

Web-based Virtual Cardiac Symposia: A New Approach for Worldwide Professional Medical Education

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SUMMARY

Background The internet is an extremely powerful tool for the transmission of data and knowledge, and the question is whether this technology can be used effectively in continuing medical education. We present our experience with worldwide, web-based virtual symposia for practicing physicians.

Methods The International Society for Holter and Noninvasive Electrocardiography (ISHNE) decided four years ago to conduct a series of cardiology-related educational activities for physicians utilizing a web-based approach. Six educational events under the format of virtual symposia were held on the internet during the years 2002 to 2006. These internet events included symposia on Brugada syndrome (2002), the long QT syndrome (2004), arrhythmogenic right ventricular dysplasia (2005), atrial fibrillation (2005), heart failure (2006), and sudden cardiac death (2006).

Findings During the past 4 years, there has been a dramatic and progressive increase in the number of physician registrants, the number of countries represented, and the number of lectures downloaded with each subsequent virtual symposium. For example, during the month of October 2006, the internet-based sudden cardiac death symposium involved 14,087 physician registrants from 120 countries with 64,939 lectures downloaded. The top lecture was downloaded 11,251 times, and over 200 e-mail questions and replies were exchanged. The average time per visit to the web site was 12.5 minutes.

Interpretation The progressively increasing numbers of physician registrants from around the world who participated in these web-based, virtual symposia suggest that this approach is answering an unmet professional educational need. This internet approach adds an important, new, low-cost dimension to continuing medical education.

Key words

Virtual Symposium - Educational activity – Web-based educational forum

Introduction

The internet is an extremely powerful tool for the transmission of data and knowledge, and with this concept in mind, the International Society of Holter and Noninvasive Electrocardiography (ISHNE) decided four years ago to conduct a series of internet-based, cardiology-related, educational activities based on a virtual symposium concept. The original idea consisted of performing those activities that had been traditionally developed for direct person-to person interactions, but this time in a "virtual world." The aim was to achieve greater levels of participation and interactivity between the lecturers and the attendees using specific internet-based discussion forums linked through e-mail communication exchanges.

Methods

Since 2002, six ISHNE-sponsored educational virtual symposia have been held on the internet. These internet events included symposia on Brugada syndrome (2002), long QT syndrome (2004), arrhythmogenic right ventricular dysplasia (2005), atrial fibrillation (2005), heart failure (2006), and sudden cardiac death (2006).

In these virtual symposia, the official language was English, but the virtual symposia were translated into several languages (Chinese, Portuguese, Russian, and Spanish). With this approach, we were able to ensure greater world-wide penetration, thus achieving the participation of several thousand professionals around the world.

The response by the faculties and the physicians/cardiologists participating in the sessions over the internet has been remarkably positive. A summary of the activity of the first two Virtual Symposia has been published previously.¹

The structure of each internet-based symposium was similar and included an Honorary President who was a renowned international specialist, an actual Chair held by a member

assigned by ISHNE, a Co-Chairman (chosen by the Honorary President) who worked as a member of the scientific committee, an ISHNE Organizing Committee responsible for the functional structure of the event (approximately 30/40 faculty members), and a group of experts made up of specialists from different countries who worked on the topic and who were in charge of asking questions to the faculty (in addition to all the spontaneous questions from the international participants). Each web-based program was placed on the internet for one month.

Invited faculty members provided a series of lectures with slides, web casts, radio interviews, and case presentations that were placed on the web, with the opportunity for physicians from around the world to ask questions via e-mail. The questions were directed to and screened by the Organizing Committee from Argentina, and the e-mail questions were subcategorized into specific topics. Over the course of the one-month symposium, each of the 30 faculty members received no more than 10 e-mail questions directed to them for brief replies. The replies went back to the Organizing Committee, and they posted the questions and answers on the web site.

The ISHNE Organizing Committee in Buenos Aires involving cardiologists, information specialists, network specialists, graphic designers, sound and image engineers, and translators provided the logistics for the Virtual Symposia. Corporate sponsors supported the virtual symposia by means of grants to ISHNE, a non-profit international cardiology society. The funding to ISHNE was simply to cover expenses. Since the virtual symposia are entirely an educational activity, the faculty, including each Honorary President, was not paid any honorarium.

By defining the objectives of each event, priorities were established. The presentations of the well-known specialists were modified for the internet environment, thus making the lectures,

slides, and texts attractive documents that could be accessed easily by participants. The presentations were provided in different formats, and radio interviews were used involving the common resources of professional radio broadcasting. This material was linked interactively to a multilingual discussion forum.

