ESTIMATION OF VARIOUS BLOOD PARAMETERS

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ABSTRACT

Cardiovascular disease refers to any class of disease that affects the heart or the blood vessels. Cardiovascular disease can also affect the brain and kidneys. The most common forms of cardiovascular disease are atherosclerosis and cardiovascular hypertension which are the leading cause of death worldwide. Project was carried out in the Mirpur to estimate various blood parameters in the known cardiovascular patients. Individuals have a number of known risk factors for developing cardiovascular disease, such as age, gender, high blood pressure, diabetes, family history, obesity, and a lack of physical activity. Tobacco smoking, excessive alcohol consumption and excessive sugar consumption are three leading causes of cardiovascular disease over which individuals have some control. However, age is the most common and important factor in developing cardiovascular disease. The results showed that high age people have more risk of cardiovascular disease. In such patients various other blood factors fluctuate from the normal range and are responsible for development of other diseases. Continuous monitoring of these factors and taking measures for controlling may decrease the chances of further progression of disease.

Key words - Cardiovascular disease,Serum Creatinine, Creatine kinase N-Acetyl Cysteine, Creatinine Kinase, Lactate Dehydrogenase, Aspartate Amino Transferase

1. INTRODUCTION

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels. Cardiovascular disease includes coronary artery diseases (CAD) such as angina and myocardial infarction (commonly known as a heart attack(Adams et al. 2004). In CVDs have many others heart related diseases like stroke, failure, rheumatic, hypertensive, valvular, cardiomyopathy, heart arrhythmia, carditis, aortic aneurysms and peripheral artery disease(Lin et al., 2010).

The underlying mechanisms vary depending on the disease in question. Atherosclerosis disease frequently happen in artery of coronary and peripheral. Most common risk factors for atherosclerosis are smoking, high blood pressure, excess consumption of alcohol, obesity and high cholesterol level (Tendera et al., 211). Death rate in CVD is 13% by high blood pressure,6% in diabetes, 5% in obesity andtobacco results in 9%. Rheumatic heart disease may follow untreated strep throat (Botton et al., 2007).

Arteries and vessels flow the blood in heart anddirectly involve in heart disease when plaques form in arteries. It is narrow the arteries and reduce the essential nutrient components and oxygen for reaching toward heart.Plaque is a waxy substance consist of cholesterol and fatty molecules. High blood pressure, smoking andincrease level of cholesterol are the main factors to cause plaque by damaging inner lining of arteries (Kivimäki et al., 2002).

Angina is also sign of heart artery disease. It is chest pain like pressure or squeezing the chestthat happens when heart muscle doesnot get insufficientoxygen (Tie et al., 2000) The pressure or squeezing feeling or discomfortmay spread to the neck, jaws, arms and back. Women reported more symptomthan men like indigestion, heartburn, heavy weight in chest, nausea (stomach problems), vomiting, fatigue (weakness), or shorter breathing (Saul et al. 1990).Heart failure does not mean that your heart is not working or about to stop. It means that heart cannotmeet the demands of everyday activities (Lints et al. 1993).

There are many risk factors for heart diseases: age, lack of exercise, gender, smoking, extreme level of alcohol consumption, unhealthy diet, obesity, stress, genetic predisposition, family history, high blood pressure (hypertension), elevated level of blood sugar (diabetes mellitus), raised blood cholesterol (hyperlipidemia)and air pollution. Every risk factor varies from individual contribution to different communities or ethnic groups but generalinvolvement of these risk factors is very consistent. In many researches showed that some risk factorsare immutable like age, gender, family history or genetic predisposition but important cardiovascular risk aspects are changeable bydrug treatment, changing of lifestyle and social for illustration of hypertension, hyperlipidemiaand diabetespreclusion (McDonald et al., 1994).

It is assessed thatSouth Asian subcontinentis having load of 60% world's cardiovascular disease that in spite of only 20% of the world's population. The main cause of it secondary mixing of genetic predisposition and environmental factors.the combined working of Indian Heart Association organizationand World Heart Federation organization is aimedto promote the awareness about theheart diseases and their causing factor issues (Czubryt et al., 2006).

