

Telemedicine Assistance for Cardiac Patients in Egypt during COVID-19 Pandemic

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Abstract

Introduction; during the 2019 novel coronavirus (COVID-19) period, most of the countries were locked down and most of the hospitals established for COVID-19 patients only. The idea of telemedicine and online clinic was necessary and a good solution for patients who cannot reach or afraid from contacting corona virus carriers at cardiology clinics or hospitals.

Aim of work; this study was conducted to assess the value of telemedicine in cardiac patients care and ease managing their chronic illness during COVID-19.

Subject and Methods; A cross sectional study during the course of one month of tele monitoring (from 5 July to 4 August), we received 2003 alerts (phone calls and messages). We used to communicate with patients on time or shortly within 24 hours according to their complaints.

Results; As regard onset of complaint, 14.4% were acute onset and 85.6% were gradual onset. Recommendation for admission for only 15.1% and 84.9% of patients advised to continue treatment at home with some changes in doses.

Conclusion ; Telemedicine had a lot of economic and social benefits and it is a good solution especially in certain circumstances like the COVID-19 outbreak. It allows better follow-up, stimulation of self-management of the illness, improvement of quality of life, reduction of rehospitalization costs, and faster treatment in cardiac emergencies.

Keywords; Telemedicine, COVID-19, cardiac patients

Receive Date : 27/8/2021	Accept Date: 28/8/2021	Publish Date : 1/9/2021
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Introduction

The Era of Telemedicine started to appear in the mid - 1990s for elderly cardiac patients under the term of Geron-technology to assess and care for elderly cardiac patients at home or when clinical examination of patients is difficult. Cardiovascular diseases are associated with high morbidity and mortality rates, as well as hospital admission. About 50% of cardiac patients need re-hospitalization within six months of diagnosis. (1)

During the 2019 novel coronavirus (COVID-19) period, most of the countries were locked down and most of the hospitals established for COVID-19 patients only. The idea of telemedicine and online clinic was necessary and a good solution for patients who cannot reach or afraid from contacting corona virus carriers at cardiology clinics or hospitals.

We established an online clinic and WhatsApp line for cardiac teleconsultation and tele monitoring from all over Egypt. No doubt that the development of information and communication technologies had a cornerstone in telemedicine generally and especially in this work (Tele cardiology).

Aim of work

To assess the value of telemedicine in cardiac patients care and ease managing their chronic illness during COVID-19. More, helping those patients who need a rapid advice about their cardiac condition and whether telemedicine will reduce their visits to hospitals?

Patients and Methods

A cross sectional study during the course of one month of tele monitoring (from 5 July to 4 August), we received 2003 alerts (phone calls and messages). We used to communicate with patients on time or shortly within 24 hours according to their complaints.

Ethical consideration

The study was approved by the Ethical Committee and the Egyptian doctor's syndicate.

Statistical analysis

Data collected throughout demographic data, medical history, complaint, and diagnosis. Then coded, entered, and analyzed using Microsoft Excel software. The data collected were tabulated and analyzed by SPSS (statistical package for social science) version 20 (Armonk, NY: IBM Corp) on IBM compatible computer. The data were tested for normality using Kolmogorov–Smirnov test, Shapiro–Wilk tests.

Descriptive statistics was done:

-According to the type of data qualitative represented as number and percentage, quantitative continues group represented by mean \pm SD

Results

Over one month of tele monitoring (from 5 July to 4 August 2020) we received 2003 alerts (phone calls and messages). 55% of patients were females and 67.8% were nonsmokers.

Diabetic (DM) constituted 35% of patients and 40% were hypertensive. Heart failure (HF) patients were 19.9% while ischemic heart disease (IHD) represents 35% and those with drug-eluting stent (DES) about 20%. Rheumatic heart disease (RHD) patients represent 10.1% and 7.1% of patients were on anticoagulants. Arrhythmias represent 15.1% of patients and some patients had associations of more than one disease. Table(1)

Table (1): Sociodemographic characteristics of the study participants.

Characteristics	
Age	Mean± SD 47.73±14.84
Gender	N (%)
Male	901 (45%)
Female	1102 (55%)
Smoking state	N (%)
Smoker	644 (32.2%)
Non Smoker	1359 (67.8%)
Type of call	N (%)
Phone call	1500 (74.9%)
Message	503 (25.1%)
Underlying disease	N (%)
DM	701 (35%)
Hypertension	802 (40%)
HF	400 (19.9%)
IHD	701 (35%)
DES	401 (20%)
RHD	202 (10.1%)
Anticoagulant	142 (7.1%)
Arrhythmia	302 (15.1%)
Recent complaint	N (%)
Chest pain	502 (25%)
Dyspnea	600 (30%)
Palpitation	202 (10.1%)
Follow up	699 (34.9%)
Onset	N (%)
Acute	288 (14.4%)
Gradual	1715 (85.6%)
Severity	N (%)
Mild	1002 (50%)
Moderate	701 (35%)
Severe	300 (15%)
Referral	N (%)
Yes	302 (15.1%)
No	1701 (84.9%)
Total	2003

