

Effect of Cigarette Smoking on Lipid Profile and Throat in Male Population Smoker of Mirpur AJK

Effect of
Cigarette
Smoking on
Lipid Profile and
Throat

Muhammad Shoaib¹, Faisal Bashir², Abdul Waheed Khan⁴ and Asnad³

ABSTRACT

Objective: The objective of this study to evaluate the effect of cigarette smoking on lipid profile and throat in male population smoker of Mirpur AJK.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Community Medicine, Biochemistry and ENT of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK from January 2018 to September 2019.

Materials and Methods: Only adult male smokers and non-smokers were selected for the study. Those smokers who were reported in other disease such as hepatic diseases, diabetes and hypertension were excluded. We take for study 200 chronic smoker and 100 non-smoker. This study was conducted in the department community medicine, Biochemistry Department and ENT of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take blood samples from both groups chronic smoker and non-smoker and analyzed the samples on Micro lab 300 for serum lipid profile. (Cholesterol, HDL, LDL, VLDL and Triglyceride). For the study we use kits made of Merck Pvt. We also done other biochemistry test and hematological test and throat were clinically investigated and observation was recorded. Smoking history and medical history are obtained from both groups such as smoker and non-smoker.

Results: The result indicate that all the lipid profile (LDL, Triglyceride) is higher except HDL in smoker with as compare to non-smoker. Total cholesterol (253.5 ± 11.8 mg/dl, LDL (126.9 ± 22.5 mg/dl, and Triglyceride (198.2 ± 31.5 mg/dl, in smoker are higher as compare to non-smoker. While HDL (39.77 ± 8.5 mg/dl, is decreased in smoker as compare to non-smoker.

Conclusion: It is concluding that tobacco smoking alter the lipid profile and throat flora of the chronic smoker. Quitting of smoking is essential for the reduction, the risk of CHD and atherosclerosis among the Mirpur, AJK smoker.

Key Words: smoking, lipid profile, throat

Citation of article: Shoaib M, Bashir F, Khan AW, Asnad. Effect of Cigarette Smoking on Lipid Profile and Throat in Male Population Smoker of Mirpur AJK. Med Forum 2020;31(9):54-58.

INTRODUCTION

Cigarette smoking is caused atherosclerosis and Chronic Heart Diseases (CHD).^{1,2} Tobacco smoke produce dangerous and toxic effect on throat, lipid profile and health.³ Many scientist reported that smoking effect biochemical process in the body such as changes in the lipid profile, decreased nitric oxide and increased LDL-C.⁶⁻⁸

Smoking produce the endothelial dysfunction which effect the body function.⁹ Smoking also developed insulin resistance in the body which effect the body glucose level.¹⁰ Fibrinolysis process is effect in body with time being smoking.¹¹ Hematology of the body is also change with smoking such as platelet dysfunction.^{12,13}

The viscosity of the blood is high with smoking and chances of inflammation is increased in smoker.^{14,15} Athero-thrombotic diseases is developed in chronic smoker.¹⁶⁻¹⁸ The lipolysis process is increased in daily smoker which increase the free fatty acid.¹⁹ Arterial wall inflammation disorder is produced in chronic smoker.^{20,21} Atherogenic factors are enhanced in chronic smoking such as Density Lipoprotein-Cholesterol (VLDL-C) and Very Low Density Lipoprotein-Cholesterol (VLDL-C).²² Previous scientist data showed that Tobacco smoking increased the level of VLDL, cholesterol, LDL-C and triglyceride.²³⁻²⁵ Some studies showed conflict to each other with lipid profile.^{28, 29} Cigarettes smoked is directly related to CVD development.^{32,33}

¹. Department of Community Medicine / ENT² / Biochemistry³, Mohtarma Benazir Bhutto Shaheed Medical College, Mirpur, AJK.

⁴. Department of Community Medicine, Poonch Medical College, Rawalakot, AJK

Correspondence: Dr. Asnad, Associate Professor of Biochemistry, Mohtarma Benazir Bhutto Shaheed Medical College, Mirpur, AJK.

Contact No: 0332-3698204

Email: drasnadkhan@gmail.com

Received: May, 2020

Accepted: July, 2020

Printed: September, 2020

The present study objective to evaluate the effects of smoking on lipid profile and throat among Mirpur AJK smokers.

