Smart Mobile System for Pregnancy Care Using Body Sensors

Prasath Surendhar S, Besia Baby, Jesna S

Abstract: ***In the recent years, child bearing has become more complex when compared to olden days. Women are at a risk of various biological changes that happens at the onset of pregnancy. In some complicated issues it's necessary to have a monitoring device that helps in proper diagnosis of the patient. With the development of Internet of Things can make all objects interconnected and it is recognized as the next technical revolution. Internet of things is used in smart homes, smart parking, smart environment, smart city and industrial areas. Internet of Things has a wide range of applications like patient data acquiring and monitoring. This can also be stored in data format where patient's parameters get transmitted through medical devices via a gateway. Thus, Internet of Things is a highly effective component in medical field because of its cheap cost and accessibility to wide range of environments. This project relies on monitoring of patient's body temperature, respiration rate, heart beat and body movement using Arduino UNO.***

Index Terms: **Technical revolution, patient's parameters, healthcare applications, Arduino UNO, respiration rate**

I. INTRODUCTION

There has been a tremendous risk factors related to conceiving and pregnancy cases. Therefore, for normal child bearing many things has to be taken care. Not all pregnancies go to plan. Pregnancies can be a time of excitement and anticipation but some women may also experience complications such as bleeding during their pregnancy or high blood pressure or may feel dizziness which can be an indication of pre-eclamsia. Usually in pregnancy care centre there are equipments like ventilator, ECG monitoring device, sphygmomanometer, thermometer etc to measure the abnormalities of patients.

1.1 ELECTROCARDIOGRAM

By means of ECG leads measurements of depolarization and repolarization of cardiac muscles are monitored. This project is used to monitor the significant increase in heart rate, PR interval, deviation of QRS axis and T wave inversion.

1.2 PULSE RATE MONITOR

A pulse rate monitor records the heart rate in real time. During pregnancy, the amount of blood pumped by the heart increases by 30-50%. When the cardiac output increases, the heart rate at rest speeds up from a normal pregnancy rate of about 70 beats per minute to 80 or 90 beats per minute.

1.3 HEART BEAT SENSOR

A person's heartbeat is the sound of the valves in his/her heart contracting or expanding as they force blood from one region to another. The number of times the heart beats per minute (BPM), is the heart beat rate and the beat of the heart that can be felt in any artery that lies close to the skin is the pulse. When there is a change in the value, by means of GSM module the in accuracies are send by SMS to the doctor and the relatives.

1.4 TEMPERATURE SENSOR

A temperature sensor is used to determine the body temperature of a person. Normal body temperature of a person is 37 degree Celsius. Whereas, in case of pregnant women, it goes to 37.8 degree Celsius normally.

II. MATERIALS AND METHOD

We are using the Arduino development board it having atmega328p microcontroller. And we connect full 3 sensors for measuring parameter of the patient. If any things occurs to the patient it will sent the message to the respective person through the GSM wireless sensor network.

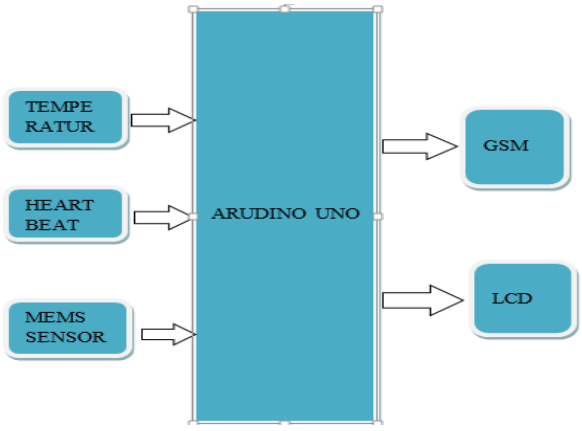

Fig a: ***Block Diagram for pregnancy care unit with GSM***

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III. RESULT

With the help of active network technology and mobile interface, the mechanism of giving alert message to the patient's family and doctor is fixed. Moreover, the doctor can monitor the patient at any time. By means of application of this scalability of the proposed system in the rural areas where healthcare facilities are mostly in need, this will be highly efficient in communication with rural and urban patients. Moreover, this system can be used in home automation in the future. The main problems for the creation of Internet of Things for healthcare applications are monitoring all patients from various places. Thus Internet of Things in the medical field brings effective patient monitoring with low cost and also reduces the risk of managing diseases among patients. In this paper discuss about, monitoring patient's body temperature, respiration rate, heart beat and body movement using Arduino UNO. The values can be displayed in the LCD.

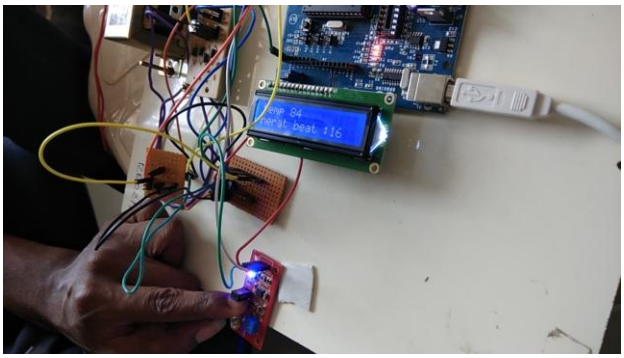

Fig b: ***Temperature and Heart Beat Detection***

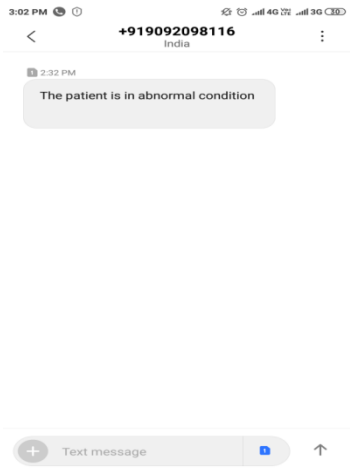

Fig c: ***Text Message Received By the Doctor of the Patient during Abnormal Condition***

IV. CONCULSION

By the making of active network based wireless technology with sensor-microcontroller module, the proposed NWSPMS that is responsible for determining the health of many number of patients in the same critical unit. The above proposed system is the most affordable system that can be used for this purpose. The most important benefit of this system is the doctors who can monitor the physical and medical conditions of their patients from any part of the world and hence gives instructions to others paramedical staffs to attend to the patient. Thus the proposed system can also be called as an e-hospital system, where the doctor and the patient can attend many patients simultaneously.

V. CONCULSION

Since it is a restless monitoring system, it takes less time for the doctor to give clear and accurate result. By applying this model of the proposed system in the under developed areas where healthcare facilities are mostly needed, the system can act as bridge between the distant patient and the urban medical health service provider. Furthermore, this topic can be modified that will focus on the possibility of an effective and reliable home automation system which can be used by decreasing the number of sensor microcontroller module into a single unit.

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