Some blood tests, called cardiac enzymes, can check whether the heart muscle is damaged, and indicate if a person has had a heart attack. These tests measure proteins or enzymes found in the heart muscle – they are often called cardiac biomarkers. When the heart muscle is injured, they are released into the bloodstream and the levels that can be detected using blood tests go up. This can happen during and after a heart attack. Cardiac enzymes studied are CK-MB, CK-NAC, LDH and GOT(AST).

2. MATERIALS AND METHODS

About 100 patients having cardiovascular diseases have been screen from the different region of Mirpur division and different parameters like (Sugar level, serum urea, creatinine, sodium and potassium level and cardiac enzymes) are analyzed and result were obtained.

2.1. Study Area

One-month survey to the Kashmir institute of cardiology (KIC) and patients were selected for the estimation of various parameters.

2.2. Questionnaire

Questionnaire was developed for the collection of data from the patients. Data was collected from the patients after their willingness.

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Survey for collection of data from Cardiovascular Patients

i- Name: _____

ii- Sex: _____ iii- Age: _____

iii- District: _____ v- Residence: _____

_____

vi- Onset of CVD: _____

vii- Stage of disease: _____

viii- Other pathological problems: _____

- Onset of other diseases: _____

x- Smoking: Smoker/Non-smoker xi- Smoking duration: _____

Blood Serum Analysis

a)- Serum bilirubin: _____

b)- Serum Urea: _____

c)- Sugar: _____

d)- Serum Sodium: _____

e)-Serum creatinine: _____

f)- Serum potassium: _____

g)- Cardiac enzymes: _____

Signature

3. RESULTS AND DISCUSSION

3.1. ESTIMATION OF CARDIOVASCULAR DISEASE ON GENDER BASIS

Cardiovascular disease effect both male and females. In current study we have cardiovascular patients of both gender .During our survey 100 patients were studied 55 (55%) patients were male and 45 (45%) were females. As below graph shows that people above 50 are more prone to the cardiovascular disease and people above 60 are at greater risk especially male.

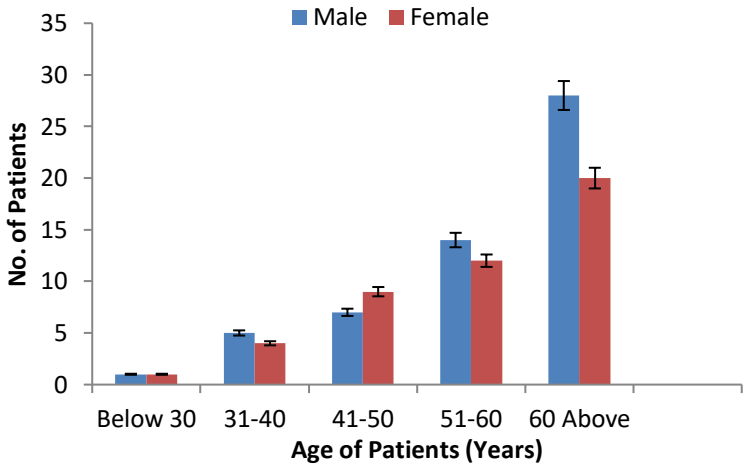

Figure1. Gender study of cardiovascular disease .

3.2. ESTIMATION OF SERUM UREA LEVEL IN CVP

High level of urea may leads to cardiovascular disease. During our survey 92 patients were studied out of that 52 were male and 40 were females. As Fig.2 shows the normal urea level (below 50) and high urea level (above 50). In this case male are at high risk. These patients may have chance of kidney disease as well.

