ORIGINAL RESEARCH PAPER

Home Science

NUTRITIONAL ASSESSMENT AND ASSOCIATED RISK FACTORS OF PATIENTS WITH DYSLIPIDEMIA IN CARDIOVASCULAR DISEASES, KIM'S HOSPITAL, SHEELA NAGAR, VISAKHAPATNAM

KEY WORDS: Dyslipidemia, Hypercholesterolemia, Hypertriglyceridemia, CVD

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ABSTRACT

Dyslipidemia is one of the major risk factor for cardiovascular disease. Cardiovascular disease (CVD) is a chronic disorder and can lead to mortality. Atherosclerosis is the thickening and narrowing of the arteries; it is due to the formation of plaque in the arteries, which restricts blood flow into various organs. Dyslipidemia denotes elevated levels of one or more types of lipids in the blood. It is an observational study. Study includes 100 samples of age group 30-70 years, of which 50% of the population was female and 50% of the population was male. The samples were collected from KIMS hospital Sheela nagar. Study includes patients with CVD (cardio vascular disease), hypertensive patients, and diabetic patients. Anthropometric measurement, Biochemical parameters, clinical parameters, dietary intake was assessed by 24hours recall method and diet counselling was given. A questionnaire is framed and the data is collected with the help of the questionnaire. The data in the questionnaire includes the general information, patient's food habits, his interest and habits. Food preferences and likes and dislikes were collected from the patients itself. From the population 32% females, 38% males have the habit of walking daily, 5% males have the habit of running, 3% females and 6% males have the habit of yoga, 15% females and 1% males doesn't have any of this habit. From the population 11% males consume alcohol, 2% males smoke, 21% males have both the habits, and 16% males don't have any of the habit. Females are having high levels of cholesterol when compared to males, due to the sedentary lifestyle, whereas males are having high levels of triglycerides, LDL-C, VLDL-C, low HDL-C due to the consumption of alcohol, smoking.

INTRODUCTION

Dyslipidemia can be defined as abnormal levels of lipids which increases the levels of low-density lipoprotein cholesterol, serum total cholesterol, triglycerides and decreased serum high- density lipoprotein cholesterol. Dyslipidemia is a major risk factor for cardiovascular diseases and can lead to atherosclerosis, but this can be modifiable, atherosclerosis is the thickening and narrowing of arteries, where plaque is developed in the walls of arteries, which obstructs the blood flow. Elevated Total cholesterol levels can lead to cardiovascular diseases . Cardiovascular diseases are the major risk factor and causes of death in many developing countries. One of the main complications of dyslipidemia is cardiovascular diseases which can lead to myocardial infarction, cardiac stroke.

As dyslipidemia is modifiable, (80%) lipid disorders are related to diet and lifestyle, change in life style such as unhealthy diet, high fat and high calorie diet, performing physical activities can change the risk of dyslipidemia and can decrease the risk of cardiovascular diseases (7,4). Dyslipidemia can be a familial disorder, and can be a cause in the elevation of LDL-C (14,16). Hypertriglyceridemia is a condition where high amount of triglyceride is present in blood stream which can lead to atherosclerosis, mixed hyperlipidemia is a condition where high amount of LDL-C (low density lipoprotein cholesterol) and decreased levels of HDL-C (high density lipoprotein cholesterol) is present in the blood stream which can lead to myocardial infarction (8, 11). When it comes cholesterol, generally people think cholesterol is bad for you, it's not the same what you think, because even cholesterol perform many functions, but it depends on the levels of cholesterol presence in the body. Cholesterol acts as a precursor for the synthesis of vitamin- D, it also helps in synthesis of steroid hormones like progesterone, estrogen, and testosterone, it also helps in the production of bile and it maintains the fluidity of the cell membrane.

Triglycerides and Cholesterol are the main forms of fat present in the blood stream. These fats or lipids are obtained from food; some are produced by the liver. Fats are not water soluble, and cannot travel through the blood stream easily. So, they bound with the protein molecule and form lipoprotein and travel in the blood stream.

Objectives:

The main objectives of the study are to:

1) To understand the socioeconomic background of the patients.
2) To evaluate the dietary management.
3) To understand the BMI of the patients, to come to a conclusion of obesity.
4) To investigate the biochemical parameters.
5) To study the pattern of eating habits

METHODOLOGY

The present study entitled is an observational study of 100 samples of age group 30-70 years, of which 50% of the population were female and 50% of the population were male and samples were collected from KIMS hospital Sheela Nagar.

INCLUSION CRITERIA

All CVD cases, both males and females, age group between 30-70

EXCLUSION CRITERIA

Children, pregnant women, cancer patients, and other diseased patients except CVD related diseases.

