

# Cardiovascular Diseases By Using Ultrasound Images: Review

Syed Sajad Hussain<sup>1</sup>, Dr. R. Thiruvengatanadhan<sup>2</sup>

<sup>1</sup>Dept of Computer & Information Science

<sup>2</sup>Assistant professor, Dept of Computer Science and Engineering, Faculty of Engineering and Technology

<sup>1,2</sup> Annamalai University, India

**Abstract-** Since 21<sup>st</sup> century cardiovascular diseases (CVD) is found one of the main cause of death throughout the globe. In India this vulnerable disease badly affect thousands of people during last few decades. Unfortunately large number of population is unaware about the causes, effects, consequences and remedial measures of this disease.

Present paper aims to highlight the various procedures that are useful for the diagnosis and treatment of cardiovascular illness. Now a day's government and NGO's are keenly watching this disease, proper attention is given towards the identification and prevalence of this vulnerable illness. In India alcohol as well as tobacco consumption, is common among people which results cardiovascular illnesses. Researchers found different procedures and techniques that have significant impact on anticipation and control of cardiovascular illness

**Keywords-** Cardiovascular Disease, Ultrasound Imaging, tobacco consumption, obesity, hypertension, cholesterol, diabetes.

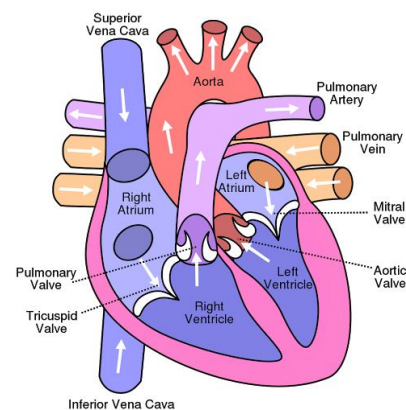
## I. INTRODUCTION

The human heart is hollow, pair shaped muscular organ that pumps or circulates blood to all parts of the body. Human heart weights around one pound i.e. (250 to 350 grams) and its size is equal to the span of a human fist that looks like inverted cone and is most grounded muscle in human body. Heart lies at the centre of the circulatory system, slightly to the left of the chest. The breastbone (sternum) and rib cage protects heart. Heart is a combination of blood vessels such as arteries, veins and capillaries. The work of blood vessels is to carry blood to and from all parts of the body. For normal functioning of the heart, blood carries the oxygen and nutrients.

There are four chambers of heart. The upper two and the lower two chambers called atria and ventricles respectively. The lower chambers are bigger than upper chambers. Both chambers are separated by valves which allow

blood to follow in one direction. The septum (wall of tissue) separates the right and left side of the heart.

Each side of the heart has a special job. The right side receives blood from the body, and then pumps it into the lungs where the carbon dioxide (CO<sub>2</sub>) is removed and oxygen added. The oxygen-rich blood returns from the lungs to the left side of the heart, it pumps the oxygen-rich blood through the aorta and throughout the body.



## II. REVIEW OF LITERATURE

Cardiovascular disease (CVD) is one of the major causes of death; this disease kills 58 million of people globally. In 2008 in India one-fourth of all deaths were due to CVDs. Between 2005- 2020 is expected to be the fastest growing disease, while deaths due to non-communicable diseases, half of which will be due to CVD from other ways like infectious diseases, nutritional deficiencies, and maternal and perinatal conditions combined are projected to decline by 3%. Between the age group of 25 to 69 (24.8%), people are losing their lives due to CVDs.

### Prevention of cardiovascular disease

#### Tobacco Consumption

Smoking or using tobacco is injurious to health. Non smokers and those who quit smoking should be encouraged,

also smokers should advise to quite such bad habit. Lifetime smoking is danger for healthy life; it is prone of creating coronary illness. Chemicals in tobacco enter into the circulatory system from the lungs, which results various problems in blood vessels and other body parts which lead to chronic infections, stroke, even some cancers like lung cancer.

The connection between cardiovascular disease and tobacco use (like Cigarette, Hukka, Beeri, Niswar) is well known. In 1999, 4 million deaths occur due to tobacco and by 2030 it is probably going to rise 10 million annually. According to WHO report it is predicted that by 2020 in India death rate may exceed by 1.5 million annually. Cigarette smoking builds the danger of CVD demise by 70 % contrasted and not smoking. Roughly 194 million, 15 years and older (150 million men and 44 million women) consumed various form of tobacco. 79 % of tobacco buyers lives in rural areas in India. In 2000, 4.83 million people died globally by smoking, among them 2.41 million deaths in developing countries. In USA there is a solid proof base for the viability of group based intercessions, for example, running supported broad communications battles, raising tobacco costs, diminishing the cost of treatment and setting up phone quit lines.

Research by Oxford found that 50 years old men smokers have high cholesterol and blood pressure (hypertension). Their findings also show that these people die 10 years early than non smoker men.

### **Obesity**

Obesity is the most common nutritional disorder in humans in present days. It is also one of the major causes of mortality and morbidity for associated metabolic disorders and cardiovascular illnesses. Obesity is one of the fast growing developed health problem in present world, according to WHO report in 2014, more than 1.9 billion (39%) adults aged 18 years and older were overweight. Of these over 600 million adults were obese. In same year nearly 13% of world's adult population (11% men and 15% women) was obese.