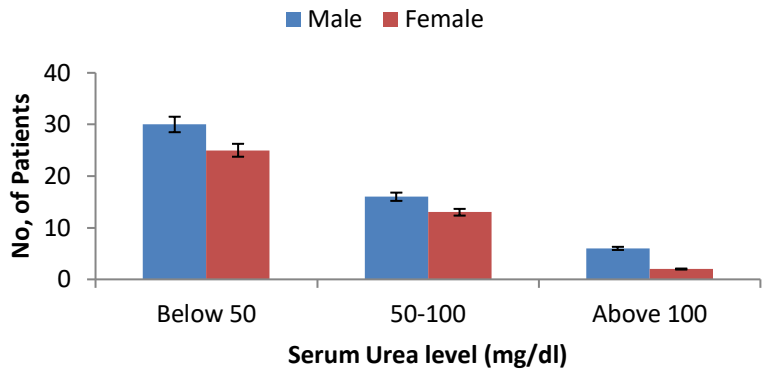

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Figure 2. Serum Urea level in CVP.

3.3. ESTIMATION OF BLOOD GLUCOSE LEVEL IN CVP

People affected from Diabetes are increased risk of cardiovascular disease. Diabetes is the leading cause of death in cardiovascular patients. As below graph shows the comparative study of blood glucose level in male and female patients having CVD. During our survey 75 patients were studied, out of them 47 (63%) patients having normal glucose level while 28 (37%) patients having high glucose level. In this case females are at high risk.

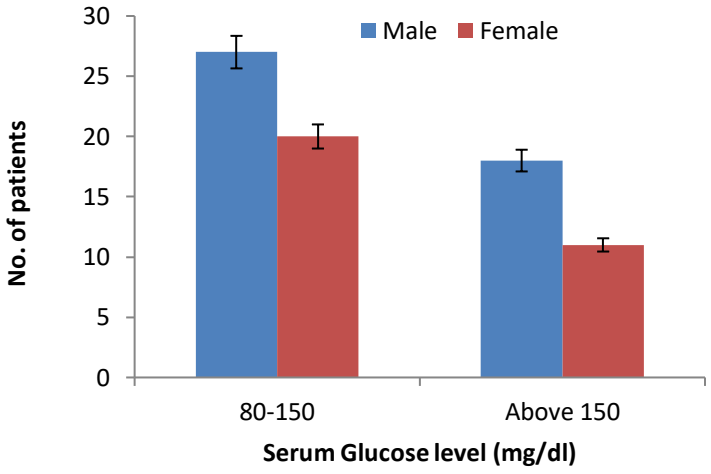

Figure 3. Blood Glucose level in CVP.

3.4. ESTIMATION OF SERUM CREATININE LEVEL IN CVP

High level of creatinine effect both male and female patients of CVD. Serum Creatinine has been associated with increased mortality in hypertensive person. As below graph shows the normal creatinine level which is 0.7-1.3 and low creatinine level which is below 0.7 and high creatinine level which is above 1.3. People having creatinine level above 1.3 are at greater risk of CVD. During our study 60 patients were studied out of them 33 are male and 27 were females. In male 23 patients having normal creatinine level while 10 (30%) patients having high level of creatinine. In female 18 patients having normal creatinine level and 8 (30%) patients having high creatinine level while 1 (4%) patient have low level of creatinine. In this case both male and female are equally effected. High level of creatinine leads to kidney complications as well.

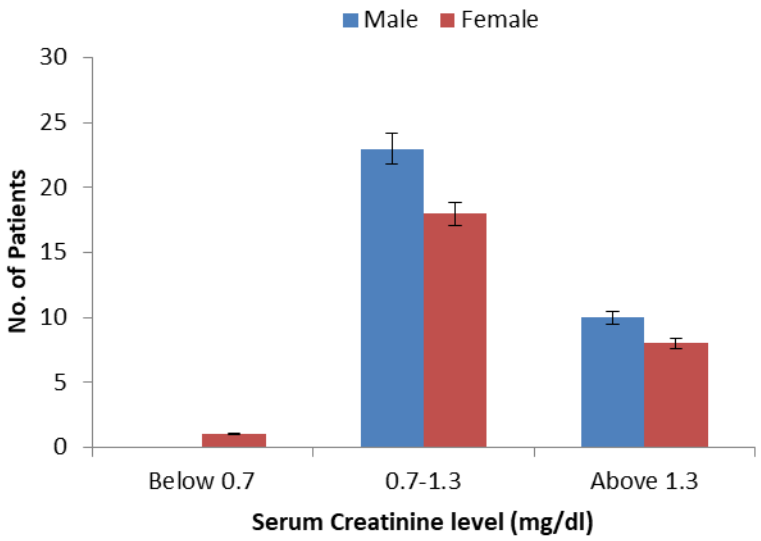

Figure 4. Serum Creatinine level in CVP.

