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Vericose Veins Patient Monitoring and Automated Treatment Using Arduino Uno

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ABSTRACT: Varicose veins are twisted, enlarged veins. Any superficial vein may become varicose, but the veins most commonly affected are those in your legs. That's because standing and walking upright increases the pressure in the veins of your lower body. For many people, varicose veins and spider veins are common, mild variation of varicose veins are simply a cosmetic concern. For other people, varicose veins can cause aching pain and discomfort. At times varicose veins can lead to more-serious problems. Treatment may involve self-care measures or procedures by your doctor to close or remove veins. Approximately 23% of US adults have varicose veins. If spider telangiectasia and reticular veins are also considered, the prevalence increases to 80% of men and 85% of women. They are more common in women and older people; varicose veins affect 22 million women and 11 million men between the ages of 40 to 80 years. In this paper we proposed monitoring the varicose patients and automatically given the treatment whenever the patient need.

KEYWORDS: Varicose veins, automated-treatment

I. INTRODUCTION

Varicose veins are a venous disease that doesn't have early detection methods to date. Our project consists of two parts, a way to detect varicose veins early as well as a way to provide treatment. Based on the various journals we have referred to; we have come to the conclusion that early detection is possible by just monitoring parameters: temperature. Those patients suffering from varicose veins were found to have a temperature difference in the affected region compared to the temperature of the rest of the body. Since varicose veins occur due to the malfunctioning of the valves in the veins, blood gets accumulated in the veins. Thus, blood flow decreases, and as a result the temperature increases in the affected area. From the medical journals we have referred to, this increase in temperature is found to be about two degrees from the normal body temperature of the patient. Arduino UNO has been used as the microcontroller which acts as brain of the system; the entire system program is stored in it. The system consists of a thermistor which is used to detect the body temperature. It is fixed on the patient body in two different places. So, the one is fixed near the chest and another is fixed on the leg. In total we use six thermistors and these are the sensors used to measure the localized variation of temperature of the affected region. One thermistor is placed in the upper body p art to measure the normal body temperature and five other thermistors are used in the region below the calf and are placed in a strip. The average value of all the outputs from the five NTCs are taken and is compared with the value from the upper body part. The difference is noted and the Kelvin value is converted to degree Celsius. The ZIGBEE is works as a communication device. If any one of the thermistors can detect any abnormality in the position of the leg, ZIGBEE transmits the data to the receiver. And whenever ZIGBEE receives the data from the transmitter the vibration motor will run and give the massage to the patient. increase in the temperature of the affected region above normal body temperature improper blood flow or less blood flow is indicated and this information is sent to the application and vibrations are applied automatically. Vibrations can also be manually switched ON and OFF. LCD is used to display all the information.

II. RELATED WORK

In order to acquire wide knowledge about designing our project, we have gone through many research papers of various authors related to our project. The papers listed below will give brief explanation of the whole theme.

- **In 2017 Sumit Majumder, Tapas Mondal and M. Jamal Deen worked on "Wearable Sensors for Remote Health Monitoring".** In this paper, we have presented and compared several low-cost and non-invasive health and activity monitoring systems that were reporting recent years. A survey on textile-based sensors that can potentially be used in wearable systems is also presented. Finally,

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compatibility of several communication technologies as well as future perspectives and research challenges in remote monitoring systems will be discussed.

- **In 2019 Brian Meneses-Claudio, Witman Alvarado-Diaz, "Detection of Suspicions of Varicose Veins in the Legs using Thermal Imaging".** The thermal image is processed in MATLAB to identify the segments of the histogram of the thermal image, to obtain the area of the highest temperature indicating the presence of varicose vein in the subject's leg. The segmentation of the areas with the highest temperature was obtained as a result to be overlaid on the real image, showing the real image with the varicose vein segment found in the thermal image processing.
- **In 2020 Dr. S. Vijayalakshmi, Arul raja K, Gokulnath A J and Ganesh Kumar V, "The Prediction and Prevention of Varicose vein using Raspberry pi ".** The determination of the disease is done using noninvasive diagnostic techniques with the help of sensors. These values are obtained with respect to time. The sensors used are flex sensor, force sensor and accelerometer. is standing then, the force given by the person is determined. This is to determine he pressure given to the veins in the lower extremities. Accelerometer is also a 14-sensor used to determine the state of the leg, especially for walking.

