

The Impact of Multicultural Interfacility Video Case Conference: A Novel Education Model After the COVID Pandemic

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Abstract

Context: The COVID-19 pandemic challenged undertaking gradual educational activities for residency and fellowship trainees. However, recent technological advances have enabled broadening active learning opportunities through international online conferences.

Objective: The format of our international online endocrine case conference, launched during the pandemic, is introduced. The objective impact of this program on trainees is described.

Methods: Four academic facilities developed a semiannual international collaborative endocrinology case conference. Experts were invited as commentators to facilitate in-depth discussion. Six conferences were held between 2020 and 2022. After the fourth and sixth conferences, anonymous multiple-choice online surveys were administered to all attendees.

Results: Participants included trainees and faculty. At each conference, 3 to 5 cases of rare endocrine diseases from up to 4 institutions were presented, mainly by trainees. Sixty-two percent of attendees reported 4 facilities as the appropriate size for the collaboration to maintain active learning in case conferences. Eighty-two percent of attendees preferred a semiannual conference. The survey also revealed the positive impact on trainees' learning regarding diversity of medical practice, academic career development, and confidence in honing of presentation skills.

Conclusion: We present an example of our successful virtual global case conference to enhance learning about rare endocrine cases. For the success of the collaborative case conference, we suggest smaller cross-country institutional collaborations. Preferably, they would be international, semiannually based, and with recognized experts as commentators. Since our conference has engendered multiple positive effects on trainees and faculty, continuation of virtual education should be considered even after the pandemic era.

Key Words: videoconference, education, COVID-19, case conference

The COVID-19 pandemic brought with the life-threatening health problems yet also negatively affected social and economic activities [1, 2]. For medical education, trainee learning opportunities were altered, as patient-care encounters shifted to include video and telehealth, while academic conferences and teaching partially shifted to remote learning [3]. Concerns have been raised regarding negative effects on medical education outcomes for those trained during the pandemic, including reduced medical knowledge, lower test-pass rates and scores on knowledge examinations, and reduced academic inspiration and motivation [4].

Online video teaching conferences provide the opportunity for easy and convenient access to physically distant expertise and allows for community and relationship building.

Here, we introduce our example of an online international academic collaborative case conference. To the best of our knowledge, this is the first such report of an international web-based video case conference and its subsequent analysis. The conference participants were from 4 academic facilities in 3 countries. Twice a year, all participants joined fully synchronous presentations, including active learning-style discussion with commentary from world experts on each topic, enhancing