3.5. ESTIMATION OF SERUM SODIUM LEVEL IN CVP

As Fig.5 shows the normal sodium level which is between 135 to 155 and low level of sodium which is below 135. If sodium level decreases from this range than there is more chance of CVD. During our survey 61 patients were studied .out of them 37 were male and 24 were female. In male 11 (28%) patients out of 37 having low sodium level while others are considered normal.

In females 8 (33%) patients out of 24 having low sodium level while others are considered normal. In this case female are more affected.

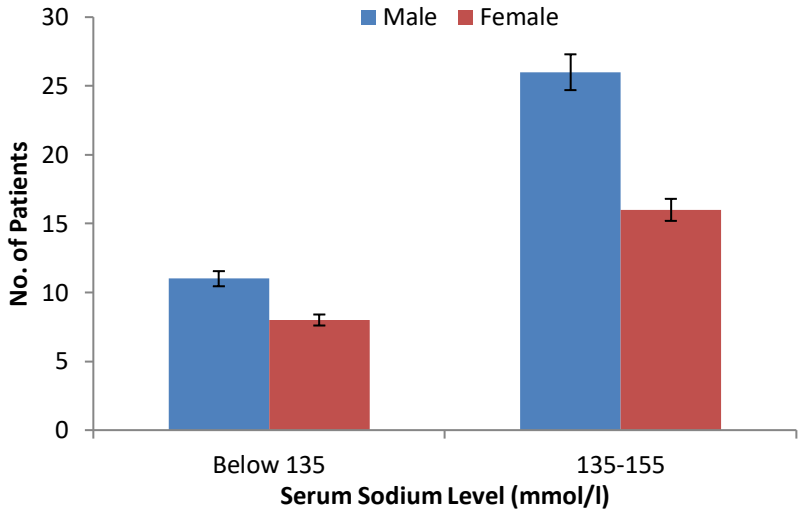

Figure 5. Serum Sodium level in CVD.

3.6. ESTIMATION OF SERUM POTASSIUM IN CVP

Low potassium results in the increased risk of stroke and might also results in Coronary Heart Disease(CHD).As Fig 6 shows the normal potassium level in serum is in a range of 3.3 to 5.5. If potassium level increased to above 5.5 or decreased to 3.3 are greater risk of CVD. During our survey 71 patients were studied out of them 39 are male and 32 were females. In male 33 patients are normal and 5 (13%) patients having low potassium level while 1 patient has high potassium level. In female 28 patients are normal and 2 (6.5%) patients having low potassium level while 2 patients having high potassium level. In this case males were affected more.

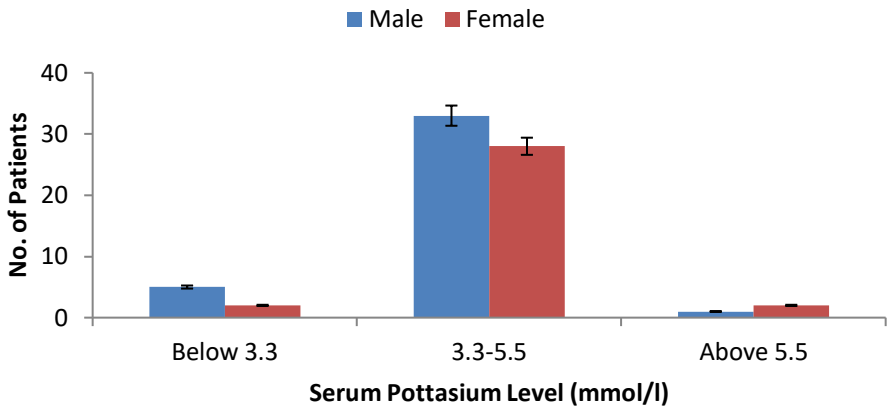

Figure 6. Serum Potassium level in CVP.

