Study on serum lipoproteins variation in smokers and non-smokers of Hyderabad.

Shakoor A. M [1], Qasmi Rasheeda[2] , Pathan I [3]

Abstract:

Objective: The study was conducted at territory of Hyderabad during 2004. 25 smokers and 25 non-smokers of 20-40 years of age were interviewed and were clinically evaluated before taking blood samples. The smokers were requested to come in fast for 14 hours except plain water. Their blood sample was collected from anterior cubital vein. After centrifugation, the serum was separated for paper electrophorectic analysis for lipoprotein bands. Results revealed average HDL, LDL, VLDL, Triglycerides and total cholesterol in the blood of smokers were 31.5-38.5, 126-134, 31.5-34.5, 175-225 and 260-280 respectively mg/dl and in non-smokers were 39.0-43.0, 105-115, 22-28, 69-140 and 140-200 mg/dl respectively. There was significant (p<0.001) difference in lipoproteins were observed among smokers and non-smokers. It was concluded that the reciprocal variation was seen in circulating lipoproteins. The level of HDL decreased while LDL and VLDL increased along with Triglycerides and total cholesterol.

Keywords: Serum lipoproteins. Atherosclerosis Coronary heart diseases, Lipoprotein-Electrophoresis.

Introduction:

Lipoproteins are the complexes containing specific proteins, phospholipids, cholesterol, triglycerides and cholesterol esters and they are sub-divided in to different classes based on size and density 1 (Zubay, 1988) and their variation in blood may lead to many health problem due to inherited metabolic disorders, life style variation, pregnancy, oral contraceptive drugs and smoking. Health hazards due different types of smoking are one of the great health issues through out the world. The Active smoking of different material e.g., heroin cocaine etc develop addiction due to their effects on central .nervous system **(2004).** Tabacco cigarette smoking is profoundly an addictive , which leads to numerous health problems depending upon the dose and the duration of smoking. Cigarette smoke consist numerous toxic substance which in the body under go metabolic modification resulting in to increase in the circulation toxin substances and their metabolic intermediates / end products.

By smoking , the lipoproteins levels in blood become affected and premature death with the cardiac cause is seen in the smokers , on the above hypotheses, the present study is .therefore, designed to evaluate variation in HDL,LDL,VLDL, Triglycerides and total cholesterol in the blood of smokers and comparison with non-smokers of Hyderabad.

Material and Method: The study was conducted at territory of Hyderabad during 2004. 25 smokers and 25 non-smokers of 20-40 Year of age of Hyderabad were interviewed and their symptoms were also noted before taking blood samples. The smoker was requested to come in fast for 14 hour except plain water. Their blood sam-

1. Muhammad Medical College, Mirpurkhas.
2. Muhammad Medical College, Mirpurkhas.
3. Muhammad Medical College, Mirpurkhas.

ples were collected from cubital vein using the disposal syringes and than the samples were placed in plain bottle. After centrifugation, the serum was separated for paper electrophotacic analysis for lipoprotein bands. Triglycerides and total cholesterol were measured by spectrophotometer. Detection of serum lipoprotein was performed according to the method of **Lees and Hatch , 1963** by using Whatman No: I Paper as medium, albumin barbital buffer, applying 120V for 16 hours, followed by staining with Oil Red O by the method of **Naito and Lewis 1973**, distaining and densitometry. The following parameters were studies before and after collection of blood samples:-

1. Age
2. Socio-Economic Status of Smokers
3. History of Smoking
4. Symptom and Signs
5. Clinical Examination
6. Level of Lipoproteins
7. Level of Triglycerides
8. Level of Total Cholesterol.

Result and Discussion:

The results on changes of serum lipid profile in smokers and non - smokers of Hyderabad are presented in Table 1 - 6. Results revealed that there were 25 smokers and same numbers of non-smokers were studied, out of which 13 smokers were belongs to age of 20 - 30 years and 12 were 31-40 years. Among non - smokers there were 15 of 20-30 years and 10 were having 31-40 years of age (Table-1). The average income of smokers and non-smokers was observed Rs. 1250-67000 and Rs. 3000 - 32000 per month. There were 6 smokers were in Government service, 15 in private jobs and 4 were illiterate. 18 smokers were married and 7 were un-married. Among non - smokers, 9 were in

Government service, 14 in private Jobs and 2 were jobless with their family size of 12-13 members. 16 smokers were literate and 9 were illiterate. 21 were married and 4 were un-married (Table-2).   The history of smoking shows in Table-1 that 7 smokers had been smoking since 5 years, 6 since 10 years and 12 since 15 years. Among 25 smokers, 4 using up to 15 cigarettes per day, 10 up to 30 cigarettes and 11 up to 45 cigarettes. The symptoms of smokers and non-smokers were within the normal range in exertional dyspnea, general built, palpitation, blood pressure, irritability in behavior, fatigue, and memory. The result of the routine investigation of X-rays, ECG, Blood CP, Blood ESR and Urine DR were also within the normal range of both respondents (Table-4). These findings are in agreement with the findings of **Joaquin 2005, Carlos et at, 2001, Sach and Hall, 1981, Sachs, 1984** they reported that symptoms and routine investigations could be same in smokers and non-smokers. The results of HDL, LDL and VLDL in smoker were 31.5 - 38.5, 126 - 134 and 31.34.5/ mg/dl and 39.0 - 43.0, 105 - 115 and 22 - 28 were recorded in non - smokers of Hyderabad. The 7.5 - 4.5 difference in HDL, 21 - 19 in LDL and 8.5 - 6.5 mg/dl in VLDL were calculated. These results show significant (P<0.001) difference in smokers and non-smokers and 106 - 140 mg/dl level of triglycerides were observed in non-smokers and also 106 -85 differences was also measured. These results show significant (P<0.001) difference in smokers and non-smokers. These findings are in agreement with the findings of **(Anonymous, 2006)** who reported that level of triglycerides in blood increases in smokers. 260 - 280 mg/dl in smokers and 140 - 200 mg/dl level of total cholesterol were noted in non-smokers and 120 - 80 differences was also calculated. These results show significant (P<0.001) difference in smokers and non-smokers. These findings are in agreement with the findings of **(Jonathan et al 2003)** they reported that level of total cholesterol in blood increases in smokers.