### **Hypertension**

Hypertension or High blood pressure is another cause of cardiovascular illness; it affects the blood vessels (arteries) and put strain the heart. A high level of systolic and diastolic blood pressure is strongly associated with CVD. Hypertension is one of the most important causes of premature death globally and the problem is growing; in 2025, an estimated 1.56 billion adults would be living with hypertension. Every year nearly 8 million people die due to hypertension throughout the world and nearly 1.5 million people in the

South East Asia (SEA) region. Approximately one third of the adult population in the South East Asia Region has high blood pressure. In Indian nearly 27.3% urban and 12.2% in rural population have prevalence of adult hypertension. In light of these examinations the amount of adults with hypertension in India and China together would outperform 100 million.

### **Cholesterol**

High cholesterol level is another cause of cardiovascular disease, diabetes and hypertension. Therefore people should go for cholesterol level check up at least once in five years beginning at age of 18. So there cholesterol remains normal level, results lower chances of cardiovascular problems.

### **Decision aids**

Specialists, Doctors and patients can utilize decision aids together to help pick the best course of action to take.

### **Diabetes**

The expanded hazard that diabetes infection posture to creating cardiovascular maladies can be changed. Depending upon individual's hazard factors, like overweight or heredity of diabetes, specialists may suggest early screening for diabetes. American diabetes association prescribes beginning screening at age 45, and afterward retesting at regular intervals.

On the off chance that a person has a condition, for example, elevated cholesterol, hypertension or diabetes, his specialist may endorse drugs and suggest way of life changes.

## **III. METHODOLOGY**

Securing of computerized picture and preprocessing strategies assumes a key part in clinical diagnosis. The ultrasound medicinal pictures are considered reliable and better than other imaging modalities. Ultrasound imaging utilizes sound waves to create live pictures inside the body. It is utilized to help diagnose the causes for agony, swelling and disease inside the body. It is also used to help direct biopsies, analyze heart conditions, and diagnose illness of inner body organs. Ultrasound is protected, noninvasive, and does not utilize ionizing radiation.

Ultrasound imaging like ultrasound examining or scanning or sonography includes the utilization of a little transducer (Test) and ultrasound gel set specifically on the skin. High recurrence sound waves are transmitted from the

test through the gel into the body. The transducer gathers the sounds that skip back and a monitor at that point utilizes those sound waves to make a picture. Since ultrasound pictures are caught progressively, they can demonstrate the structure and development of the body's inward organs, and in addition blood moving through veins. Ultrasound imaging is a noninvasive medicinal test that enables doctors to diagnose and treat illnesses. Ultrasound has been utilized to picture the human body for over 50 years. Dr. Karl Theo Dussik, an Austrian neurologist, was the first to apply ultrasound as a therapeutic indicative apparatus brain picture. Today, ultrasound (USG) is a standout amongst the most generally utilized imaging advancements in medication. It is convenient, free of radiation hazard, and generally modest when contrasted and other imaging modalities, for example, attractive reverberation and processed tomography. Moreover, USG pictures are tomographic, i.e., offering a "cross-sectional" perspective of anatomical structures. The pictures can be gained "continuously," hence giving momentary visual direction to numerous interventional methods including those for local anesthesia and torment administration.

#### IV. LIMITATIONS

Ultrasound imaging is not useful for diagnosis to all types of illness as it is not impossible through bone or air (constraints or limitations) on chest imaging and in ultrasound images there is presence of noise as comparison with more expensive methods like CT and MRI.

#### V. CONCLUSION

The present paper aimed to highlight the importance of ultrasound images for the diagnosis of cardiovascular disease for this purpose various research paper were reviewed by the researcher which shows the effectiveness of ultrasound on diagnosis of cardiovascular illness. In modern day large numbers of people are faced various heart related problems, as ultrasound faculty is not available in all hospitals.

Due to early diagnoses of heart related illness by ultrasound imaging, patients would be given early treatment which save their life, therefore ultrasonography plays a vital role in the diagnosis of cardiovascular diseases. Large number of research is going on to make easy and reliable use of ultrasound, as presently only cardiologists and radiologists are able to use such type of instruments. It is expected that in coming years every physician would be able to use such instrument and heart related problems can be detected as early as possible.

#### REFERENCES

- [1] WHO – 2014 Cardiovascular disease: prevention and control <http://www.who.int/dietphysicalactivity/publications/facts/cvd/en/> assessed on 05-04-2017.
- [2] <https://patient.info/in/health/preventing-cardiovascular-diseases>.
- [3] Kannel, W., B., & Shurtleff, D. The Framingham Study: cigarettes and the development of intermittent claudication. *Geriatrics*. 1973; 28: 61-68.
- [4] Deepa, S., & Bani, T., A. "Risk Factors Associated with the Increasing Cardiovascular Diseases Prevalence in India: A Review".
- [5] Kannel, W., B., & Castelli, W., P., Gordon, T., McNamara, P., M. Serum Cholesterol, lipoproteins and the risk of coronary heart disease: the Framingham Study. *Ann Intern Med*. 1971; 74:1-12.
- [6] Kannel, W., B., & Sorlie, P. "Some health benefits of physical activity: the Framingham Study". *Arch Intern Med*. 1979; 139:857-861.
- [7] Kannel, W., B., Dannenberg, A., L., & Abbott, R., D. Unrecognized myocardial infarction and hypertension: the Framingham Study. *Am Heart J*. 1985; 109: 581-585.
- [8] Mukherjee, A., K. India's health-today and tomorrow *Indian Med Assoc* 1995; 93(8).
- [9] Global burden of hypertension: analysis of worldwide data; *The Lancet* 2005; 365 (9455):217-223.
- [10] Disadvantages of Ultrasonography images, <http://www.radiologyinfo.org/en/info.cfm?pg=genus>, Jan 28, 2013.