A questionnaire is framed and the data is collected with the help of the questionnaire and interview method was scheduled to collect the information and to counsel the subjects. The data in the questionnaire includes the general information regarding socio economic status like monthly income, education, physical activity, occupation was recorded. Physical measurements like height, weight of the

patient was measured, and BMI has been calculated. BMI is done to categorize the individual into underweight, normal weight, overweight and obese. Patient's food habits, his interest and habits. Food preferences and likes and dislikes were recorded. Clinical and biochemical parameters were recorded

A 24-hour diet recall is a dietary assessment tool that consists of a structural interview in which patients were asked to recall all food and drinks they have consumed in the previous 24 hours. Patient's food preference, likes and dislikes, intolerant to any food data was also collected.

Diet counseling is done to all the patients. First oral counseling is done and then diet charts were given to the patients. We modified the diet of the patients with high lipid profiles. Suggestions on fenugreek seed powder to include in the patient's diet daily in any form. Diet with high amount of fiber, low fat foods, moderate protein, moderate carbohydrate, foods rich in omega 3 and omega 6 fatty acids were suggested.

The primary data was entered in Microsoft Excel spread sheet, and the variables were analyzed by using mean, frequency, percentage.

RESULTS

Socio-Economic Background:

From the 100 samples, 50% were males and 50 % were females of age group between the age group of 30-70 years. Fig 2 explains 39% females and 42% males are literates and 11% females and 8% males are Illiterates. Occupational status of the samples includes 22% females and 39% males were working, 20% females are homemakers, 8% females and 11% males are retired. Income status of the samples include 13% females and 12% males are under low-income group, 29% females and 21% males are under middle income group, 8% females and 17% males are under high income group.

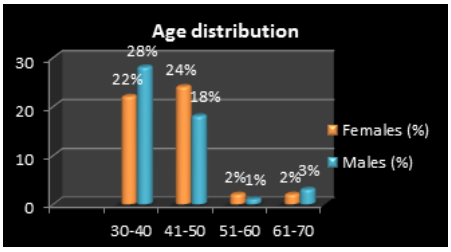

Fig 1: Age distribution among female and male

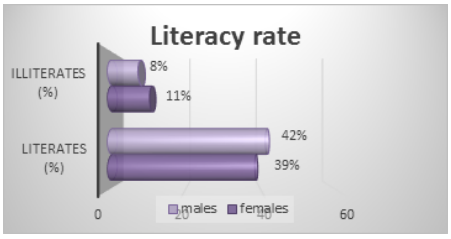

Fig: 2: Percentage of literacy rate among females and male

Biochemical Parameters

From the below table the cholesterol levels shows 25% females and 30% males are under normal category, 17% females and 13% males were at borderline, 8% females and 7% males are at higher risk. Triglyceride levels include 27% females and 22% males are under normal category, 13% females and 8% males was at borderline, 10% females and 19% males are having high levels of triglyceride level, and 1 % male is having very high amount of triglyceride levels. LDL-C levels include 15% females and 23% males are at optimal stage, 13% females and 8% males are at above optimal stage, 10% females and 10% males are at borderline, 11% females and 3% males are having high levels of LDL, 1% female and 6% male are having very high levels of LDL. HDL-C levels include 16% females and 24% males are having low levels of HDL, 28% females and 24% males are having normal levels, 6% females and 2% males are having high levels of HDL. VLDL levels include 20% female and 19% male are at normal level, 30% female and 31% male are having high levels of VLDL. High levels of Total cholesterol were found in majority of females than in males, due to obesity, lack of physicals activity, consumption of fried and fast foods. High levels of TC, TG, LDL, low levels of HDL were found in majority of males due to consumption of alcohol, smoking, consumption of fast food, red meat, obesity, diabetes.

Symptoms like SOB (shortness of breath), chest pain was found in the population.

Table 1: Baseline Characteristics of Dyslipidemia

LIPID PROFILES	RANGES	FEMALES (%)	MALES (%)
Total Cholesterol	Normal <200mg/dL	25	30
	Borderline 200-239 mg/dL	17	13
	High 200-239 mg/dL	8	7
Triglyceride	Normal <150mg/dL	27	22
	Borderline 150-199mg/dL	13	8
	High 200-499mg/Dl	10	19
	Very High > 500mg/Dl	0	1
LDL	Optimal <100mg/Dl	15	23
	Above optimal 100-129 mg/Dl	13	8
	Borderline 130-159 mg/Dl	10	10
	High 160-189mg/dL	11	3
	Very high > 190 mg/dL	1	6
VLDL	Normal 1-30 mg/dL	20	19
	High > 30mg/Dl	30	31
HDL	Low <40 mg/dL	16	24
	Acceptable 40-59mg/Dl	28	24
	High >60 mg/dL	6	2

Risk Factors

The study explains that 30% of females were hypertensive, and majority of the males were both diabetic and hypertensive. 21% of Males consume both alcohol and smoke which can be a major risk factor for dyslipidemia. 20% of Grade I obesity was found in majority of the males and Grade II and III obesity was found in very few of the females.

