

TELE ENT: A Step Forward in Providing Specialist Services in Far Remote Areas

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Abstract

Background: To study the utility of tele medicine in providing ENT services to far remote areas

Methods: In this descriptive study 2 hourly weekly consultations were given by ENT consultants on every Friday in Tele Medicine office. Four remote areas were connected through strong satellite connectivity of 512 Kbs and 1 MB to Pindi through video conferencing with real time imaging modality was used. The tools used to diagnose the patients were video Otoscope to examine the ear, video endoscope and tongue depressor for oral cavity examination. Routine blood and urine examination along with required other specific tests like x-Ray, pure tone audiometry were advised accordingly, then patients were given treatment for their specific problem and given dates for follow up visit. Some patients were booked for surgery and given date of admission in our hospital. Only some patients with laryngeal and nasal problems were asked to visit the OPD for a clearer and better diagnosis as nasal and laryngeal examination could not be done through video conferencing. Patients who were given time for surgery got their investigations done in their home town and were admitted straightaway as they arrived in our hospital. These patients were scheduled for surgery on the next list, and were successfully operated and followed up post operatively.

Results: A total of 2159 patients were included in our study, two third of which were females and rest male. Majority of our patients had ear problem followed by throat and nasal problems 1287 of our patients were successfully managed conservatively through video conferencing. A total of 792 patients were referred to us in Holy Family Hospital out of which 661 were successfully operated and out of these patients 459 were followed up postoperatively through video conferencing. The major operations done were Tonsillectomy, Septoplasty, Endoscopies (direct laryngoscopies and esophagoscopies), mastoidectomies, and thyroidectomy. A few emergency cases like foreign body nose and ear

removal along with foreign body throat removal, incision of peritonsillar abscess and mastoid abscess were also done.

Conclusion: Video conferencing in ENT is an effective tool and method of assessing and treating ENT conditions. Through Tele ENT potential surgical admissions can be screened..

Key Words: Tele Medicine, ENT, Services

Introduction

Ear nose and Throat problems are common among all general population in any country but unfortunately there are a few ENT specialists in Pakistan. More over the specialists are confined in major cities of Pakistan the rural areas are devoid of not only the facilities but also of specialist. Rural patients who develop ENT disorders often do not seek or get specialty care due to multiple logistic and economical factors. Our aim of the study was to provide ENT specialist service and care to these people which are as good and up to the standards in any well equipped and well facilitated tertiary hospital. This method of treating the patients was a new experience for us and enabled us to provide better services at a lower cost to these patients located in far remote areas, and it saved them one or two journeys to a tertiary hospital for a pre-admission appointment. Tele ENT is a part of Tele Medicine. Telemedicine is transfer of electronic medical data (high resolution images, sound, live videos and patient records) from one location to another. The WHO¹ has defined the word Tele Medicine as "the delivery of health care services, where distance is a critical factor, by all health care professional using information and communications technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, all in the interest of advancing the health of individuals and their communities".¹

Telemedicine has a great appeal and promise as a means of health service delivery to smaller communities at some distance from major health facilities. Benefits include rapid delivery of diagnostic and other health services, avoidance of economic and social consequences of travel, for patients, their families and health professionals. Telemedicine plays a

major role in changing the way health care and health related information are accessed and delivered in developing and under developed areas which have poor physical facilities for communication, transport and limited number of medical facilities. The history of telemedicine dates back to 1906 when the first ECG transmission was made over telephone, followed by 1920 when physician linked with patients on ship through radio. ¹ In 1955 Nebraska tele psychiatry used closed circuit TV. In 1971 the Nebraska medical centre was linked with Omaha veterans. The first satellite telemedicine project (store and forward technique) was launched in which Ear, Nose and Throat services were provided to remote Alaskan and Canadian villages via ATS-6 satellites and this practise since 2002 has been continued to help the people living in these areas. ² In 2005 this facility was used to provide relief to the affectees of earthquake in Muzaffarabad in Pakistan, Where telemedicine centers were created. ^{3,4}The Telemedicine assets and capabilities were applied in this disaster in managing all the injured patients. Doarn et al has also discussed the role of satellite tele medicine in managing Mexico City earth quake in 1998. ⁵ Gul S et al reported in 2008 on their work using telemedicine and paraplegic rehabilitation at a hospital in Rawalpindi Paki. ⁶ They have discussed how this modality helped rehabilitating 194 patients in Rawalpindi. In 2011 Dr Ronald Weinstein⁷ reviewed a from Dr Riffat Latifi entitled " telemedicine for trauma emergencies and disaster management". ⁷ In their article they highlighted telemedicine as a tool for teaching and implementing telemedicine in support of disaster response. Alverson et al prepared a summary report on tele health tools for public health, emergency, or disaster preparedness and responses. ⁸

This method of treating patients enables us to give patients in remote locations better services at lower cost. It saves one or two journeys of the patients to the main hospital from a tertiary hospital for a pre-admission appointment and also saves the patient a lot of time which is lost is travelling.