Registrants for the web-based symposia were limited to physicians. ISHNE has a large database with e-mail address on over 50,000 physicians worldwide, and mass e-mail invitations about each symposium were sent to these physicians. All those who were interested in participating in the described symposia were given a password to log in. In addition, ISHNE governors and organizers of other cardiac symposia were encouraged to send letters to their members describing the symposium and supplying them with a password to log in. The sponsors who provided financial support for the virtual symposia advertised the upcoming symposium in medical journals. The registrants identified their clinical area of practice, and in the last symposium on sudden cardiac death there were 14,087 physician-registrants with 45% who identified themselves as clinical cardiologists, 16% electrophysiologists, 9% out-patient clinicians, 8% internal medicine, and the remaining 18% representing a spectrum of specialties; only 4% did not identify a medical practice.

Results

Summary statistics of the six web-based virtual cardiac symposia produced between 2002 and 2006 are presented in Table 1. The numbers of physicians registered and involved in each symposium, the countries of origin of the registrants, and the numbers of educational items (lectures, webcasts, and radio interviews) downloaded during each symposium progressively increased with each subsequent program. Between the first and sixth virtual symposia, there was

a 673% increase in registrants participating in the web-based programs, from 1,831 in 2002 to 14,087 in 2006.

Details of the last virtual symposium on sudden cardiac death that was produced in October 2006 are provided in Tables 1 and 2 and Figure 1. A total of 14,087 registrants from 120 countries participated in the virtual symposium (Table 3). Lectures by the selected specialists were much more frequently downloaded than web casts or radio interviews. On average, there were 450 visits per day to the web site during the month of October, with the time per visit averaging 12.5 minutes. The number of web-based pages viewed per day ranged from approximately 4,000 to 20,000 per day, with a daily average of 8,037 pages; a total of 249,155 web-based pages were viewed during the month of October. Over 200 e-mail questions were submitted by the registrants to the Organizing Committee, with most of the questions asking the expert faculty for their opinion regarding the management of patients with challenging cardiac problems. The responses by the faculty were placed on the web site, and these responses frequently generated additional comments from other faculty members with enlightening interchanges.

During the last two virtual symposia in 2006, continuing medical education credit (CME) was made available to the registrants under the auspices of the Continuing Professional Education Department at the University of Rochester Medical Center. The CME questions were based on the content of the lectures. The registrants applied for CME credit, a web-based automated application and grading process was developed, and CME certificates were generated for those who passed the test. A majority of the participants requesting CME credit were from the United States.

Discussion

The number of physicians who use the internet for activities related to their professional responsibilities, including their post-graduate education, is rapidly growing.^{2,3} Improvements in professional performance are attributed, in part, to the use of internet resources to enhance medical education. Accurate studies using objective evaluation measures are important to properly evaluate the full impact of this new technology.⁴⁻⁷

The data presented in Tables 1 and 2 highlight the fact that disease states of low prevalence involving infrequently occurring disorders like long QT syndrome and arrhythmogenic right ventricular dysplasia as well as common disorders with high prevalence like atrial fibrillation and sudden cardiac death attract substantial interest. The high level of interest from participants from all continents and the minimal cost of participation in web-based virtual symposia when compared to traditional international meetings that necessarily involve expenses due to traveling, hotel accommodations, interruption of professional activity, etc., should be taken into account by the scientific societies and by their traditional sponsors.

Our web-based approach with focus on lecture-type presentations with PowerPoint slides, similar to symposia presentations at large society meetings, has an added interactive dimension that allows registrants to ask questions by e-mail of the faculty. We believe this approach is unique for it draws upon the interest and motivation of physicians to expand their medical knowledge at times that are convenient to their schedule. It is interesting that most of the e-mail questions asked by the physician registrants were case-based and were related to management of patients with challenging problems for which the individual registrant physician had limited experience.

We believe that such education activities should be linked to Continuing Medical Education (CME) and Continuing Professional Development (CPD) credits. Also, scientific institutions devoted to CME and other groups such as The National Committee for Quality Assurance (NCQA) should be involved to guarantee the excellence of the programs and to avoid conflict of interest issues.^{8,9}

In the year 2001, there were more than 100 U.S.-based websites involved in continuing medical education that delivered different types of post-graduate courses.¹⁰ The number of such websites is increasing rapidly. Nevertheless, there are still few institutions or societies that use the internet to perform educational activities such as medical conferences and/or symposia like those described in this paper.¹¹⁻¹⁴

A limitation of our web-based, virtual educational programs is that we do not have uniform feedback from the registrants regarding their evaluation of the educational experience. We have received numerous e-mail letters from registrants following each web-based symposium thanking us for the educational program. We are in the process of developing a formal follow-up evaluation procedure in conjunction with the Continuing Medical Education program to document the practical usefulness of this educational activity. The increasing number of registrants, the number of downloaded educational items, and time spent per visit on the web suggest that we are answering an unmet educational need.

