QUALITY MEDICAL SERVICE IN GOLDEN HOURS - 24/7
FOR RURAL INDIAN POPULATION VIA TELEMEDICINE
“A PUBLIC HEALTH INITIATIVE”

Dr Ramesh Babu Pothineni MD., DM.

ABSTRACT
Ramesh Hospitals launched Telemedicine services to provide quality medical service in Golden hours for the needy rural population. It established a Hub in the main Hospital at Vijayawada with 10 spokes in the coastal districts of Andhra Pradesh. Each spoke is equipped with a spoke room and has a Telemedicine workstation. There were 1285 Tele consultations and 1536 wireless ECGs were transmitted. There were 434 admissions. 216 patients had Acute Myocardial infarction; 74 patients were thrombolysed, 58 patients underwent Primary Coronary Intervention. Elective coronary angiograms were done in 178 patients; 44 underwent PTCA, 23 underwent CABG. 9 patients had Brain stroke and CT scan was done in 33 patients. 418 patients were discharged in stable condition while 16 patients died.

KEYWORDS: telemedicine, telecardiology, teleneurology, golden hours, hub spokes

INTRODUCTION

Nearly one million Indians die every year due to inadequate healthcare facilities and 700 million people have no access to specialist care. As 80% of specialists live in urban areas, we felt that a specialist should be accessible to the rural population 24 x 7 via Telemedicine. As an innovator in the field of Cardiology, Cardiothoracic Surgery and Neurology for 25 yrs, Ramesh Hospitals growth had been steady since 1988, from its first cardiac center in coastal Andhra to the inauguration of Telemedicine centers from January 2013 onwards in a Hub and Spoke model. Ramesh Hospitals firmly believes Telemedicine is the only medium where Medicine can be practiced at patient’s door step reaching the last meter, saving lives, time and money.

PURPOSE

The purpose of innovation was to provide Tertiary care 24/7 to the rural needy people as doctor to patient ratio is alarmingly low. This is due to non availability of primary care physicians and paramedical staff in rural India especially from 8 PM to 8 AM the next day. For example, a case of Epistaxis in a child can be managed by a simple advice by a Tele consultant to the mother by applying pressure and pinching the nose of the child in erect position and verbal ordering medication
thus preventing aspiration of blood into the lungs causing dyspnoea, collapse of lung which may lead to Respiratory arrest. A case of chest pain with burning sensation can be due to Gastritis or Acute Myocardial infarction which may lead to misdiagnosis and denial of treatment in the Golden hours. Timely detection of three signs (FAST) in a case of brain stroke facilitates early diagnosis and treatment can reduce mortality, morbidity and permanent disability. Early detection, diagnosis & treatment can only be achieved with good Telemedicine equipment and connectivity. As our main Hub is a Super Specialty Hospital, Teleconsultations are provided 24/7 to attend any call from our spokes or Primary Heart & brain stroke Telemedicine centers. Ramesh Hospitals since 25 yrs was very innovative in upgrading its inventory and man power with changing times. As Telemedicine is a new born baby in the field of medicine we are striving to take this forward by making quality medical care accessible to those in need of a specialist advice be it a primary care physician or a patient for early initiation of medication in case of Acute myocardial infarction (ACMI) or brain stroke.

MATERIALS

We have four spoke centers of our own and six centers in partnership. Developing spoke partners, creating service agreements, understanding licensure and privileging, and meeting with the appropriate stakeholders for information dissemination, education, training as appropriate will be important in the development of a robust network.

A stroke room with 20 x 20 x 10 sq ft, two emergency beds and two recovery beds would be ideal for smooth functioning at spoke centers. Telemedicine work station for Tele consultation with 1 KVA UPS, DUAL CORE 2.7 CPU with 22 inch LED monitor is in place with Microsoft life cam studio 1080p HD webcam, creative SBS A35 desktop speakers and earphones. All in one printer (print /scan /copy) facilitates recording. Connectivity is via Broad band internet through FTTH Technology and DWL – 3200 AP802.11G indoor Wireless access point + POE (business class) + WIFI dongle. At our main Hub we have up load and down load speed of 20 Mbps and at spoke centers we have an upload speed of 4 Mbps and down load speed of 10 Mbps.