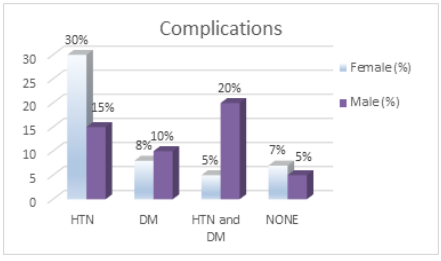

Fig 3: Percentage of complications among females and males

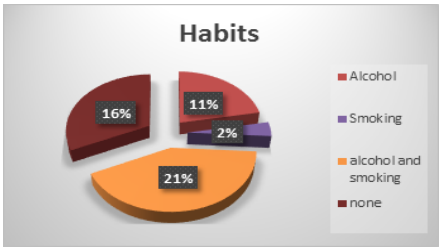

Fig4: Percentage of other habits among males from the population

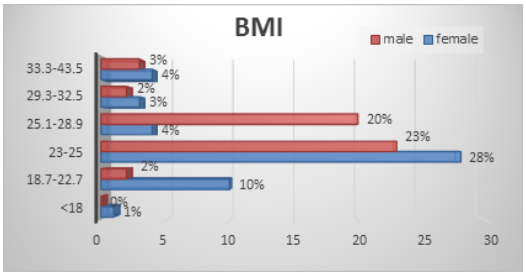

Fig 5: Percentage of BMI among female and male

Physical Activity:

From the fig 6 it states that 32% females, 38% males walk daily, 5% males have the habit of running, 3% females and 6% males have the habit of yoga, 15% females and 1% males doesn't have any of this habit. Due to lack of physical activity and sedentary life style patterns most of the subjects were obese.

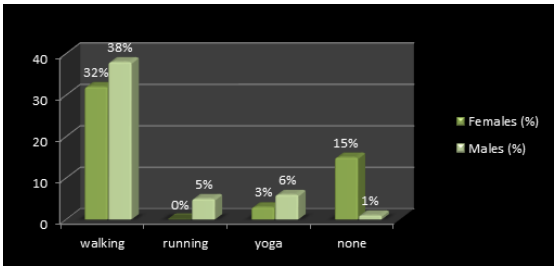

Fig 6: Percentage of physical activities among females and males

Dietary Assessment:

From the food frequency questionnaire 95% of the sample group were non vegetarian and 5% were vegetarian. Cereals were consumed by 90 % of the population, pulses were consumed by 55% of the population daily, egg is consumed by 38% of the population daily, milk, GLV, vegetables, fruits are consumed by 35%, 32%, 58%, 38% daily respectively, fish, chicken, meat are consumed by 21%, 32%, 19% daily. Nuts are consumed by 38% of the population daily and 23% of the population never consumed nuts; fast foods are consumed by 41% of the population daily. Fast foods, processed food and fried foods were consumed by majority of the population daily which increases the cholesterol level.

Table 2: Food frequency table

Foods	Daily	Weekly	Weekly Twice	Monthly	Monthly Twice	Never
Cereals	90	2	8	0	0	0
Pulses	55	12	20	4	9	1
Egg	38	20	24	6	10	2
Milk	35	11	19	16	9	10
Glv	32	19	21	9	19	0
Vegetables	58	6	18	4	14	0
Fruits	38	14	24	10	14	0
Fish	21	13	22	18	22	4
Chicken	32	17	28	9	9	5
Meat	19	21	17	18	16	9
Nuts	38	15	11	7	6	23
Fast Foods	41	15	18	9	11	6
Processed Foods	51	13	22	4	10	0
Fried Foods	33	19	21	13	10	4
Millets	49	6	12	13	11	9

DISCUSSION

Adrian Rosada, Ursula Kassner et al. done research in hyperlipidemia in elderly patients a cross- sectional study composed of total 2151 subjects (1657 are the elderly group of mean age 69 and 494 are the younger group of mean age 29), and the study concluded that the prevalence of hyperlipidemia was more found in the elderly group (76%) compared to the young group (41%). Hypercholesterolemia was found in majority of the population (64%). And the study concluded that prevalence of dyslipidemia increases with age.

