

## Risk factors of Iranian patients with three vessels disease candidate for coronary artery bypass graft surgery (CABG)

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### ABSTRACT

**Objective:** To determine the modifiable risk factors among patient with three vessels disease (3VD) who are candidate for coronary artery bypass graft (CABG) surgery.

**Methodology:** This study investigated one thousand coronary patient with 3VD (660 males and 340 females) with mean age 54.8±9.01 years. Information regarding outcome variable such as demographic and coronary risk factors parameters in patients referred to Jamaran Heart Hospital were collected. We used a questionnaire for collecting data from patients and their medical records.

**Results:** About 66% of patients were male and 34% were female. Mean age of patients' were 54.8±9.01 years. History of diabetes, Hypertension and smoking was positive in 38%, 32% and 40%, respectively. About 11% had BMI >30, 45.6% of patient had O+ (blood group), 87% of patient had total cholestrol >200, 81% had TG >200 and about 70% had LDL>100. There was statistically significant difference between sex with cigarette smoking, HTN, DM (P<0.05) and age with TG (P<0.05).

**Conclusion:** Results of this study showed that hyperlipidemia, diabetes and smoking are most common modifiable risk factors of CAD in tripple vessel disease. Findings of this study provide more information on the database of the risk factors among patients with progressive coronary artery disease in Iran. Therefore, applying education for changing lifestyle including smoking cessation, controlling diabetes, healthy diet and exercise is necessary.

**KEY WORDS:** Coronary artery surgery, Risk factor, Three vessels disease.

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### INTRODUCTION

Cardiovascular diseases are the most common and important health problems that threaten human life.<sup>1</sup> According to WHO at least 15 million deaths occurs due to cardiovascular disease in the world.<sup>2</sup> It is estimated that in 2020, 25 million deaths will take place from cardiovascular disorders each year.<sup>3</sup> In 1997, majority of deaths were due to cardiovascular disease. Among cardiovascular diseases, coronary artery disease (CAD) was the most common cause of death.<sup>4</sup> With the change in life style and sanitary life style Iranian population are more susceptible to CAD.<sup>5</sup> For diagnosis of CAD angiography is the gold standard. The most common cause of referring for angiography is CAD.<sup>6</sup> Therefore, evaluating the coronary risk factors of patients with three vessel's disease will provide useful information to the

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knowledge and attitude of their risk factors. And it is very important for appropriate care and teaching to the patients.<sup>4</sup> The presence of coronary artery disease (CAD) is associated with one or more characteristic findings known as risk factors. Risk factors have been determined on the basis of systematic observations of relationships between certain characteristics and the subsequent progress of CAD.

For the purposes of both patient and professional education, we use here two categories of unavoidable and avoidable risk factors.<sup>7</sup> A variety of risk factors associated with the CAD have been identified. Many studies demonstrate that hypertension, smoking, obesity, sanitary life style, diabetes mellitus, hyperlipidemias are the avoidable or modifiable risk factors for CAD.<sup>4</sup> Apart from their modifiable pathogenic effect, these risk factors continue to contribute to development of coronary artery disease. Modifying and controlling these risk factors are important to reduce mortality and morbidity of cardiovascular patients.<sup>4,8</sup> Development of CAD causes chest pain and discomfort for the patients and in progressive stage like stenosis of two or three vessels surgery is required. Treating angina, coronary artery disease by sclerosis is a major focus for patients with CAD. Coronary artery disease is a chronic and often progressive disease. In the last decades, much progress has been made. In addition to medication therapy, invasive procedures have been developed for revascularization.<sup>9</sup> coronary artery bypass grafts surgery (CABG) was introduced in the late 1960s.<sup>9</sup> CABG is a major surgery and more than 2,20000 operations are performed each year.<sup>10,11</sup> It offers the majority of patients' relief from chest discomfort and may also reduce mortality in some cases.<sup>12</sup> However, need for this operation has outstripped capacity, and long waiting lists for the surgery are now common in many countries.<sup>12</sup>

More over, this surgery impose economical, emotional and social problem to the society.<sup>1</sup> However, CABG is a major operation which requires large amount of medical resource, and patients need relatively long time to recover.<sup>5</sup> Therefore, prevention of recurrence and progression of CAD are regarded as major components for CAD prevention.<sup>4</sup> Identifying and modifying of risk factors especially in patients with three vessels disease can improve the quality of life as well as decrease morbidity and mortality of patients. As there was no information available on the three vessels disease risk profile on Iranian patients with CAD, the aim of this study was to describe the level of risk factors in three vessels

disease patients who are candidate for CABG surgery.