3.7. STUDY OF CARDIAC ENZYME

3.7.1. Estimation of CK-NAC in CVP

As below graph shows the normal level (below 90) and high level (above 90) of CK-NAC. During our survey 46 patients were studied out of them 28 were male and 18 were female. In male 23 patients have normal value of CK-NAC while 5 (18%) patients have high level of CK-NAC. In females 13 patients have normal CK-NAC level while 5 (28%) patients have high level of CK-NAC. Females are at greater risk of heart disease in this case.

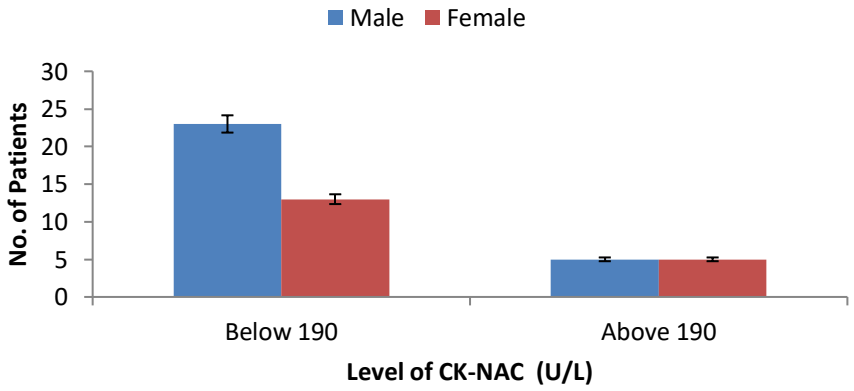

Figure 7. CK-NAC level in CVP.

3.7.2. Estimation of CK-MB in CVP

During our survey 46 patients were studied of them 27 were males and 19 were females. In male 19 patients have normal value while 8 (30%) patients have high level of CK-MB. In females 12 patients have normal value while 7 (37%) patients have high level of CK-MB In this case females are affected more. As Fig.8 shows the normal level of CK-MB which is below 24. Peoples having CK-MB level above 24 are at greater risk of CVD.

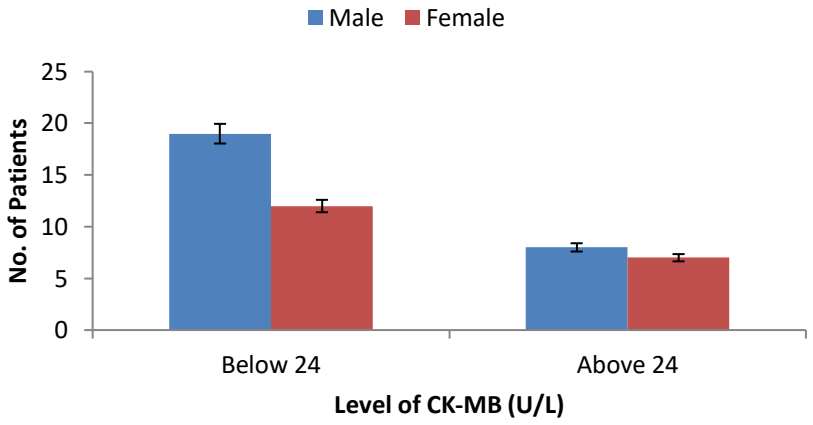

Figure 8. CK-MB level in CVP

3.7.3. Estimation of LDH in CVP

As Fig.9 shows the normal level of LDH ranges from 207 to 414. If LDH level increased from 414 or decreased from 207 than there is a greater chance of CVD. During our survey 55 patients were studied out of them 28 were males and 27 were females In males 16 patients have normal value while 8 (29%) patients have the high level of LDH. In females 9 patients have normal value and 7 (26%) patients have high level of LDH while only 1 (4%) patient have the low level of LDH. In this case males are more affected.