Pengfei Ge, Caixia Dong et al. research done in The high prevalence of Low HDL- Cholesterol levels and Dyslipidemia in rural populations in Northwestern China concluded that, Literacy rate was very low, approximately two-fifths of the participants had elementary school education or no formal education, 43% attended secondary school, and 17% had tertiary education. Males had higher education attainment (22.9%) than females (12.1%). Obesity was found in majority of males than in females due to consumption of alcohol, fried foods. The prevalence of low HDL-C was 67.6% in males and 55.4% in females. Smokers and obese people are more likely to have low HDL-C and the study concluded that smoking, consumption of alcohol and obesity are the major factors for low HDL-C in Chinese adults.

Yousef S. Khader BDS et al, research done in prevalence of Dyslipidemia and its associated factors among Jordanian adults concluded that the population of the study composed of 1121 members (394 men and 727 women) of aged 25 years, mean age of the population was 46.2. Age group of 40-49 years had high levels of TG. TC and LDL-C were found higher with the age increases. 48.8% had high TC level, 40.7% had high LDL, 40.1% had low HDL, 43.6% had high triglyceride level and 75.7 % had at least one abnormal lipid level, and the study concluded that men have high triglyceride and low HDL-C than women when compared. Factors include smoking, consumption of alcohol, complications like hypertension and diabetes.

Xingang Zhang research done in prevalence of dyslipidemia and associated factors among the hypertensive rural Chinese population concluded that the prevalence of dyslipidemia was very high among hypertensive patients, and there are modifiable risk factors for dyslipidemia such as hypertension, weight and impaired glucose metabolism.

Kyueun Lee, Jihye Kim research done in The effect of smoking on the association between long-term alcohol consumption and dyslipidemia in a middle-aged and older population concluded that then study population is of 4467 members (1866 men and 2601 women) of age 40-69 years without dyslipidemia were chosen. After 12 years of follow-up, 64.3% participants developed dyslipidemia. In nonsmoking men and moderate consumption of alcohol are associated with low risk of dyslipidemia, whereas smokers and long-term alcohol consumption developed severe dyslipidemia.

Xuhong Hou et al. research done in Impact of waist circumference and body mass index as a risk factor for cardiovascular diseases concluded that the population of the study were 46,024 participants of age >20. The prevalence of central obesity was 29% in men and 25.2% in women. The prevalence of overweight and obesity was 33.7% and 13.7% in men, and 29.2% and 10.7% in women. Central obesity, overweight and obesity are the main reasons for CVD.

Zhou J, Zhou Q, Wang DP et al, research done in Association of sedentary behavior and physical activity with dyslipidemia concluded that the population of the study include 11373 participants of age 18-79 years. From the population physical activity of the people include, low level physical activity, moderate and high-level physical activity were 23.43%, 37.29% and 39.28%. And the study concluded that sedentary behavior increased the risk of dyslipidemia and concluded that including physical activity can reduce the risk of dyslipidemia.

Wafaa Y Abdel Wahed, Khalid Ei- Khashab et al research done in Prevalence of Dyslipidemia among healthy university students: Fayoum governorate, Egypt. A descriptive cross-sectional study was conducted on a group of 384 students. The prevalence of Dyslipidemia was 63.8%, prevalence of hypercholesterolemia, Hypertriglyceridemia, low HDL-C, high LDL-C was 38.8%, 29.7%, 27.1% and 33.1%. And the study concluded that factors associated with Dyslipidemia were overweight and obesity, abdominal obesity, consumption of fast food and low fruit and vegetable consumption. Introducing healthy life style and good diet can help to overcome dyslipidemia.

CONCLUSION

The study concludes that among 100 study subjects, 50% were females and 50% were males of age group 30-70 years. The mean age value of females is 52.8 and for males it is 50.9 and the median is 54 for females and 48.5 is for males. Prevalence of dyslipidemia is found in majority of males than in females of age group 50-55 years. From the study it was concluded that Grade I obesity was found in majority of the males and Grade II and III obesity was found in majority of the females. Literacy rate was higher in males than in females. High levels of Total cholesterol were found in majority of females than in males, due to obesity, lack of physicals activity, consumption of fried and fast foods. High levels of TC, TG, LDL, low levels of HDL were found in majority of males due to consumption of alcohol, smoking, consumption of fast food, red meat, obesity, diabetes. Majority of the females were hypertensive. Diabetes mellitus was found in majority of males, both hypertension and diabetes were found in majority of males. Smoking and consumption of alcohol is seen in majority of the males. Physical activity is low in females than in males which can be a reason for obesity in females. Many of the patients were diagnosed with MI (myocardial infarction) and the symptoms include SOB and Chest pain. Diet counseling is given to the patients. Foods's rich in MUFA and PUFA, high fibre foods and regular exercise or any type of physical activity were suggested to overcome dyslipidemia and further cardiovascular diseases.

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Conflict of interest:

No conflicts of interest is declared by the author.

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