III. PROPOSED ALGORITHM

Arduino UNO, the microcontroller which acts as brain of our system; hence the entire system program is stored in it. The system consists of thermistors which is used to detect the body temperature. It is fixed on the patient body in two different places using two different modules. One is fixed nearby chest and another one is fixed on the leg position. The ZIGBEE is worked as communication device. If one of the thermistors detect any abnormality in the leg position the ZIGBEE transmit the data to the receiver. And whenever ZIGBEE receives the data from the transmitter the vibration motor will run and give the massage to the patients. LCD is used to display all the Information.

MODULES NAME:

• TEMPERATURE MONITORE
• VERICOSE VEINS RECTIFICATION MODULE

• **TEMPERATURE MONITORE** In this project our main motive is to relief the varicose veins for the particular time. The thermistor used for to identify the varicose veins, that time temperature will be increase. So, the thermistor will be identified. That time the ZigBee will be send the ZigBee.

•**VERICOSE VEINS RECTIFICATION** The ZigBee receiver to receive the signal from thermistor and the vibration motor will be vibrate and rectify the varicose veins.

IV. RESULTS

Detecting the varicose veins in patients at the early stages and the treatment is given automatically whenever the patients need it.

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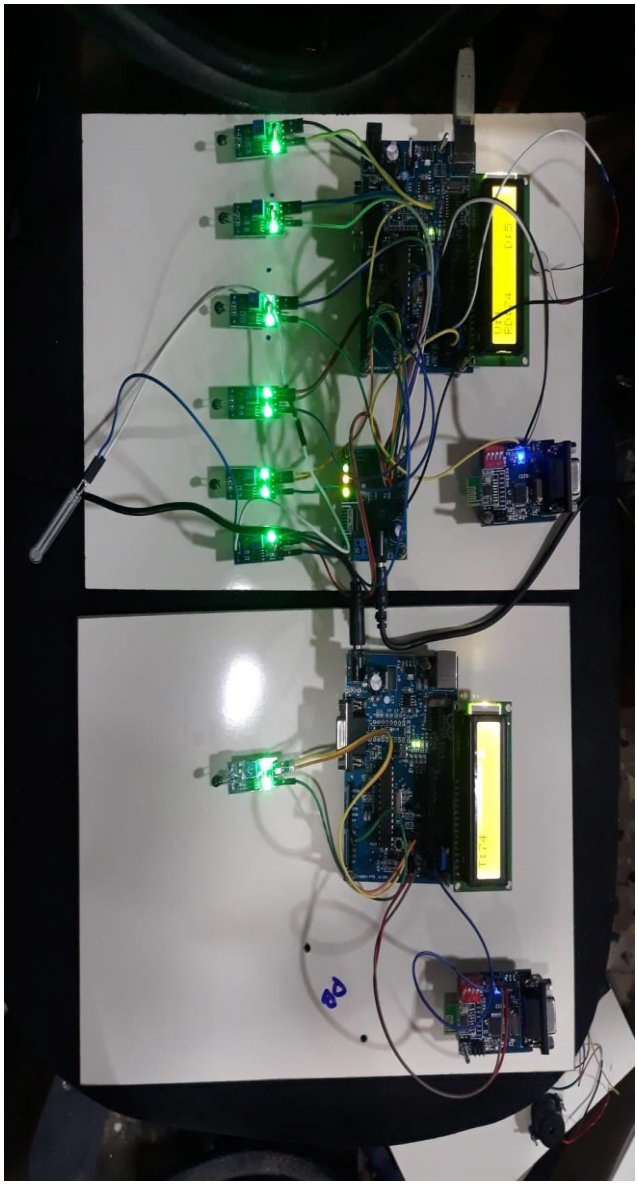

V. CONCLUSION

Varicose veins of the lower extremities. Therefore, this paper uses Arduino UNO microcontroller which acts as brain of our system; hence the entire system program is stored in it. The system consists of the thermistor is used to know the body temperature. It is fixed on the patient body in two different places. So, the one is fixed nearby chest and another one is fixed on the leg position. The ZIGBEE is worked as communication device. If one of the thermistors detect any abnormality in the leg position the ZIGBEE transmit the data to the receiver. And whenever ZIGBEE receives the data from the transmitter the vibration motor will run and give the massage to the patients. LCD is used to display all the Information. In this paper we proposed monitoring the varicose patients and automatically given the treatment whenever the patient need.

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