## METHODOLOGY

This was a prospective, cross-sectional study conducted in Jamaran Heart Hospital of Baqiattallah Medical Sciences University in Iran. This study described the level of coronary risk factor in Iranian patients with three vessels disease (3VD) and relation between those. All CAD patients who had coronary angiography with a diagnosis of three vessels stenosis from 2005 - 2006 were included in this study. All patients with 3VD after coronary angiography agreed to participate. Data was collected from medical records and from patients. Demographic information such as gender, age, height and weight was collected from patients. For collecting data about risk factors such as history of hypertension, diabetes mellitus, serum cholesterol level and smoking history, we looked at medical records of patients. For collecting information about educational level as well as blood group, job and family history of CAD, a self-developed questionnaire was used.

The body mass index is calculated as weight (kg) divided by height square (m<sup>2</sup>). In general, according to WHO patients with a BMI of 25-29.9 kg/m<sup>2</sup> are considered overweight, while patients with a BMI  $\geq 30$  kg/m<sup>2</sup> are considered obese.<sup>4,13</sup> Data are expressed as mean ( $\pm$  standard deviation) for continuous variable or as rates (percent) for categorical variables. Data were entered and analyzed using the statistical package for social sciences (SPSS, version 13).

## RESULTS

One thousand (n=1000) patients with 3VD participated in this study. The age ranged from 37 to 78 years (mean 54.8, SD  $\pm 9.01$ ). The mean age of male and female patients was 52.6 $\pm 7.5$  and 67.7 $\pm 5.7$  respectively. About 66% of patients (n=660) were male and 34% (n=340) were female, 69.5% were married and most of them were retired (29%). Educational level in most patients was related to under diploma (Table-I).

Table-I: Educational level of patients (n=1000).

<i>Educational level</i>	<i>Males</i>	<i>Females</i>	<i>Total</i>
Illiterate	2.3%	69.1%	25%
Under diploma	47%	26.5%	40%
Diploma	29.5%	2.9%	20.5%
Academic	21.2%	1.5%	14.5%

Table-II: frequency of modifiable risk factors.

Sex Risk factors	Female		Male		Total(%)	P value
	n	%	n	%		
Family history	55	16.2%	175	26.5%	23%	> 0.05
Diabetes mellitus	205	60.3%	175	26.5%	38%	<0.001*
Hypertension	160	47.1%	160	24.2%	32%	<0.001*
Smoking	50	14.7%	350	53%	40%	<0.001*
Hyperlipidemia	183	54%	482	73%	66.5%>	<0.001*

\* Significant

All patients had a history of at least one coronary event such as angina, myocardial infarction, coronary angioplasty and coronary angiography. Two hundred and thirty patients had a history of CAD in first degree relatives, 38% of patients were diabetic on insulin or oral drugs. About 32% of patients had a history of hypertension, 40% of patients were smoker that male (53%) were more smoker than female (14.7%). This difference was statistically significant ( $P<0.05$ ). About 66.5% of patients had hyperlipidemia (Table-II). Analysis of data showed that between sex with diabetes mellitus, hypertension and smoking was statistically significance ( $P<0.05$ ) and also between age and hypercholesterolemia.

About 71.5% of patients were either overweight (BMI 25-29.9 kg/m<sup>2</sup>) or obese (BMI  $\geq 30$  kg/m<sup>2</sup>) (Fig-1).

Most frequency of blood groups was related to O positive (45.6%) and least frequency was AB negative (1.5%) (Fig-2).

## DISCUSSION

In this study, the mean age of patients was  $54.8\pm 9.1$  years. In contrast with similar study in our country<sup>14</sup> or other studies<sup>15</sup> our patients were younger by six years. With this mean of age we can claim that the

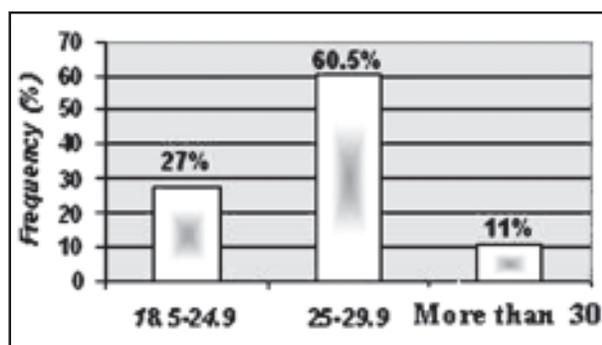


Fig-1: Frequency of body mass index of patients with 3VD

prevalence of coronary artery disease in our society in younger population is high and progressive. This showed that our patients are at least 6 years younger to what is seen in first stage CAD patients. Most of patients with 3VD were male that is similar with other studies.<sup>4</sup> Men have a higher incidence of CAD than women, although this difference becomes less with advancing age.<sup>7</sup>

In Framingham study, data showed that women developed cardiovascular disease at less than one-half the rate of men. Women in that study had a 10% probability of having a cardiovascular event before age 60, as compared with a 27% probability for men.<sup>7</sup> As data showed about quarter of patients were illiterate or elementary and near half of patients have under diploma level. Many studies emphasis on the role of educational level as a social index.

