, most of the participants indicated that they would prefer a webinar for the next meeting. Previous reports also showed that webinars provided reduced travel time and costs, convenience, environmental benefits, and comfort for presenters and that it was easier to attend and to ask questions in comparison to face-to-face conferences.^{4),10)-15)} The webinar also means that the size of the audience that is able to attend is unlimited, since it is online, and it can be recorded so that other people can view it if they are unable to attend the webinar. As a result, our attendees expressed their overall satisfaction, similar to a previous report.¹²⁾

One demerit of the webinar style was insufficient images and sound due to internet communication trouble. A previous report described similar trouble.¹⁶⁾ To overcome this, functional improvement of computers, internet, and software programs is required in the future. In the present study, some participants reported that they felt difficulty in developing good personal relationships with other people in this style of meeting. Evaluating the development of a good personal relationship is a difficult problem. However, this may be improved by platforms that ensure effective interaction among participants, such as the “breakout room” feature and “poster hall” communications method for online meetings, or by adopting a hybrid style of meeting.¹⁰⁾

The present study was associated with some limitations, including the low questionnaire collection rate. In addition, we could not evaluate the actual effects at the scene that webinar attendance has when participants encounter patients with DCI. Furthermore, future studies should evaluate the long-term benefits of webinar-style meetings.

5. Conclusion

The webinar was thought to be a feasible method for maintaining professional knowledge on how to treat patients with DCI among a large number of participants with different occupations in a wide area during a pandemic. Some technical improvements are needed; however, this new style of the meeting can be fruitful.

Financial/Material Support Statement

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Conflict of interest statement (COI): The authors declare no conflicts of interest in association with this study.

Data Availability statement

No underlying data was collected or produced in this study.

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