Patients and Methods

This study was conducted in Holy Family Hospital in teleconference unit located is surgical Unit II. A total of 195 ENT clinics were conducted between July 2008 to March 2012 in which consultations were facilitated for two thousand one hundred and fifty nine patients in Tehsil head Quarter hospital Pindi Gheb, DHQ Hospital Attock, Gujrat and DI Khan. From July 2008 to March 2012 patients of all ages and gender from remote area centers were included in our study.

Weekly 2 hour video conferencing in telemedicine center of Holy Family Hospital was done. The tools used were videotoscope for ear examination, and video endoscope with tongue depressor for oral cavity examination (Figure 1-3). Real time images and downloaded file were used to assess the patients. ENT consultants were present at HUB and trained nurse, doctor and IT expert at remote areas. Tele ENT co-ordinator was present in both areas. The data of patients scheduled for clinics was uploaded on server and became available to the specialist. This data included the name, age, sex, and out patient department reference number along with brief history in a few words and any investigation that had been advised. A band width of 384 kbs was available for transmission of images and video conferencing provided by PAKSAT satellite and Wateen Telecom Wimax services. ENT consultants conducted on weekly clinic .Using Telemedicine and Audiovisual equipment full history and ENT examination was performed. The consultant specialist examined the patients through video conferencing and correlated the clinical findings with related investigations ,like X-Ray PNS45,X-Ray mastoid oblique views ,soft tissue neck ,blood test (complete picture, BT, PT, blood grouping) were other test conducted. Only some method of picture delay was encountered as we examined the patients. : An effort was made to reach out and provide specialist service in this field to patients in remote rural areas devoid of facilities and trained personnel. As in any well equipped tertiary hospital the facilities and consultations were extended and full measures were taken to provide adequate managements to these patients.

This programme is a part of Pakistan Ministry of Information technology rural support program. These centre capabilities were further enhanced by US state department support. Video conferencing is an effective tool and method of assessing and treating ENT conditions and for screening potential surgical admission. Some patients were booked for surgery and ordered base line investigations .Patients with nasal and laryngeal problems were mostly advised to visit Holy Family Hospital. For better and faster services patients who were given time for surgery got their investigations done in their home town and were admitted straight away as they arrived in Holy Family Hospital. These patients were put on the next immediate operating list and was success fully operated and followed up for weeks using this modality. Investigations conducted for routine workup were complete blood picture , bleeding profile

investigations as mentioned previously, profile for hepatitis A and B, ECG and chest X-RAY for elderly. Diagnosis and management plan formulated was recorded. In follow up repeat history and examination was done, plan for future consultation and on going management was recorded. Review was also done of our referrals to other departments.



Figure 1: Digital otoscope :patient being examined by digital otoscope



Figure 2: Videoscopic Oropharyngoscope



Figure 3: TELE ENT consultations inHFH Prof Ron Merell(pioneer inTELE ENT in america) from america sitting with ENT consultant



Figure 4: USAID Recognition of Tele ENT in Holy family Hospital

Results

A total of 195 ENT surgical clinics were performed in these Tele ENT sessions. A total of two thousand one hundred and fifty nine patients were included in our study. Majority of our patients had ear and throat problems (Table 1). More than one thousand two hundred and eighty seven patients (1287) were managed conservatively on site by video conferencing and were followed up on out patient basis. A total of (792) seven ninety two patients were referred to us and admissions were arranged in Holy Family Hospital for six sixty one (661) patients requiring surgery. Most patients three hundred and fifty (350) of them were followed up on video conferencing and one hundred and nine (109) patients came for a follow up in holy family hospital. Out of 950 patients that presented with ear complaints the major complain