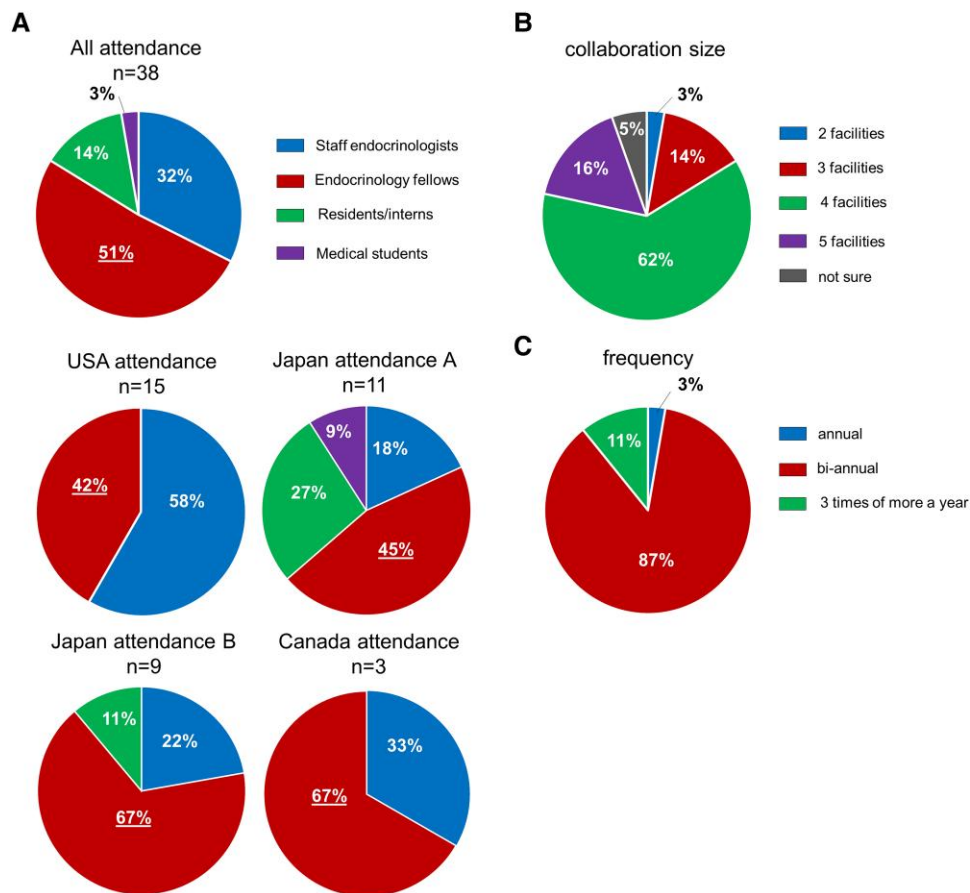


Figure 1. Interfacility case conference structures and impact on learners. A, Conference composition by attendee position and country is shown. Endocrine fellows' attendance is highlighted with underline. B, Questionnaire result about ideal collaboration size. C, Questionnaire result regarding ideal frequency of the conference.

medical knowledge and exposure to rare endocrine conditions. This format also allowed trainees to learn about cultural differences and diversity in medicine, while enhancing communication skills for nonnative speakers of English.

Materials and Methods

International Interfacility Online Case Conference

The conference started July 31, 2020, four months after COVID-19 was recognized as a pandemic [5]. As of December 2022, the conference has been held 6 times. Four institutions from 3 countries participated in the conference: University of Minnesota in the United States, Kobe University and Hokkaido University in Japan, and the University of Alberta in Canada. At least 1 or 2 cases were prepared from each institution per conference. A total of 3 to 5 cases were presented during the conference, which lasted 2 hours (Supplementary Table S1 [6]). The video link was supplied in advance to all endocrinology trainees and faculty. Committee members organized the presenting cases to avoid topic overlap and chose topic-specific guest commentators. The conference was held every 6 months.

Attendee Postconference Survey

At the end of the fourth conference (December 10, 2021), a multiple choice online anonymous survey was sent to all attendees and data collected and analyzed by committee members.

Attendee Pre- and Postconference Questionnaire

A 6-question assessment was given to attendees before and after the most recently held sixth conference in December 2022. All 6 questions were pertinent to the case topics presented at the conference. Three questions addressed awareness of differences in cultural and/or country-specific practices other than the attendees' country of origin; therefore 3 modified versions were prepared (Supplementary Table S2 [7]). The clinical knowledge questions were the same for all attendees.

Statistics

The difference in responses before and after attendance was analyzed using a paired *t* test. Probability of *P* less than or equal to .05 was considered statistically significant.

Results

Six conferences were held between July 2020 and December 2022. Four academic institutions from 3 countries participated as described in "Materials and Methods". Approximately 40 attendees joined each conference. The fourth conference attendees comprised the following: attending physician faculty endocrinologists (32%), fellow endocrinologists (51%), internal medicine residents (14%), and medical students (3%) Numbers and types of attendees from each facility are shown in Fig. 1A. Endocrine fellow attendance ranged from 42% to