MATERIALS AND METHODS

Only adult male smokers and non- smokers were selected for the study. Those smokers who were reported in other disease such as hepatic diseases, diabetes and hypertension were excluded. We take for study 200 chronic smoker and 100 non –smoker. This study was conducted in the department community medicine, Biochemistry Department and ENT of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take blood samples from both groups chronic smoker and non-smoker and analyzed the samples on Micro lab 300 for serum lipid profile. (Cholestol, HDL, LDL, VLDL and Triglyceride). For the study we use kits made of Merck Pvt. We also done other biochemistry test and hematological test and throat were clinically investigated and observation was recorded.

Smoking history and medical history are obtained from both groups such as smoker and non-smoker

For data analysis, the results were analyzed using the SPSS, version 20. Mean and standard deviation between groups were determined. For comparison, T-test was used for both group's smoker and non-smoker.

RESULTS

The result indicates that all the lipid profile (LDL, Triglyceride) is higher except HDL in smoker with as compare to non-smoker.

Table No.1: Participant characteristics

	Smoker (n=200)	Non- Smoker (n=100)
Age (years)	35.54 ± 5.58	35.55 ± 4.58
Education		
Basic	B-51%, S-	B-50% , S-
Secondary	29% , U-20%	32% U-18%
University		
Body weight (Kg)	75.1 ± 11.4	75.4 ± 11.5

B: Basic , S: Secondary , U:University

Table 2: Lipid profile of Chronic Smoker and non-smoker

Chronic Smoker (n=200)	non-smoker (n=100)
Fasting Blood Glucose(mg/dl)	
97.8 ± 4.3	99.4 ± 4.6
Total Cholesterol (mg/dl)	
253.5 ± 11.8	191.6 ± 31.5
LDL (mg/dl)	
126.9 ± 22.5	113.5 ± 17.3
HDL (mg/dl)	
39.77 ± 8.5	58.3 ± 9.1
Triglycerides (mg/dl)	
198.2 ± 31.5	132.3 ± 31.2

Total cholesterol (253.5 ± 11.8) mg/dl, LDL (126.9 ± 22.5) mg/dl, and Triglyceride (198.2 ± 31.5) mg/dl, in smoker are higher as compare to non-smoker. While HDL (39.77 ± 8.5) mg/dl, is decreased in smoker as compare to non-smoker. Minor irritation is caused by smoking on throat was observed in chronic smoker.

Table No.3: The risk of morbidity level among smokers and non-smokers

Lipid profile	Non-smokers N (%)	Smokers N (%)
Total cholesterol mmol/l		
Normal value	73.3%	58.9%
Moderate morbidity risk	26.0%	20.9%
High morbidity risk	2.9%	20.9%

Table No.4: Percentage irritations in throat among smokers and non-smokers

	Non-smokers	Smokers
Irritation %	10-15%	80-85%

DISCUSSION

Critical enzymes of lipid transport is changed with smoking, hepatic lipase activity is changed, and cholesterol ester transfer protein activity is changed.³⁵ In smokers compared to non smokers, level of HDL-C in serum is decreased.³⁶ In the another study, VLDL, triglyceride and LDL-C are increased in chronic smoker.³⁷

Only adult male smoker and non- smoker was selected for the study. those smoker who are reported in other disease such as hepatic diseases, diabetes and hypertension were excluded. We take for study 200 chronic smoker and 100 non –smoker. This study was conducted in the department community medicine, Biochemistry Department and ENT of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take blood samples from both groups chronic smoker and non-smoker and analyzed the samples on Micro lab 300 for serum lipid profile. (Cholestol, HDL, LDL, VLDL and Triglyceride). For the study we use kits made of Merck Pvt. We also done other biochemistry test and hematological test and throat was clinically investigated and observation was recorded .

Smoking history and medical history are obtained from both groups such as smoker and non-smoker The result indicate that all the lipid profile (LDL, Triglyceride) is higher except HDL in smoker with as compare to non-smoker. Total cholesterol (253.5 ± 11.8) mg/dl, LDL (126.9 ± 22.5) mg/dl, and Triglyceride (198.2 ± 31.5) mg/dl, in smoker are higher as compare to non-smoker. While HDL (39.77 ± 8.5) mg/dl, is decreased in smoker as compare to non-smoker. Some studies showed the lipid profile are same or normal in smoker but in chronic smoker the value changed ^{38,39} Strong predictor(non HDL fraction) for risk of CHD has increased in chronic smoker ^{40,42} In the study of Afroz et al., oxidative modification of LDLC is increased in chronic

smoker which is reported.⁴³ Levels of oxidized LDL-C is increased in smoker which is the risk of atherosclerosis and CHD.⁴⁴