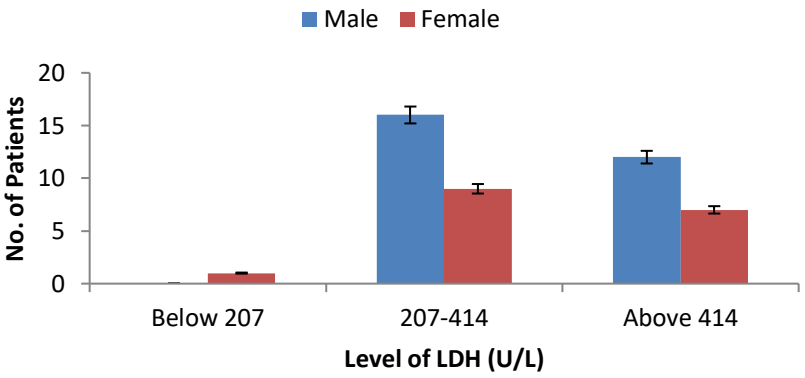

Figure 9. LDH level in CVP

3.7.4. Estimation of GOT (AST) in CVP

As Fig.10 shows the normal level of GOT (AST) which is below 40 and high level and extreme high level of GOT(AST). People having the GOT (AST) level above 40 are at increased risk of CVD. During our study 45 patients were studied out of them 27 were males and 18 were females. In males 16 patients have normal value and 9 (34%) patients have high value while 2 (7%) patients have extreme high level of GOT(AST). In females 10 patients have normal value and 5 (28%) patients have high value while 3 (17%) patients have extreme high level of GOT(AST). In this case females are affected more.

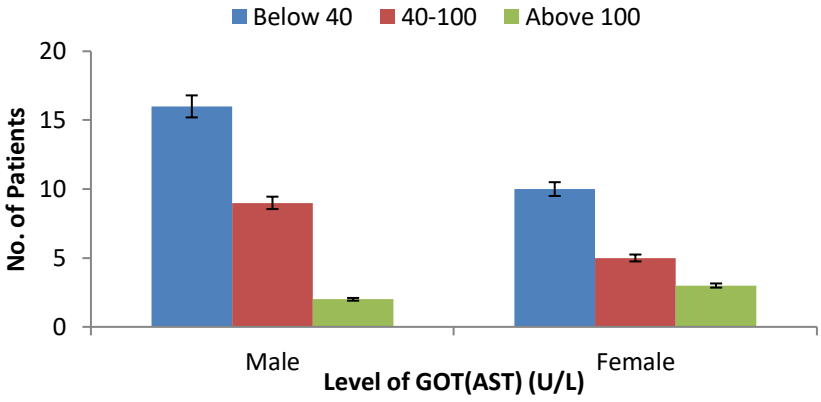

Figure 10. GOT (AST) level in CVP

4. CONCLUSIONS

Cardiovascular disease effect both male and females. During our survey 100 patients were studied 55 (55%) patients were male and 45 (45%) were females. People above 50 are more prone to the cardiovascular disease and people above 60 are at greater risk especially male. High level of urea may leads to cardiovascular disease During our survey 92 patients were studied out of that 52 were male and 40 were females. Patients with high urea level may have chance of kidney disease. High level of creatinine effect both male and female patients of CVD. Serum Creatinine has been associated with increased mortality in hypertensive person. People having creatinine level above 1.3 are at greater risk of CVD. Both male and female are equally effected with high creatinine level. High level of creatinine also leads to kidney complications as well. If sodium level decreases from the normal range than there is a more chance of CVD. Female are more affected by low sodium level. Low potassium results in the increased risk of stroke and might also results in Coronary Heart Disease (CHD). If potassium level increased to above 5.5 or decreased to 3.3 are greater risk of CVD.

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