CHF HOMONOTORING SYSTEM USING LAB-VIEW

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ABSTRACT:

The chronic heart failure (CHF) is one of the fastest growing diseases in India. The heart failures rate is increasing rapidly in today's fast day to day life. The Indian elder population is facing it most of the times. Researchers are working hard to minimize the charges for the treatment in heart failure conditions. The need of the time is to develop the out of hospital system or home system to monitor the condition of the patient continuously so that better care will be taken and better medical treatment will be provided. The patients of the heart failure needs close attention and continuous monitoring. The patient requires the special diet, medicines and an environment to get cured from the disease. Authors have discusses about the system which continuously observe and store the information of the patients health. This information will be available for the hospitals and doctors to understand about the condition of the patient with the help of GPS system. The use of GPS system is extended to call or message to the doctor/caretaker in case of any emergency.

KEYWORDS: heart failure, home monitoring, remote monitoring, disease management.

1. INTRODUCTION

Around 15 million people in India are suffering from chronic heart failure (CHF). The developing countries are continuously promoting the industries and it is observed that the heart failure rate is more in the developing countries that the other countries. By considering the severity of the disease we can understand that the expenses for hospitalization and treatment are very costly for this disease. The percentage of the patients observed will be increasing with the increase in the age of human being. If we consider the current situation over last ten years, most of the people will hospitalized and have got severe stroke after discharge from the hospital. Once the patient is discharges, he/she may have less contact with the doctor. Indians are having the tendency that, unless and until some health issue arrived, they will avoid meeting the doctor for general health checkup. Once people are cured from the disease they are least bother about the re-arrival of the same health issue and hence there is a need of the system which can monitor human health at home. The previous researchers have proven the chances of re-arrival of the heart failure are about 45% once cured. While its necessary to have monitoring system. An unique monitoring system was developed by using MSP430G2552 microcontroller.

The project module uses a portable sensor module which is placed in the patient's body (finger). This method is very much useful for patients who are prone to heart failures. Our module is useful for patients even when they are in some other places other than hospital. It gives immediate indication of low and high blood pressure rates and heart rates beyond certain limits to the patients as well as to the Hospital Information System. Transmitter and receivers are used in most of the recent heart rate monitors. In early plastic straps, either water or liquid was required to get good performance. Blood pressure rate is supervised by a pressure sensor which consists of testing belt. Many diagnostic and therapeutic devices incorporate pressure sensors made with Piezo-resistive semiconductor technology. The pulse rate and blood pressure are transferred to the Hospital Information System by using Lab VIEW technology. Admission to hospital with heart failure has more than doubled in the last 20 years, and it is expected that CHF patients will double in 2030. Heart failure hospitalizations are found around 2 percent of the total hospitalizations. The CHF management accounts for 2% of the total healthcare expenditure, and hospitalizations represent more than two thirds of such expenditure. The current healthcare model is mostly in-hospital based and consists of periodic visits. Previous studies pointed out that in patients with a discharge diagnosis of heart failure, the probability of a readmission in the following 30 days is about 0.25, with the readmission rate that approaches 45% within 6 months 2].

LITERATURE SURVEY:

This paper presents the development of a system for ECG monitoring and alarm system. The system is intended for home use by patients that are not in a critical condition but need to be constant or periodically

monitored by clinicians or family. Patient monitoring is the cornerstone of proper medical care. It provides clinicians the much needed information about a person's current health status, so that they can act accordingly if anything goes wrong. Nowadays, complex patient monitoring systems offer the possibility of continuously monitoring a multitude of biological signals, analyze them, interpret them and take the appropriate action; or alert clinicians if necessary. The usual shortcomings of most of these systems reside in affecting patient mobility and home comfort. A patient would need to be sitting on a bed wired to these devices in order for his vital signs to be monitored. This system measures, records and presents in real-time the electrical activity of the heart while preserving comfort of the patient. The device is built as a low-power, small-sized, low-cost solution suitable for monitoring elderly people at home or in a nursing facility without interfering with the daily activity of a patient. It should give sufficient information in real time, and make it available remotely [1].

