



ASSESSMENT OF NUTRITIONAL STATUS OF PATIENTS WITH ATHEROSCLEROSIS

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ABSTRACT:

OBJECTIVE: The present study was conducted to assess the nutritional status of patients with atherosclerosis.

MATERIALS AND METHODS: A Sample of 50 male and 50 female patients was taken from the Punjab Institute of Cardiology, Lahore in the time period of 4 months. Questionnaire was filled by asking them the questions about their dietary and physical activity pattern, lipid profile was also assessed.

RESULTS: The study found that most of the patients were not keen to do exercise on regular basis nor they were consuming a balanced diet. 51.43% patients were consuming ghee as a part of their daily diet which in turn increased their caloric intake i.e. 47.15% patients were consuming more than 2000 kcal/day while having a sedentary life style with no or little physical activity. 57.14% of the sample fell into the over-weight category and were at risk of developing CVDs because 51.43% had little physical activity but not enough to prevent the risk for chronic diseases. Most of them had abnormal lipid profile i.e. 58.57% had high levels of cholesterol and only 25.71% had normal levels of HDL-cholesterol which has a protective effect against heart diseases. Almost all patients showed some clinical signs and symptoms related to atherosclerosis.

CONCLUSION: It is concluded from this study that consumption of fat in form of ghee was high among these patients. Consumption of whole grains, fruits and vegetables were not according to the recommended servings. The group of patients surveyed consume fruits occasionally. Physical activity was not in the routine life of these patients.

KEY WORDS: Atherosclerosis, plaque, hypertension, hypovitaminosis C, HDL, LDL.

INTRODUCTION:

Atherosclerosis is a disorder usually caused when fat, cholesterol, and other substances build up in the walls of the arteries and form plaques. These plaques can block the arteries slowly causing problems throughout the body including heart^{1,2}.

Restricted flow of blood can damage the organ or its function. If a plaque ruptures it can cause a blood clot which stops the flow of blood towards heart or brain thus causing a heart attack or stroke.

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Exactly how arteries become clogged is not clear but there are certain things which increase the risk of atherosclerosis which include: smoking, high fat diet, lack of exercise, obesity, hypertension, elevated cholesterol levels^{3,4}.

Arteries become hard with age so people over 40 are at greater risk of developing this disease. Atherosclerosis (and resulting cardiovascular diseases) is a single major cause of death in developed world, accounting for one in three of all deaths⁵.

Throughout the world occurrence of this disease is very high. 17 million deaths due CVDs have been recorded. 32 million reports of heart attacks and stroke draw attention to this epidemic. Almost 85% of the global mortality and disease burden from CVDs is borne by low and middle income countries. Based on self-reporting data by WHO, 2004, sampled population of Karachi reported a history of 1.9% of the affluent and 0.6% of the poor in CVDs (atherosclerosis related diseases). A recently conducted survey showed 26.9% prevalence in men and 30% in women above 40 years. (World Health Organization, 2004)^{6,7}.

Researches show that different factors are in-

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volved in the development of atherosclerosis and cholesterol metabolism. Which includes social stress, excessive intake of calcium, hypovitaminosis C, use of Trans fatty acids and lipoproteins etc .

As diet is closely related to the risk of developing atherosclerosis, dietary patterns, and physical activity may be the part of reason causing this disease. A person taking high fat content with less or no physical activity for a long period of time is likely to be at more risk of developing atherosclerosis than those whose diet is moderate in fat content. There are two types of fats LDL and HDL. LDL or low density lipoproteins are bad fats as they tend to accumulate in the arteries while HDL or high density lipoproteins are the good fats which carry cholesterol back to the liver^{8,9}.

METHODOLOGY:

The study population consisted of atherosclerotic patients with first MI and elevated lipid profile. 50 male and 50 female patients with age ranged 50-75 years, were selected from OPD of Punjab Institute of Cardiology, Lahore. The sampling technique of this research was two staged sampling. First it was purposive sampling because the sample must be of heart patients suffering from atherosclerosis. And then patients were selected systematically by Kth number according to the eligibility criteria and evidence of the disease.