was ear discharge associated with deafness (45%) (Table 2). In throat the major complain was of chronic sore throat (58%) (Table 3). In nasal problems nasal obstruction (58%) was the commonest (Table 4). The major operation done was tonsillectomy 50% (331) (Table 5). We conducted (19) 2.9% of endoscopies, (laryngoscopies and bronchoscopies), 3.5% of myringoplasties and (11) 1.7% radical mastoidectomies. A few emergency cases were also dealt like foreign body nose and foreign body removal from esophagus and larynx and bronchus. (12) 1.9%, removal of tonsolith (5) .8%, and drainage of peritonsillar abscess, mastoid abscess, tracheostomies and even (Table 5). The follow up period was for one year. Out of six sixty one (661) of operated patient four hundred and fifty nine (459) were followed up post operatively. Three hundred and fifty (350) were followed up through video conferencing and the remaining one hundred and nine (109) patients were followed up in Holy Family Hospital.

Table 1. Percentage of Ear Nose and Throat patients

Disease	%age
Ear	45
Throat	42
Nose	13

Table 2. Tele ENT- Ear Symptoms

Ear symptoms	%age
Ear deafness and discharge	45 %
Blockage of ear	38 %
Earache	9 %
Vertigo	6 %

Table 3 . Tele ENT- Throat symptoms

Throat symptoms	%age
Chronic sore throat	60 %
Acute sore throat	20 %
Dysphagia	11 %
Hoarseness of voice	7 %
Swelling in neck	2 %

Table 4-Tele ENT- Nasal Symptoms

Nasal symptoms	%age
Nasal obstruction	58
Epistaxis	15
Nasal discharge	13.8
Mass/foreignbody	12

Table 5. Tele ENT-Surgical services provided

Surgical service	%atage
Tonsillectomy	50
Wax removal	23
SMR	20
Fracture Nasal Bone	4.4
Endoscopies	3.1
Radical Mastoidectomies	1.7
Myringoplasties	0.5

Discussion

Telemedicine offers a unique opportunity for the delivery of health care to rural communities. Telemedicine center Attock is one of the spokes connected to Holy Family Hospital hub. This center capabilities have been further enhanced and upgraded by US State department. Through this modality we have extended specialist services to catchment area of Rawalpindi teaching hospitals. A lot of fields including ENT (emergency and normal clinic patients) have been attended in far off areas where there are limited health, staff and technical facilities.⁷

Real time medicine as a means of gaining expert advices has gained fast recognition as a visible alternative to traditional referral system. Bashshur L Rashid in his book "History of Telemedicine" has described the complex interrelationship between patients, policy and technology. In this book the rules of telemedicine scholarship are mentioned and the author has created a feeling that telemedicine is not simply an enabling technology, but more of an umbilical cord of health information.⁹

The video endoscopic quality of otorhinological images that we obtained were of high resolution and quality for us to make the diagnosis. The management plan that we decided for the patient matched the management plan that we made as we saw some of the patients in our OPD or emergency when we admitted the patient in our ward for any surgical intervention. Sir Pederson.¹⁰ S et al in his tele endoscopic pilot study has mentioned that " although the video imaging is compressed before transmission over the telecommunication network our results show us that the quality of transmitted images were equivalent to the quality of images from a standard endoscopic examination"

This clearly supports the fact that real time images not only help in making the correct diagnosis but also helps the specialist doctor in making accurate and precise management plan for patient. Smith et al showed among the 68 patients seen via the videoconferencing and in person, the recorded diagnosis was the same in 99% of the cases.¹¹

The drawback that we faced in our study was delay of some seconds in receiving the picture otherwise the data and picture quality was excellent. Our majority of patients were from Attock which comprises of six tehsils and has an estimated population of 1.8 million. Attock is eighty (80) km from the capital Islamabad and its DHQ at the time of our study did not cater for ENT patients as no specialist services were available there. Still there is just one ENT medical officer

available in that hospital the specialist services are lacking. Patients with their problems had to travel a long distance, arrange for their boarding and lodging and were on and off referred to hospitals in Islamabad and Rawalpindi. This practiced has changed since we established a tele medicine center in Attock. According to a survey conducted by WHO¹², no national telemedicine and e-health policy frameworks have been designed in Pakistan in contrast to which 55% states world wide have a proper e- health policy designed. But this Rural Support Programme especially in the field of TELEENT has been acknowledged and praised by one of the washigton journal (Figure 4).¹³

Conclusion

1. Through Tele ENT it is possible to reach out and provide specialist services to patients in far remote areas devoid of specialist ENT staff and equipment.
2. Utility of Tele medicine needs proper appraisal at higher levels

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