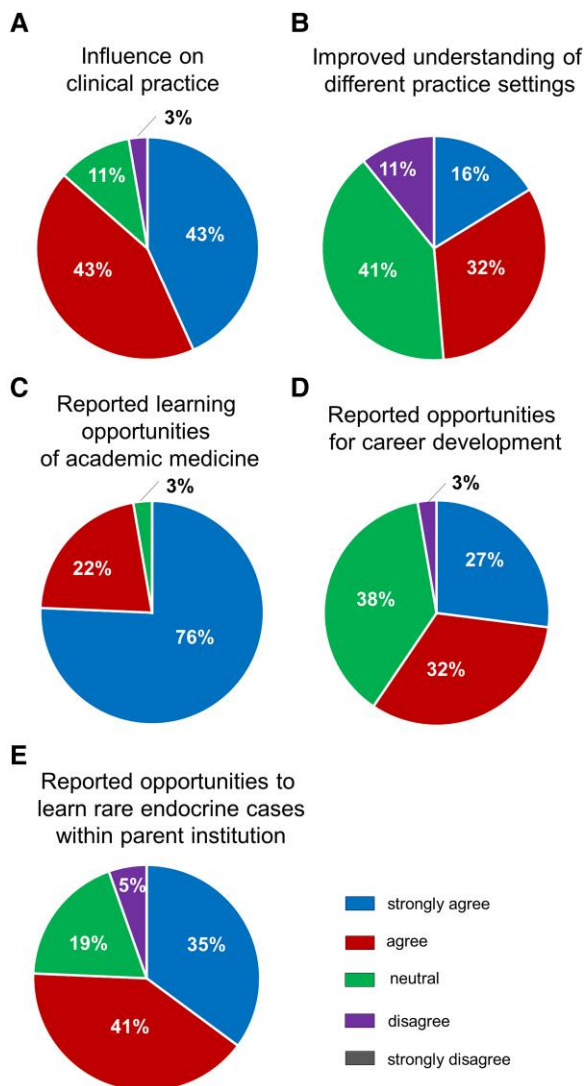


Figure 2. Impact for endocrinology learners. Impact of the conference on A, clinical practice; B, on improved understanding of different practice settings; C, on reported learning opportunities of academic medicine; D, on reported career opportunities, and E, on reported opportunities to learn about rare endocrine cases within the parent institution.

67%. A variety of general endocrinology and neuroendocrinology topics were covered (see Supplementary Table S1 [6]). They included completely analyzed cases with pathological and molecular analysis as well as cases in the process of diagnosis. Seventeen cases were pituitary disorders, 3 cases were neuroendocrine tumors, 3 cases were adrenal disorders, and 1 case was a thyroid disorder. Presenters were endocrinology fellows ($n = 21$), a medical student ($n = 1$), pathology faculty ($n = 1$), and neurosurgery faculty ($n = 1$).

Attendees responded to specific questions about the conference format, number of collaborative institutions, and frequency of the meetings (Fig. 1B and 1C). Sixty-two percent of the attendees found 4 institutions to be an appropriate size for collaboration in such an interfacility case conference, whereas 16% preferred 5 facilities, and 14% preferred 3 facilities (see Fig. 1B). Eighty-seven percent of the participants chose twice a year as an appropriate frequency for the conference (see Fig. 1C). Ninety-seven percent of the attendees expressed their wish to attend subsequent sessions. Attendee

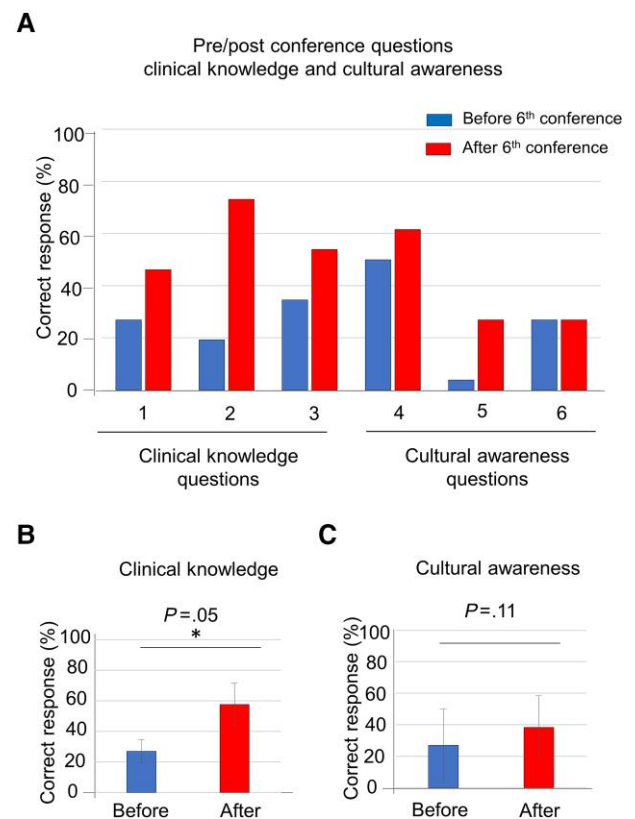


Figure 3. Impact on clinical knowledge and cultural awareness at the sixth conference. Percentage correct responses before and after sixth conference for A, each question; B, all clinical knowledge; and C, all cultural awareness questions.

conference experiences were similar among the 3 countries. Based on feedback from participants, time management was the most frequently mentioned area for improvement, with a change in start time requested by US attendees as well as those from Japan and Canada. Currently conferences have been held Friday evenings in the United States and Canada, and Saturday mornings in Japan. Based on the comments from the United States and Canada, the conferences should be held in the evening after their routine work schedule.