Conclusion:

It was concluded from the present study that the reciprocal variation was seen in circulating lipoproteins. The level of HDL decreases while LDL and VLDL increases along with triglycerides and total cholesterol and these variations will lead to atherosclerosis in smokers. It was further concluded that the changes in smokers of 10 cigarettes in day was low/high as compared to smokers of 5 cigarettes, the high changes were recorded in service / jobless, married / unmarried and in educated / uneducated smokers were as low variation in service / jobless, married / unmarried and in educated / uneducated smokers.

Recommendations.

1. Quitting of smoking followed by certain change in life style is the only way to seek prevention from such grievous risk factors.
2. Smokers are advised that proper investigations be conducted regularly.

3. Quitting smoking will prevent others from being passive smokers developing similar health hazards.
4. Further studies be conducted to evaluate the cardiac markers, tumor markers, social problems, and genetic mutation in smokers.

Table-1 .Age of smokers and non-smokers

Respondents	20-30 Years	%	31-40 Years	%	Total
No.of Smokers	13	53	12	47	25
No.of non-Smokers	15	60	10	40	25

Table-2. Socio-economic status of smokers and non-smokers.

Respondents	Av. Income Rs. ; / p m	Service (Nos)			Family Size (Nos)		Education		Marital Status	
		Govt.	Private	Jobless	1-10	11-20	Literate	Illiterate	Married	Un-Married
Smokers	1250-67000	6	15	4	8	17	11	14	18	7
Non-Smokers	3000-32000	9	14	2	12	13	16	9	21	4

Table -3. History of Smoking.

Table-4 clinical evaluation of smokers and non-smokers.

Duration				Smoking pattern			
Smoking period (years)	5	10	15	No. of Cigarettes per day	1-15	16-30	30-45
No. of respondents	7	6	12	No. of respondents	4	10	11

Table-5. Lipoproteins variation in smokers and non-smokers.

Particulars	Smokers	Non-Smokers
Excertional dyspnoea	Normal	Normal
General illness	Normal	Normal
Palpitation	Normal	Normal
Blood pressure	Normal	Normal
Irritability in behavior	Normal	Normal
Memory	Normal	Normal
Fatigue ability	Normal	Normal
X - Ray	Normal	Normal
ECG	Normal	Normal
Blood CP	Normal	Normal
Blood ESR	Normal	Normal
Urine DR	Normal	Normal

Table-6. Triglycerides Variation in smokers and non-smokers.

Particulars	Smokers	Non-smokers	Difference	P – Value
HDL (mg/dl)	31.5 – 38.5	39.0 – 43.0	7.5 – 4.5	0.001
LDL (mg/dl)	126 – 134	105 – 115	21 – 19	0.001
VLDL (mg/dl)	31.5 – 34.5	22 -28	8.5 – 6.5	0.001

Particulars	Smokers	Non-smokers	Difference	P-Value
Triglycerides	175-225	69-140	106-85	0.001

Table-7. Total Cholesterol Variation in smokers and non-smokers.

Particulars	Smokers	Non-smokers	Difference	P-Value
Total Cholesterol.	260-280	140-200	120-80	0.001

Reference:

1. Zubay .G.1988. Biochemistry .Mazwell Macmillan International. 866, Third Avenue .NewYork.pp-1266.
2. Ponto 2004. Effect of Acute Marijuana on Cardiovascular Function and Central Nervous System... J Clin Pharmacol . 44:751-766
3. Lees RS ,and Hatch FT.1963 Sharper seperation of lipoprotein species by paper electrophoresis in albumin containg buffer.JlabClinMed.1963:61:518-528.
4. Naito Hk., and Lewis LA.1973. Rapid Staining procedure for paper electrophoretogram.Clin   Chem : 19:106.
5. Jaoquin Bank A. G. Stanton.2005. Cardiovascular Effects of Secondhand Smoke. Circulation. 2005; 111:2684 – 2698
6. Carlos A. R. Jimenez, M. Fernando M. Marc, G. Rafael , L. Jose Luis, V. Carlos. 2001. Smoking Characteristics. Chest. 119:1365-1370.
7. Sach K and R.S. Hall. 1981. Success of rapid smoking theraphy in smokers with pulmonary and coronary heart diseases.Am Rev Respir Dis 123,111-116
8. Sachs,D, 1984.Treatment of cigratte dependency : What American pulmonary physicianc do.Am Rev Respi Dis 129,1010-1013
9. Maeda K,Y.Noguchi and T.Fukui.2003.The effects of cessation from cigratte smoking on the lipid and lipoprotein profiles: a meta-analysis.Prev Med .2003:37 (04):283-90
10. Anonymous. 2006. Risk Factors and Coronary Health Disease. American Heart Association. National Center, 7272 Greenville Avenue. Dallas, TX 75231.Acessed from:
http://www.americanheart.org/presenter.jhtmlidentifier=4726
11. Jonathan R Emberson, H.W. Peter W.M. Richard and W.May. 2003 Re-assessinng the contribution of serum total cholesterol, blood pressure and cigarette smoking to the   aetiology of coronary heart disease: impact of regresssion dilution bias. Europe heart journal.24 (19):1719-26