We have a fully equipped crash cart with Defibrillator, Intubation kit and emergency drugs. A wireless ECG machine, Uno R10 sim enabled plus with a USB port of transmission via on line is also available. As we have primary care physicians at all our spokes we are not using Digital stethoscope and digital pen. Each spoke center is equipped with a Laboratory, Pharmacy and a X-RAY unit. Necessary medicines for Thrombolysis are available 24 X 7. An ambulance is available to shift patients to the main HUB after teleconsultation for tertiary care and concerned teams are alerted in main HUB or our Tertiary care center. Patient is monitored in a well equipped ambulance and all vitals and incidents documented during transit.
METHODS

Over a period of 25 years, we placed 12 ECG machines at each mandal head quarters in the year 2000. In 2013, we introduced wireless ECG machines and started 10 Primary heart and brain stroke Telemedicine centers with good audio & video connectivity. Awareness programs, basic life support programs and free camps were conducted for local people in each spoke center to promote Telemedicine. CME programs were conducted for Local Doctors regarding stroke and Acute Myocardial Infarction and the importance of initiating thrombolytic therapy in the golden hours was stressed.

Initial assessment and Triage is done by Primary care physician at Primary Heart and brain stroke Telemedicine centers or spokes. Standard operating procedures are followed. Telemedicine consent form is taken for each Telemedicine consultation. History is documented. National Institute of Health Stroke Scale is followed (NIHSS) in case of a brain stroke. CT scan and blood investigations are ordered after a consultation with the Neurologist. Inj (rt –PA) is available for IV thrombolysis after ruling out Hemorrhage and thorough history and ordered via Telemedicine.

Protocols and approach to a patient of acute coronary syndrome (ACS), ST elevation myocardial infarction (STEMI) are clearly defined and followed at Primary Heart and Brain stroke Telemedicine centers. Wireless ECG is transmitted in a cardiac case immediately for consultation through a smart phone of a Cardiologist and medication is ordered. The improved patient Triage could potentially improve patient outcomes by decreasing “door to needle Time”.

Tele consultations are given for Post operative patients by a cardiac Surgeon for wound management and dose adjustment of oral anticoagulants after PT & INR test. Diabetic and cardiac patients take Tele consultations with prior appointments at fixed time from Primary Heart and brain stroke Telemedicine centers. Counselling is imparted by a physiotherapist and dietician.

RESULTS

Ever since establishing ten Telemedicine centers since January 2013 across coastal districts of Andhra Pradesh (Krishna, East and West Godavari, Guntur, Prakasam and Nalgonda), the growth had been steady. Lack of awareness is a factor to be looked into. Though awareness programs in Heart and Brain stroke, basic life support training programs, free medical camps for local people, CME programs for local Doctors in each spoke center to promote Telemedicine, support from local Doctors is essential in promoting Telemedicine.

Tele consultations were predominantly in cardiology. There were fifteen hundred (1500) telephonic enquires and advise was given over phone. One thousand two hundred and eighty five teleconsultations (1285) were given via audio/video conference. Total admissions after teleconsultations were four hundred and thirty four (434). One thousand five hundred thirty six
wireless ECGs (1536) were transmitted from spoke centers for Tele consultation from cardiologists. Two hundred and sixteen (216) cases were Acute Myocardial Infarction (MI) of which seventy four (74) patients were Thrombolysed as they were in window period. Fifty eight (58) patients underwent Primary coronary Intervention (PCI) in the Golden hours. One seventy nine patients underwent Elective coronary angiogram (179). Forty four (44) patients underwent PTCA. CT coronary angiograms were 42. Twenty three (23) patients underwent elective Coronary Artery Bypass grafting. Nine (9) patients had brain stroke. CT brain was done in thirty three (33) patients. Four hundred and eighteen patients (418) were discharged in a stable condition while 16 patients died.