We also asked questions about the impact of the conference on attendee education, career development, and clinical practice by selecting from 5 descriptions (strongly agree, agree, neutral, disagree, and strongly disagree). These results are shown in Fig. 2. Regarding the impact on clinical practice, by combining the answers strongly agree and agree, 86% of the attendees acknowledged that the conference has influenced their clinical practice (Fig. 2A). Regarding learning about medical diversities, 48% of attendees agreed that they have learned more about cultural diversities from the medical standpoint, such as differences in clinical approach, available treatment options and management, clinical guidelines, as well as health systems between countries (Fig. 2B). Ninety-eight percent were satisfied that the conference provided helpful information about challenging rare endocrine cases (Fig. 2C). Fifty-nine percent of the attendees either agreed or strongly agreed that the conference has had positive effects on academic career development for trainees and junior faculties (Fig. 2D). Since we initially thought that the COVID-19 pandemic may have restricted the number of

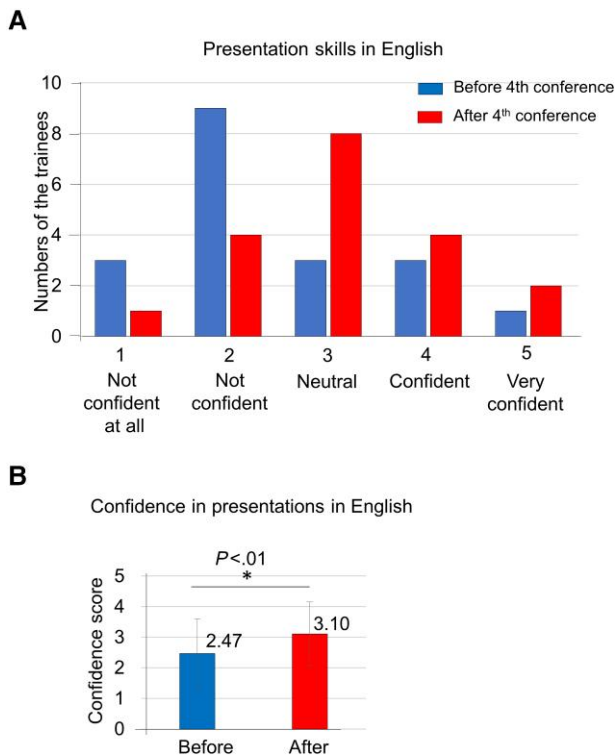


Figure 4. Impact for subpopulations of endocrinology learners with English as a second language at the fourth conference. A, Impact on learning presentation skills in English, and B, changing of the confidence on presenting skills in English before and after the fourth conference. 1 to 5 indicate the following: 1: not confident at all, 2: not so confident, 3: neutral, 4: confident, 5: strongly confident.

learning encounters for rare endocrine diseases, we also asked whether each facility has enough teaching cases. Seventy-six percent indicated their facilities have enough encounters with rare endocrine cases to learn/teach (Fig. 2E).

Furthermore, to evaluate direct outcomes of enhancement of clinical knowledge and cultural awareness in medicine, we performed pre- and postconference questionnaires (Fig. 3). Pre- and postconference correct response rates on cultural awareness and clinical knowledge questions are shown in Fig. 3A. For clinical knowledge questions, there was an increase in correct responses after the conference ($P = .05$; Fig. 3B). For cultural awareness questions, there was a tendency of increased correct responses, although this was not statistically significant ($P = .11$; Fig. 3C).

We also assessed the impact on English presentation skills for nonnative speakers (Fig. 4). Seventy percent of the trainees whose primary language was not English responded that the conference was helpful in improving English skills. Their confidence in presenting clinical cases in English significantly improved after the conference. The questionnaire conducted at the end of the fourth conference showed that there was a shift toward higher scores at the end of the fourth conference when compared to the first conference (Fig. 4A). The average scores of confidence in case presentation in English significantly increased at the end of the fourth conference ($P < .01$; Fig. 4B).

Discussion

The COVID-19 pandemic has restricted opportunities for gathering and discussion in many settings and has thereby

severely affected society. This adverse impact also applies to medical education: reducing face-to-face patient encounters and teaching sessions, decreasing knowledge examination scores and passing rates, and negatively affecting motivation to pursue academics [4, 6]. To counter the negative impact on medical knowledge and teaching, we initiated a multifacility international video case conference as a new education method for trainees.

During this pandemic era, virtual learning has been incorporated into medical education, including postgraduate education. It is important to assess benefits and drawbacks of such an educational shift. The main benefits of video-conferencing are ease of accessibility, safe and comfortable environment, and enhancing student independence and self-learning capacities. The drawbacks are isolation and minimal interactions with peers, requirement of reliable internet access, lack of direct assessment, and inability to acquire the nonmedical skills of a physician such as leadership and teamwork [8].