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SYSTEM DEVELOPMENT:
The proposed system is to monitor CHF patient vital parameter on Labview software on computer screen. This work introduces a novel based heart rate, temperature and ECG monitoring system.MSP 430G2552 microcontroller is used in this project. The project module uses a portable sensor which is placed in the patient's body (finger).This method is useful to patients when they are in some other places other than the hospital. It gives immediate indication of heart rate beyond a certain limits and temperature beyond a certain limit to the patients and to the hospital management system values are displayed in the LCD. The values are transmitted to the remote system via Bluetooth and then it is transmitted to the hospital so that doctors can take timely action when necessary
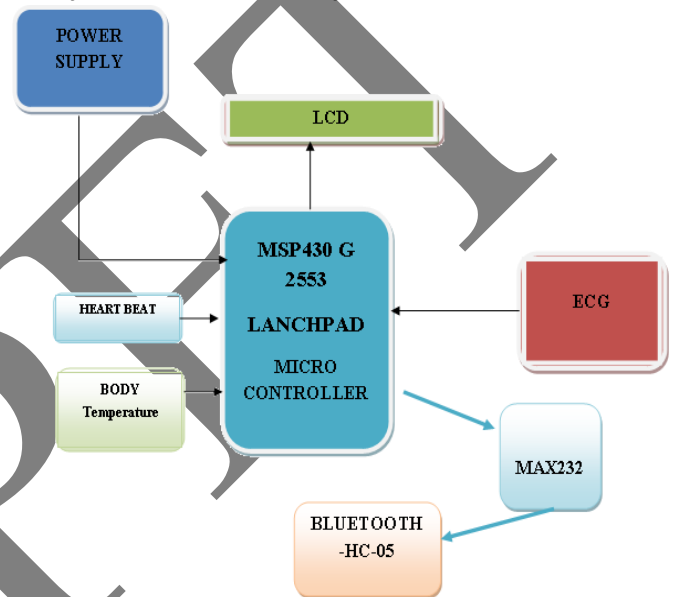

Fig.1: System Block diagram

Various attributes
1. TESTING OF ECG SENSOR:
The ECG sensor used to record the changes in the heart beat such as the electrical activity generated by heart muscle depolarization, which propagate in pulsating electrical waves towards the skin.

2. TEMPERATURE SENSOR:
LM35 is used to sense the temperature. The LM 35 sensor sensed the changes in temperature in proportion with the voltage.

3. BLUETOOTH HC 05:
Bluetooth acts as mediator between the Microcontroller and Labview Software .The output of microcontroller which are the readings of Temperature, Heart-beat, ECG are given to the LABVIEW which shoes the graphical reading.

2. LAB VIEW:
It is use3d for the graphical view of the heart beats and is easy to understand to a non -technical person.

RELEVANCE OF PROJECT:

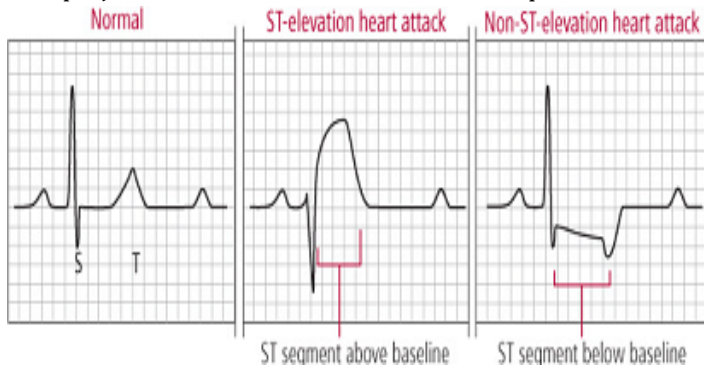This project can be used for CHF Heart failure patient

Fig 2 ECG Signal

RESULT ANALYSES:

In this project named Chronic heart failure monitoring system .The heart rate of a patient is detected and taken by the heart beat sensor which will give its output to the op amp as the amplitude of the signal is small so the op amp will increase its amplitude which will be processed by the microcontroller. Microcontroller will initially convert this signal in the digital form and process it the output of the micro controller is given to the Lab view software which will showcase the output of the patients heart beat in the graphically form. In the same way the ECG and the temperature view is also given and for sensing the temperature LM35 is used as a sensor in the circuit. By the graphical view of these parameters the doctors detect the stage of the patient and the severity of the patient's heart attack whether it is first stage or more. The stages are checked in the following manner. In ,electrocardiography the PR interval is the period, measured in milliseconds, that extends from the beginning of the P wave (the onset a trial depolarization) until the beginning of the QRS complex (the onset of ventricular depolarization); it is normally between 120 and 200ms in duration. If a Q wave is measured by ,EKG the PR interval is sometimes termed the PQ interval.

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