Additional Information

Authors' Contributions: Drs. Dubner, Moss, and Schapachnik had full access to all of the data in the study and take full responsibility for the integrity of the data and the accuracy of the data analysis. All the other authors were faculty in one or more of the symposia and participated in the concept and design of the virtual symposia.

Conflict of Interest Statement: Dr. Levine is a salaried employee of St. Jude Medical, one of two corporate sponsors that supported the virtual symposia by means of grants to ISHNE, a non-profit international cardiology society. None of the other authors of the manuscript had any conflict of interests.

Role of Funding Source: The funding to ISHNE was simply to cover expenses. Since the virtual symposia are entirely an educational activity, the faculty, including each Honorary President, was not paid any honorarium.

Ethics Committee Approval: None required since no research subjects were involved. The web-based programs were approved by the Continuing Professional Education Department of the University of Rochester Medical Center.

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11. Congress of Pathology <http://www.conganat.org/7congreso/index.asp>

12. VI Virtual Congress of HIV/AIDS <http://www.aidscongress.net/>

13. IV Virtual Congress of Cardiology <http://www.fac.org.ar/ccvc>

14. First Ibero-American Virtual Congress of Neurology

<http://neurologia.rediris.es/congreso/index-e.html>

Table 1. Summary description of 6 worldwide, web-based, virtual cardiac symposia presented during 2002 and 2006

Program Year	Honorary President	Number of Registrants	Number of Countries Represented	Downloaded Educational Items
Brugada Syndrome 2002	Dr. Pedro Brugada	1,821	22	No data
Long QT Syndrome 2004	Dr. Arthur J. Moss	2,716	48	23,811
Arrhythmogenic Right Ventricular Dysplasia 2005	Drs. Frank Marcus and Guy Fontaine	3,147	75	28,736
Atrial Fibrillation 2005	Dr. John Camm	7,245	94	33,981
Heart Failure 2006	Dr. Arthur J. Moss	11,899	108	50,634
Sudden Cardiac Death 2006	Dr. Douglas Zipes	14,087	123	64,939

Table 2. Visits to the website for the Sudden Cardiac Death Symposium during the month of October 2006

Item	
Number of registrants	14,087
Total website pages viewed	249,155
Daily average website pages viewed	8,037
Mean number of visits to website per day	450
Average time spent per website visit (min.)	12.5

Table 3. Number of physician per country registered for the Sudden Cardiac Death Symposium during the month of October 2006

Argentina	2467	Lithuania	35	Kuwait	3
China	2292	Thailand	33	Trinidad and Tobago	3
United States	1098	South Korea	33	Belize	3
Russia	687	El Salvador	32	Iraq	3
Mexico	681	Denmark	32	Honduras	3
Brazil	648	Malaysia	30	Bangladesh	3
Peru	597	Romania	29	Indonesia	3
Spain	503	Iran	27	Philippines	3
Uruguay	495	Czech Republic	23	Zambia	2
Cuba	453	Turkey	21	Andorra	2
Columbia	392	Switzerland	20	Bosnia	2
Venezuela	297	Nicaragua	20	Brunei	2
Poland	291	Vietnam	20	Cyprus	2
Italy	208	Georgia	18	Jamaica	2
Chile	171	Puerto Rico	17	Morocco	2
Israel	166	Croatia	17	Nigeria	2
Greece	135	Egypt	15	Norway	2
Ecuador	134	Singapore	15	Sudan	2
Bolivia	119	New Zealand	15	Tanzania	2
India	110	Albania	15	U.S. Virgin Islands	2
United Kingdom	104	Hungary	14	Angola	1
Japan	104	South Africa	14	Mongolia	1
Canada	95	Yugoslavia	13	Malta	1
Taiwan	93	Lebanon	13	American Samoa	1
Germany	90	United Arab Emirates	12	Macau	1
Panama	87	Latvia	11	Kyrgyzstan	1
Ukraine	87	Armenia	11	Jordan	1
Belgium	84	Macedonia	9	Gambia	1
Belarus	81	Azerbaijan	9	Afghanistan	1
Portugal	78	Ireland	8	Uganda	1
Australia	77	Uzbekistan	8	Congo	1
France	62	Saudi Arabia	8	Burma	1
Sweden	57	Tunisia	6	Bulgaria	1
Netherlands	54	Pakistan	6	Benin	1
Dominican Republic	53	Slovenia	6	Barbados	1
Finland	50	Slovakia	6	Saint Lucia	1
Guatemala	44	Algeria	4	Qatar	1
Costa Rica	41	Kazakhstan	4	Oman	1
Hong Kong	39	Bahrain	4		
Paraguay	38	Moldova	4		
Austria	36	Estonia	3		

Figure Download statistics during the Sudden Cardiac Death Symposium in October 2006. Top: total number of downloaded lectures, webcasts, and radio interviews. Middle: number of downloads among the top 10 lectures. Bottom: number of webpages viewed daily during the month of October 2006.

