Telephone-based videoconferencing may prove to be important in helping rural medical practitioners in the Khabarovsk Territory to enhance the quality of health-care.

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▶ Telemedicine in the service of peace

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Summary

Ophthalmology is well suited to telemedicine, since optical and imaging devices provide the basis for virtually all ophthalmic patient evaluations. We established the Middle East Ophthalmology Network among ophthalmologists working in 10 major ophthalmology centres in Israel, Jordan, Morocco, the Palestinian Authority and Tunisia. The project offered some 50 physicians around the Middle East the opportunity to benefit from sharing clinical consultation for diagnosis and management decisions beyond physical and political boundaries. In the first year, over 100 consultations took place. The system overcame some of the constraints imposed by the uneven distribution of medical resources and expertise in the region, reduced professional isolation, encouraged more collaboration between physicians and offered 'peace dividends' from cooperation between physicians across the political divide.

Introduction

Ophthalmology is well suited to telemedicine, since optical and imaging devices provide the basis for virtually all ophthalmic patient evaluations, and all the instruments used

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to perform a comprehensive eye examination can be modified to allow transmission of their output. In fact, much of the ophthalmic diagnostic equipment currently used captures and stores images of ocular structures in digital format, which can be readily transferred over telecommunications links. In addition, ophthalmologists devote a significant proportion of their time to assessing and interpreting clinical findings from diagnostic images. Hence, ophthalmologists are well versed in making diagnoses, prescribing therapy and designing treatment plans on the basis of images of eye pathology[1].

Methods

We established the Middle East Ophthalmology Network in 1999 among ophthalmologists working in 10 major ophthalmology centres in Israel, Jordan, Morocco, the Palestinian Authority and Tunisia. The project aimed to offer asynchronous consulting to some 50 physicians around the Middle East and North Africa. This gave them the opportunity to benefit from sharing clinical consultation for complex diagnosis and management decisions beyond physical and political boundaries.

Any member of the Middle East Ophthalmology Network could be consulted simply via the Internet using special software. Clinical data could be entered by voice annotation or by completing a medical history form; additional information could be sent as attachments (e.g. images such as fundus pictures, angiograms and intra-ocular pressure profiles). The chosen expert could simply open the message clip to evaluate the transferred information. He or she was then able to respond by voice annotation, by typing a short comment or by drawing a picture.

In the first year, over 100 consultations took place.

The project employed an experimental communication platform, MedStage, that was developed at the Basic Research and Development Department of the Siemens Medical Engineering Group.

MedStage

The MedStage software was based on Internet technology. Its data security used a public-key infrastructure. All users received two asymmetric key pairs (one for data encryption and one for digital signature) on either floppy disk or smart card.

To access patient lists, a separate patient index based on the CORBAmed Person Identification Service was used, where patient-identifying data (name, date of birth, address, security number) were stored, together with an encrypted identifier for the root medical record in the data repository. All medical data were structured into folders, link items and medical data items. Every component had a version number, with information about the creator, a start time, when the version was added, a digital signature of a pseudo-text describing the operation in which the version was added and an optional end time, when the version became invalid.

The medical data item consisted of a code to specify the kind of data item (e.g. 'scan.retina'), a specification of the presentation component (e.g. image/jpeg), an identification of the subject of care (e.g. a patient id), a display name and an access control list. Data items could be reached using vertical navigation through the folder structure, by following links or by direct horizontal queries on data items (e.g. 'find all ocular images of patient 1234 in the last six months').

Discussion

The network linked researchers and clinicians via Internet-based telemedicine and created a virtual regional centre of excellence. This allowed Internet-based case-oriented consultation for diagnosis and management decisions to the benefit of patients and physicians alike.

The advanced information management capabilities of the network introduced the potential for greatly enhancing the delivery of ophthalmic services and improving outcomes compared with conventional eye care. This allowed sharing of the skills and know-how within the medical community of the region. The main benefits of the system were that:

(1) it minimized the constraints imposed by uneven geographical distribution of medical resources and expertise;
(2) it reduced professional isolation and encouraged more collaboration between physicians to the benefit of all patients;
(3) 'peace dividends' were gained through the cooperation of physicians across the political divide.

Documentary film

This telemedicine initiative featured in a documentary film entitled *Peace in Sight*, which was a co-production of the Al-Quds University Media Department, a Palestinian university based in East Jerusalem, the Israeli Zoog Production company and the Peres Center For Peace. The film portrayed a day in the life of four eye patients and their physicians in four of the participating countries. The process of the introduction of the system and its integration among the participating ophthalmologists were an important part of this presentation. The film also offered an insight into the complex realities of the region and depicted telemedicine in a unique role as a medium for peace building, by improving outcomes in the diagnosis and treatment of patients.

Conclusion

The method and the technology used to achieve the results of the Middle East Ophthalmology Network are not novel. The merits of the project lie with the social and political benefits of being able to bridge a gap between members of the medical community in a troubled region. Telemedicine can thus be seen to serve the aims of world peace.

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