Interview schedule was used for collecting the information from the selected sample. Patient were observed and asked questions by the researcher. Questionnaire was developed by keeping in mind the objectives of the study. The questionnaire covered information including patient's age, gender, and medical history. Patient's information regarding the presence of any food allergy or intolerance, and eating disorder was collected, to have an idea of patient's general health status. Height and weight of patients was taken at the time of data collection with standardized techniques. The measurements include height, weight, waist circumference, and hip measurement. From this information BMI and waist to hip ratio was calculated to evaluate the risk factors for development of cardio-vascular diseases.

For clinical analysis the patients were observed and asked questions for each specific clinical sign and symptoms with special reference to atherosclerosis and CVDs. Apart from these symptoms patients were also observed for symptoms of any nutritional deficiencies. Under biochemical assessment fasting lipid profile was assessed along with CPK, CkMB, blood glucose and blood pressure.

Exercising pattern including the type of physical activity, duration and regularity was also noted. Data was analyzed using Statistical Package for Social Science (SPSS). Frequencies and percentages were calculated.

RESULTS:

Out of 100 cardiac patients, 50(50%) patients were male and 50(50%) were female. The trend towards high cholesterol level was slightly similar

Table-1 : Demographic variables of study population

Variables	Male (n=50)	Female (n=50)	P-value	
Cholesterol	Border>145	16%(8)	12%(6)	0.8437
	High>150	58%(29)	60%(30)	
	Normal<145	26%(13)	28%(14)	
Triglycerides	Border>145	6%(3)	28%(14)	0.0128
	High>150	78%(39)	44%(22)	
	Normal<145	16%(8)	28%(14)	
Fat	Both	26%(13)	22%(11)	0.4653
	Ghee	46%(23)	58%(29)	
	Oil	28%(14)	20%(10)	
Type of Meat Consumed (caloric intake)	1800	24%(12)	0	0.001
	2000	28%(14)	34%(17)	
	2200	48%(24.28)	46%(23)	
	2500	0	20%(10)	
BMI	Normal< 24	0	28(14)	0.001
	Over>25	52%(26)	62%(31)	
	Obese>30	48%(24)	10%(5)	
Waist and hip ratio	Border Line M = 0.87 to 0.9 F = 0.85 to 0.87	0	14%(7)	0.001
	High M: > 0.92 F:>0.90	38%(19)	0	
	Moderate M: > 0.90 F:>0.87	62%(31)	22%(11)	
	Normal M: < 0.87 F:<0.85	0	64%(32)	

in both genders. (58% vs. 60%). Triglycerides level was higher in male as compared to female (78% vs. 44%) .

Female gender commonly take ghee in their diet (58% vs. 46%). obesity is found to be high in male (48% VS. 10%) while females were found to be more overweight as (62% VS. 52%). High waist and hip ratio is significantly associated with male gender. (38% vs. 0)

DISCUSSION:

Diet and physical activity plays a very important role in heart's health. Fatty food intake or excess intake of food puts burden on the body's metabolism which results in increased blood cholesterol and triglyceride levels. People who consume ghee in their diet as a source of fat tend to get the disease more quickly than the others who consume oil. Type of meat consumed also adds extra fat and calories in the diet which again is not good



for the heart health.

Excess calories on the other hand cause obesity which is also a root for many other health problems. Obesity may damage blood arteries which results in blood clotting and deposition of fat where the blood clot forms and it interferes with blood flow and causes heart problems. Excess carbohydrates and proteins also convert in excess fat in the body and possess same threat as excess fat does.

Present study showed that high cholesterol was not different in both gender (58% vs. 60%). Roever LS⁹ et al determined that cholesterol was an independent risk factor for atherosclerosis in female gender (44.8% vs. 36.5%).