As regard patient’s complaints, 25% were complaining of chest pain while 30% in the form of dyspnea. Palpitation represents about 10.1% and 34.9% for follow up of blood pressure, heart failure and blood sugar. Figure (1)

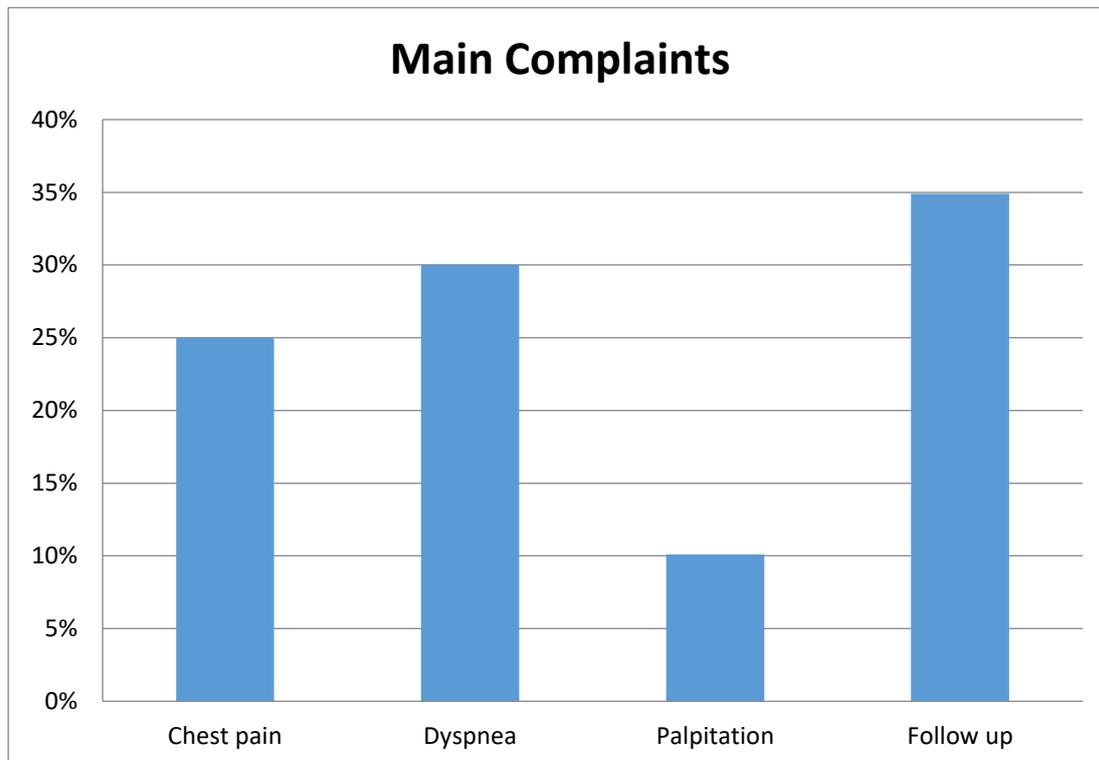


Figure (1): Main types of patients' complaints.

As regard patients with heart failure, 20% suffered an increase in the grade of dyspnea, 19% of new onset edema of lower limbs and only 10% of increase in the level of previous lower limbs edema. 31% of patients of heart failure suffered exertional palpitation and 7% suffered fever and cough. Blood sugar and blood pressure control were asked from 13% of patients. Assurance was sufficient in 40% of patients, increase in the diuretic dose in 30%. Admission was incremental in 10% of patients for heart failure management and 3 % for COVID-19 suspected infection.

Chest pain was nonspecific (not typical for angina diagnosis) in 80% of calls and only 20% was referred for urgent ECG inside the hospital where only 10 % represented as myocardial infarction or unstable angina required hospitalization.

As regard onset of complaint, 14.4% were acute onset and 85.6% were gradual onset.

Recommendation for admission for only 15.1% and 84.9% of patients advised to continue treatment at home with some changes in doses. Figure (2)