According to Diez et al low level of education can accompany with higher risk factors for patients with CAD.<sup>16</sup> More than two thirds (71.5%) of patients in this study were either overweight or obese. According to the American Heart Association, obesity is an independent risk factor for CAD.<sup>4,17</sup> Weight loss in

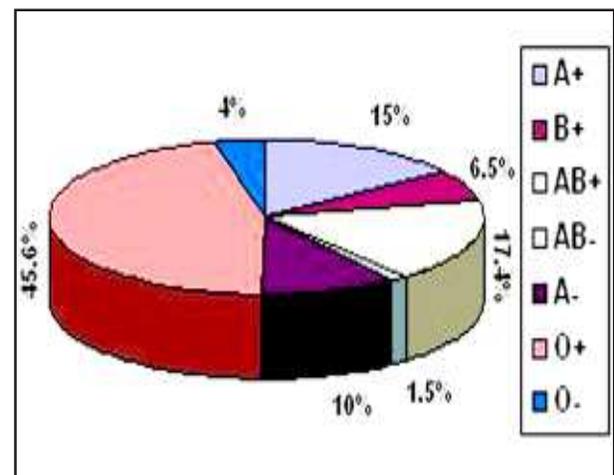


Fig-2: Frequency of blood groups in patients with 3VD

obese patients with coronary artery disease can prevent development of disease and improve lipid levels in patients with hyperlipidemia.<sup>4,18</sup> Weight loss in obese patients has many advantages, hence health care personnel's should prevent and control obesity especially in patients with CAD. Emphasis on changing lifestyle and having physical activity is necessary.<sup>4,7</sup> Savage et al found that patients who participated in a weight loss program has higher improvements on weight loss, cholesterol level compared with control group.<sup>19</sup> As weight loss is very useful for CAD patients, we should be teaching to the patients about advantages of this rehabilitation. In the analysis of data from patients it was founded that the risk factors like hyperlipidemia, smoking and diabetes mellitus are commonest in patients with 3VD. Ahmad et al in their study revealed that the majority of patients (87%) were male and they had the risk factors of smoking (79%), hypertension (35%), diabetes mellitus (31%) and hyperlipidemia (19%).<sup>20,21</sup> The common risk factors in male patients were hyperlipidemia and smoking. Ishaq et al in a study found that smoking was the commonest risk factor among males.<sup>22</sup> This finding is similar to our study. Paise et al in the study in India showed similar risk factors such as smoking, hypertension, and diabetes.<sup>23</sup> In our study the level of lipids was very high and hyperlipidemia was first risk factor that is an alarm for our population especially in progressive CAD patients. Boden et al in the America showed that majority of patients (85%) were male also common risk factors profile was hypertension (68%) and diabetes (34%).<sup>24</sup> Majority of our patients had O+ blood group that is higher than public population and need more research about role of type of blood group in progression of CAD. It is very noticeable that the risk factors like hyperlipidemia, smoking and diabetes mellitus are very common in 3VD which contribute to morbidity and mortality as well as an economic burden for patients and society. Identifying and control of risk factors in CAD patients can prevent from progression of disease. Controlling, modifying and treating these risk factors has proved to reduce mortality and morbidity in the CAD especially 3VD patients.<sup>4,8</sup>

One of the most important role of nurses and other health care givers are prevention. Primary prevention is education to the patients about identifying risk factors. Nurses should provide effective patient education on the reduction of CAD risk factors. Education about physical activity and having cardiac fitness with aerobic exercise are important.<sup>25</sup> Alexander et al in a meta-analysis found that secondary

prevention programs improve care of patients, coronary risk factors and quality of life.<sup>26</sup> Kutzleb et al revealed that nurse-directed patient education was effective in improving quality of life as well as modifying risk factors.<sup>27</sup> Education should focus on modification of risk factors for changing patient's lifestyle.<sup>4</sup> We should inform patients about adverse outcome of risk factors according to health belief model. Therefore, there is an urgent need to create more awareness about advantages of prevention and healthier life style in CAD patients.<sup>21</sup>

## CONCLUSION

This study showed that hyperlipidemia, smoking and diabetes are most important risk factors of CAD in three vessel diseases patients in Iran. Mean age of our patients in contrast with other studies is lower. Hence, patient health education about change of lifestyles like smoking cessation, healthy diet, exercise and weight loss program is necessary.

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