Publications related to online education have emerged during the pandemic [9–16]. We found 8 publications describing collaborative methods of online active learning for clinical education (Table 1). The assessment of the methods and outcomes of these conferences were varied and most were subjective. These conferences have covered a variety of medical fields including pathology, anesthesiology, and surgery; however, we could find only one published collaborative conference on the topic of internal medicine (geriatrics) [15]. This could be a publication bias, or there may be no need/demand to establish such a collaboration. Among the 8 conferences, the main collaborative scope is domestic and only 2 conferences are international collaborations [12, 13]. Regarding the collaboration size, 6 conferences (75%; see Table 1) had 4 or fewer collaborating facilities [9–14], suggesting that such numbers of collaborators could be optimal and practical. One clinical pathology conference emphasizes that sharing rare cases between facilities is an advantage of online case conferences [13]. The number of attendees needed to create an optimal environment was not well described in the literature; however, in our case the number of attendees was 30 to 50 each time.

Our collaborative international clinical conference has several features and strengths. The first advantage is that sharing infrequent or rare diseases with experts broadens clinical experience and knowledge. The second advantage is that we have access to world experts via the online conference, which more than compensates for individual institutional deficiencies. Widening the scope of expertise in this manner may be more beneficial and efficient than any single facility's face-to-face conferences. Although we do not yet have comprehensive outcomes, the conference format appears helpful and encouraging for academic career development. The trainees have the opportunity to learn expert-guided, cutting-edge, “real-world” clinical care to understand the bedside to bench concept, where targeted and result-oriented research enhances understanding in endocrinology. Finally, since this is an international collaboration, the conference enhances clinical knowledge as well as understanding of cultural differences and diversity in medical practices, including differences in laboratory test methods, standard drug therapies, and clinical guidelines. These collaborations also enhance networking and build international and interfacility community.

For the future implementation of such collaborative case conferences, we asked attendees for the optimal format of the conference. The ideal size of a collaborative clinical video

Table 1. Virtual active learning conferences after the COVID-19 pandemic

No. of facilities	International or domestic	Country	Specialty topics	Teaching model	Reference
16	Domestic	USA	Neonatal perinatal medicine	Flipped classroom model—discussion	Beer et al, 2020 [17]
14	Domestic	USA	Geriatrics	Flipped classroom model, interactive lectures, workshops	Duggan et al, 2020 [16]
4	Domestic	Qatar	Clinical pathology	Flipped classroom model	Guiter et al, 2021 [15]
3	International	USA, India, Brazil	Clinical pathology	Asynchronous online learning	Balakrishnan et al, 2020 [14]
2	International	New Zealand, Samoa	Global health	Flipped classroom model	Bothara et al, 2021 [13]
1	Domestic	Germany	Neurophysiology	Flipped classroom model	Duszenko et al, 2022 [12]
1	Domestic	UK	Anesthesiology	Flipped classroom model	Eusuf et al, 2020 [11]
1	Domestic	USA	Surgical education	Flipped classroom model—discussion	Chick et al, 2021 [10]

Abbreviations: UK, United Kingdom; USA, United States of America.

conference is rarely discussed in the literature. Unlike conventional academic congresses, we believe that appropriate numbers of participating institutions dictate the efficiency and success of clinical video-case conferences to promote active learning [17]. Based on our survey, the collaboration of 3 to 5 facilities appears to be the ideal participation size for a video-case conference. This result matches the collaborative size average in the literature [9–14]. We speculate this relatively small collaboration size is the key to maintaining motivation for attendance and active discussion, since it allows each facility to present at least one case per conference.

Our study has several limitations. First, our assessment of the ideal format of the conference is based on subjective survey data rather than objective tools. To our knowledge, none of the attendees had previously experienced interfacility case conference formats other than conventional single-center case conferences to provide an experiential comparison. Nevertheless, we did obtain consensus as a majority agrees on the ideal format regardless of the attendees' position or country of medical practice or education. Second, pre- and postconference assessments for clinical knowledge and cultural awareness was performed only once. Therefore, to evaluate the true impact, a larger sample of data obtained from repeated assessments are needed.

Conclusion

We launched a multicultural, international, interfacility video-case conference during the COVID-19 pandemic. This model serves as a basis for further development of education without borders. Recently, as mortality from COVID-19 infection has reduced, infrastructural systems have been returning to pre-COVID-19 ways including face-to-face medical education. Consideration should be given to maintain some of the favorable virtual progress that came with the pandemic, such as the multicultural, international, interfacility video-case conference we describe.

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Disclosures

The authors have nothing to disclose.

Data Availability

Some or all data sets generated during and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

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