IMPROVEMENT OF MEDICAL QUALITY IN RURAL AREAS BY USING REAL-TIME TELE-DIAGNOSIS SUPPORTED BY CHAT CONFERENCE SYSTEM WITH GI-POF NETWORK

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Abstract: In Japan, rural hospitals and clinics have problems of insufficient medical equipments and shortage of doctors and nurses, while their quality level is similar to that of urban general hospitals. The author proposes a real-time tele-diagnosis system using high speed GI-POF (Graded Index Plastic Optical Fiber) network combined with virtual chat conference which includes doctors' second opinions and solutions against patient's clinical problems [1] to improve medical quality.

Key words: Telemedicine system, Virtual chat conference, Doctor's second opinion

1. Introduction

Information and communication technologies (ICTs) have been making considerable impact on the society. While the businesses and urban communities have seen the possible contribution of ICTs in several dimensions like increases in efficiencies, communications and information on anytime-anywhere basis [2]. Using recent advanced ICTs, qualities of medical treatments have been improved in urban areas. As a result, it rather widens a quality gap between rural and urban areas.

This paper describes a proposal of tele-diagnosis system from the viewpoint of medical quality improvement in rural areas. It also covers the telemedicine system with virtual chat conference [3] including doctors' opinions and solutions of clinical problems and explores a possibility of quality improvement measures in the healthcare at the rural areas. (Fig. 1)

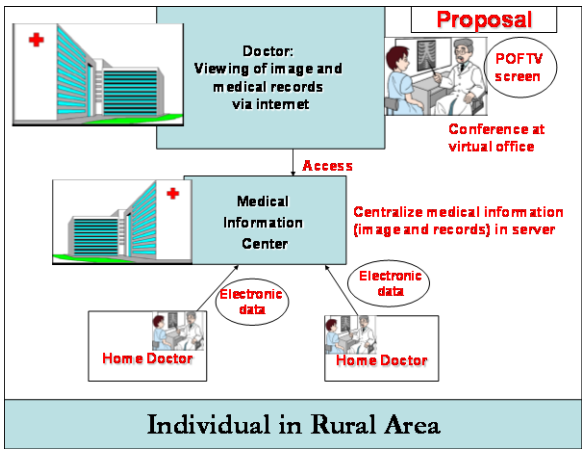

Fig. 1 Virtual conference systems

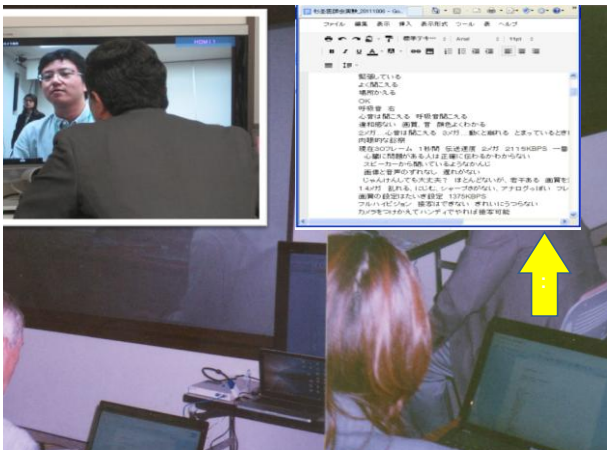

Fig. 2 Chat conference systems

2. Rationale and Methodology

We simulated virtual chat conference from a medical staff point of view in cooperation with Suginami Medical Association. Several PCs were installed near a 32-inch monitor, which displayed a patient who sit in a distant place in the same building connected through high speed GI-POF network (a pair of HD quality video conferencing system from Tandberg was used).

While a main doctor was consulting the patient through the real-time high quality video, a medical clerk recorded the conversation between the doctor and the patient by typing it into one of the PCs. We then asked other participated doctors to input their diagnostic data or second opinions into the other PCs using Google Document to share all data each other into one document (Fig. 2).

This chat conferencing system reduces a time required for people to receive medical service and helps improve

medical services, After we analyzed the shared document from the virtual chat conference, we obtained the following positive results of experiment (14 points out of 24 points) from doctors having different specialties in Suginami Medical Association (Table 1). According to Table 1, we confirmed that the virtual chat conference was a practical system concerning new medical devices.

Table 1 Analysis of virtual chat conference in Suginami Medical Association

Doctor's Specialty	**Accuracy**	**Speed**	**Trouble**	**3D**	**Chat Type**	**Diagnosis**
Internal medicine	good	good	even	even	good	even
Surgery	good	good	good	good	good	good
Dermatology	good	good	good	even	good	good
Otolaryngology	good	good	even	*bad*	even	*bad*

Good:1point, even:0 point, *bad*:-1point

3. Discussions

3.1 Findings

The proposed real time tele-diagnosis system serves to bridge the gap between doctors in urban hospitals and rural hospitals, and everyone in the society gets equal benefit from the system. In terms of cost, it reduces medical costs by using virtual chat conference and early solution of diseases.

3.2. Suggestions

The system is technically feasible, although it needs substantial investments. There are only two ways in which it could be made economically viable, either by obtaining government support for the medical system or by providing a bundle of shared services using the same system.

4. Conclusions

A real-time tele-diagnosis chat conference system using GI-POF network was proposed. It can be promising to improve the healthcare service quality in distance places. We confirmed the effectiveness of combining a chat system in the real-time virtual conference including POF system through the experiment in Suginami Medical Association. Thus in anytime-anywhere doctors can diagnose with patients without a face to face diagnosis. Usage of remote teleconference is discussed in relation to critical path (disease control system) based on doctor's second opinion provided.

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