Case 1

Forty one year old male businessman presented with dull aching epigastric pain on /off since one month. Symptoms worsened on 30th January 2014 morning. He visited our Repalle Telemedicine center immediately. Wireless E.C.G was transmitted to our main Hub, diagnosed as Inferior wall MI, oral anticoagulants were initiated and shifted to our Main Hub at Vijayawada on same day. Echo revealed basal / mid / inferior segments Hypokineti, fair LV systolic function. He shifted to cath lab immediately. Coronary angiogram revealed Double vessel disease. Primary PCI to RCA was done and 2.75 x 15 mm Xience v stent (DES) was deployed. Door to balloon time is 86 minutes. Post procedure period was uneventful. He was treated with GP II b/III Inhibitors, antiplatelets, ACE inhibitors, Nitrates and other supportive medications. Patient was discharged in a stable condition with an advice for elective PCI to LAD and continuing medications.

Case 2

A 72 year old lady, a known case of hypertension developed acute onset right sided weakness of 4 hours duration. The doctor at the spoke had a teleconsultation with the neurologist, who after examining the patient, prescribed antiplatelet agents, statins and antihypertensives with supportive care. Relevant investigations including CT scan of head were advised. A CT scan of head done the next day confirmed the ischemic stroke. She made a good recovery.

CONCLUSION:

A Telemedicine network can improve access to patients in rural areas in Golden Hours. The use of an ongoing quality reporting program is essential to the long term success of this care delivery model. Engagement by Primary care physicians and nurses, along with ongoing communication, data analysis and feedback, along with input from partner sites is key to sustainability of a program that brings quality stroke expertise to patients, regardless of where they present
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7. Approach to STEMI and NSTEMI – Lal C Daga¹, Upendra Kaul², Aijaz Mansoor³.


www.heart.org/cpr
AUTHORS BIOGRAPHY:

Dr. Ramesh Babu Pothineni was born in Denduluru, west Godavari district in the year 1957. He completed his M.B.B.S in 1980 from Guntur medical college, Guntur district, Andhra Pradesh, India. In 1981, he secured 1st place in Andhra Pradesh Post graduate Medical entrance examination and was selected simultaneously at AIIMS New Delhi and PGI Chandigarh for M.D Internal medicine. In 1982 – 84 he worked as Junior Resident in Internal medicine at AIIMS New Delhi. He completed M.D in 1984. In 1985 he secured the 1st place in D.M entrance examination conducted at National level in AIIMS, New Delhi. He completed Senior Residency in Cardiology in 1988 at AIIMS, New Delhi.

In 1988, he started first Cardiac center ICCU with 6 beds in Vijayawada, Andhra Pradesh. In 1996 he conducted first Balloon Angioplasty in coastal Andhra Pradesh. In 1996 started the Cardiothoracic unit and in 2011 launched the first 256 slice CT scan. He completed more than 38756 Angiogram procedures including 5499 PCIs in Dr. Ramesh Cardiac & Multi Speciality Hospital Ltd., Vijayawada. He conducted around 525 primary PCI’s as primary operator with results at par with best institutions across the globe. He conducted more than 250 free heart check up camps in coastal A.P. and free Cardiac Clinic on every 2nd Sunday of the month at Dr. Ramesh Cardiac & Multi Specialty Hospital Ltd., He established 12 computerized ECG machines for Rs.20/ per ECG at each mandal head quarters for early detection on Heart Diseases. He launched Primary Heart & brain stroke Telemedicine centers in the year 2013. He Published and presented ten papers on different topics in Cardiology at National Conferences, and published five papers in international journals.

Dr. K Sharan Cardiology Excellence Award for the year 2011-2012 was bestowed upon him on 26th December, 2012 at the annual Conference of Indian Medical Association held at Kanyakumari in Tamilnadu. This award consists of a citation certificate and cash reward of Rs.50,000/. This national award is given annually for the Cardiologist or Cardiac surgeon, who renders service with proficiency and involves in research activities.

He participated in the following international clinical research trials approved FDA since 2004:
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Dr Ramesh Babu Pothineni by augmenting staff, expanding service matrix, enlarging the gamut of operations has made Ramesh Hospitals, the chosen destination for people near and far for quality Cardiac care across Coastal districts of Andhra Pradesh.

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How we created a network?

Each telemedicine center is linked to the Hub through FTTH or high-speed broadband internet connectivity.

Network Hospitals Model
Sample Process Flow

PRIMARY CARE CENTRE

MOBILE ECG DEVICE WITH GPRS/3G

HOME

TERTIARY CARE

First Aid Therapy

Yes

No

HOME

Expert Opinion