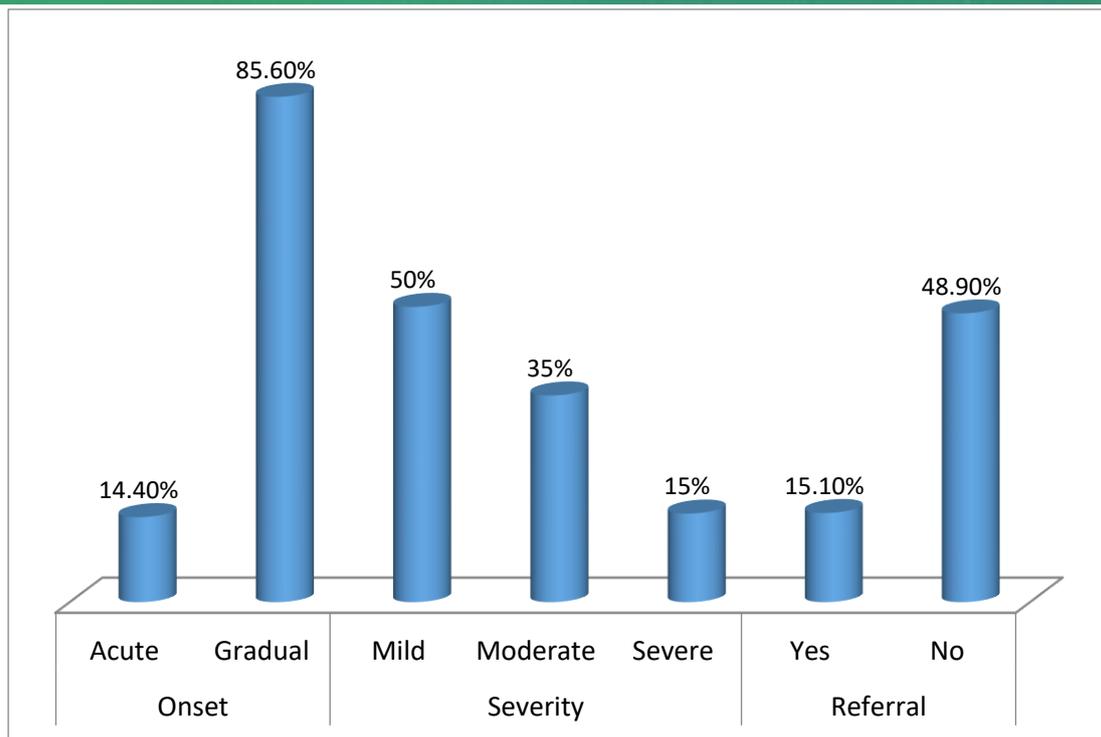


Figure (2): Analysis of patients' complaints.

Discussion

During the course of one month of tele monitoring, we received 2003 alerts (phone calls and messages). 55% of patients were females and 45% males. About 67.8% were nonsmoker. DM patients constituted 35% of patients and 40% were hypertensive. HF patients were 19.9% while IHD represents 35% and those with DES about 20%.

RHD patients represent 10.1% and 7.1% of patients on anticoagulants. Arrhythmias represent 15.1% of patients and some patients had associations of more than one disease.

Self-blood-pressure (BP) monitoring is acknowledged to play an essential role in the prevention and treatment of hypertension, with benefits both for clinical outcomes and for therapy optimization. (2) In the current study around 35% of patients with heart failure were supported by telemedicine in controlling their blood pressure and sugar using home monitoring. On the other hand the SEDIC study from France's (Basse-Normandie region) studied the possibility of a telemedicine program for home monitoring beginning in 2007 for three months in elderly patients over 65 years who

admitted with acute heart failure with two arms one for conventional treatment and another for tele monitoring resulting in no differences between two groups as regard number of days in hospital admission. (3)

A study by Dary P aimed to evaluate the idea of optimizing treatments by tele monitoring as a possible alternative to hospitalization. Tele monitoring aimed to follow up on the treatment according to the results of measured parameters. The results were weight loss of 2 kg ($p < 0.0001$), with an increase of 50% in diuretic dosages. In comparison with our current results only 30% of patients required increasing the dose of diuretics. Edema and weight were good predictors for hospitalization. The blood pressure decrease was 6 mm Hg for systolic pressure ($p = 0.002$) and 7 mm Hg for diastolic pressure ($p < 0.0001$), allowing to modulate antihypertensive therapy. The heart rate changes from 87 to 73 bpm ($p < 0.0001$), which is significant in cases of atrial fibrillation. Another benefit was an alternative to hospitalization for 31 patients (37%).

(4) The SETAM (Strategy of Early Detection and Active Management of Supraventricular Arrhythmia with Telecardiology) to evaluate telemedicine in rhythmology. It showed that telemedicine resulted in early detection of events, with a decrease in hospitalization by 66% related to atrial arrhythmias and stroke prevention. (5). As regard admission for heart failure or myocardial infarction a similar result was obtained in our study, suggested that by the help of telemedicine only 15 % of patients required hospitalization.

Impact on daily practice

Telemedicine had a lot of economic and social benefits and it is a good solution especially in certain circumstances like the COVID-19 outbreak. It allows better follow-up, stimulation of self-management of the illness, improvement of quality of life, reduction of rehospitalization costs, and faster treatment in cardiac emergencies.

We recommend the widespread use of telemedicine in other diseases like DM, chronic obstructive pulmonary disease [COPD], liver and renal diseases.

We take into consideration that a lot of barriers to establishing telehealth, as many health systems are not yet ready for these technologies to deal with present information systems.

Limitations and recommendations

Exact follow up of blood pressure measurements, weight and blood sugar were not carried out in the current study. Further more detailed and disease specific researches for telemedicine benefits should be encountered.

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