Present study reported that Triglycerides (mg/dL) were more associated with male gender (78% vs. 42%). Roever LS⁹ et al analyzed that Triglycerides (mg/dL) was associated with male gender (40.3% vs. 24.4%). Present study showed similar results.

Ghee considered to be associated with atherosclerosis, but data confirming these relations in women and men have been lacking. Present study reported that female gender significantly consumes ghee high in their diet as (58% vs. 46%). Roever LS et al examined that male gender commonly take ghee in their diet (6.8% VS. 4.9%)⁹ as compared to female .

Present study showed that more female were overweight and more male were obese. Roever LS et al reported similar results showed that obesity was more commonly observed in male as compared to female, the contradiction may be due to bias in selection of female patient.

Roever LS⁹ et al reported that waist and hip ratio was high in female 69.3% vs. 55.7% as compared to male. Present study showed that high waist and hip ratio was significantly associated with male gender. (38% vs. 0). Present study showed dissimilar results.

Physical activity and exercise puts a protective effect on heart as well as overall health. It helps to burn excess fat and calories. It also helps to reduce weight and lowers bold cholesterol levels and increase a HDL level which is protective for heart. Even a light exercise makes a large difference in relieving some of the symptoms like irregular heartbeat, shortness of breath etc.

A study by Harvard team demonstrated that those mice which were placed on a low carbohydrate/high protein diet showed significant increase in the atherosclerosis¹⁰.

Smoking is hazardous to health and a study revealed that smokers had more percentage of

atherosclerotic lesions than non-smokers. They also had other complications like hypertension, diabetes, and dyslipidemia. This study concluded that smokers tend to have significantly high multi-vessel disease.

Some other studies showed that consumption of saturated fat more than the recommended amount induces atherosclerosis. While consumption of HDL and PUFA, omega 3 and 6 decreases the prevalence of the disease¹¹.

Research work by Bowles et al showed that physical activity benefits arterial stiffness and regular exercise prevent development of atherosclerotic lesions. According to the results regular exercise slowed the progression of atherosclerosis by reducing plaque formation by 30%, stabilized the plaques by decreasing inflammation in the arteries, and increased smooth muscle cells by 58% making the plaque less likely to rupture¹².

All the previous work done related to atherosclerosis was about smoking or consumption of saturated fat in relation to the disease. The present study concluded that faulty eating habits and sedentary life style does play a role in the progression of atherosclerosis but it does not cause the disease. It will take too much time for diet to develop atherosclerosis. The diseased condition can be controlled through changes in diet and physical activity pattern but it cannot completely cure the condition. Medications along with dietary modification is necessary for treatment of atherosclerosis.

CONCLUSION:

It is concluded from this study that consumption of fat in form of ghee was high among these patients. Salt and spice content of the food was also high. Despite the fact that fat and spices are not good for health people like to consume them because without ghee and spices food is not palatable and it does not look good.

Consumption of whole grains, fruits and vegetables were not according to the recommended servings. The group of patients surveyed consumes fruits occasionally, some because of affordability and other said that fruits are for children and sick. Physical activity was not in the routine life of these patients. When they were asked to include a 30-40 minutes' walk in their daily routine, they thought it as a burden and said that they do enough walking while doing daily activities.

RECOMMENDATIONS:

On the basis of this study we strongly recommend that consumption of fruits and vegetables should be increased by creating awareness. Whole



grains and pulses should be consumed. People should know the difference between excess fat consumption and recommended amount of fat. Awareness about portion size must be created by educating people at every level. Physical activity

and healthy life style should be promoted in an easy and understandable way. There should be food security for everyone and food items should be in affordable range of low socio economic people as well.

Author's Contribution

HA: Conducted the study and wrote the article. SS: Helped in conducting the study and was research advisor. HM: Hospital administrator. SK: Helped in re-arranging data. MI: Re-arranging data and Tables.

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