The viscosity of the blood is high with smoking and chances of inflammation are increased in in smoker. Athero-thrombotic diseases is developed in chronic smoker. The lipolysis process is increased in daily smoker which increase the free fatty acid. Arterial wall inflammation disorder is produced in chronic smoker. Atherogenic factors are enhanced in chronic smoking such as Density Lipoprotein-Cholesterol (VLDL-C) and Very Low Density Lipoprotein-Cholesterol (VLDL-C). Previous scientist data showed that Tabaco smoking increased the level of VLDL, cholesterol, LDL-C and triglyceride. Some studies showed conflict to each other with lipid profile .cigarettes smoked is directly related to CVD development In one of study in rabbit, cigarette smoke extract when inject, it caused oxidative modification of LDL which atherosclerosis.⁴⁵

So it is conclude that tobacco smoking alter the lipid profile and throat flora of the chronic smoker.

CONCLUSION

So it is conclude that tobacco smoking alter the lipid profile and throat flora of the chronic smoker. Quitting of smoking is essential for the reduction, the risk of CHD and atherosclerosis among the Mirpur , AJK smoker.

Author's Contribution:

Concept & Design of Study:	Muhammad Shoaib
Drafting:	Faisal Bashir
Data Analysis:	Abdul Waheed Khan, Asnad
Revisiting Critically:	Muhammad Shoaib, Faisal Bashir
Final Approval of version:	Muhammad Shoaib

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Centers for Disease Prevention. Annual smoking-attributable mortality, years of potential life lost, and economic costs--United States, 1995-1999. *MMWR Morbidity and mortality weekly report* 2002;51: 300.
- Howard G, Wagenknecht LE, Burke GL, Diez-Roux A, Evans GW, et al. Cigarette smoking and progression of atherosclerosis: The Atherosclerosis Risk in Communities (ARIC) Study. *JAMA* 1998; 279: 119-124.
- National Center for Chronic Disease Prevention and Health Promotion (US) Office on Smoking and Health. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon

- General. Atlanta (GA): Centers for Disease Control and Prevention (US); 2014.
- Craig WY, Palomaki GE, Haddow JE. Cigarette smoking and serum lipid and lipoprotein concentrations: an analysis of published data. *Bri Med J* 1989;298:784-788.
- Joshi N, Shah C, Mehta HB, Gokhle PA. Comparative study of lipid profiel on healthy smoker and non-smokers. *Int J Med Sci Publ Health* 2013; 2: 222-226.
- Frei B, Forte TM, Ames BN, Cross CE. Gas phase oxidants of cigarette smoke induce lipid peroxidation and changes in lipoprotein properties in human blood plasma. Protective effects of ascorbic acid. *Biochem J* 1991; 277: 133-138.
- Mayhan WG., Patel KP. Effect of nicotine on endothelium-dependent arteriolar dilatation in vivo. *Am J Physiology-Heart and Circulatory Physiol* 1997; 272: H2337-H2342.
- Mayhan WG., Sharpe GM. Effect of cigarette smoke extract on arteriolar dilatation in vivo. *J Applied Physiol* 1996; 81: 5.
- Barua RS, Ambrose JA, Eales-Reynolds LJ, DeVoe MC, Zervas JG, et al. Dysfunctional endothelial nitric oxide biosynthesis in healthy smokers with impaired endothelium-dependent vasodilatation. *Circulation* 2001;104:1905-1910.
- Reaven G., Tsao PS. Insulin resistance and compensatory hyperinsulinemia: the key player between cigarette smoking and cardiovascular disease? *J Am Coll Cardiol* 2003;41:1044-1047.
- Newby DE, Wright RA, Labinjoh C, Ludlam CA, Fox KAA, et al. Endothelial Dysfunction, Impaired Endogenous Fibrinolysis, and Cigarette Smoking A Mechanism for Arterial Thrombosis and Myocardial Infarction. *Circulation* 1999;99: 1411-1415.
- Ichiki K, Ikeda H, Haramaki N, Ueno T, Imaizumi T. Long-term smoking impairs platelet-derived nitric oxide release. *Circulation* 1996;94: 3109-3114.
- Sawada M, Kishi Y, Numano F, Isobe M. Smokers lack morning increase in platelet sensitivity to nitric oxide. *J Cardiovascular Pharmacol* 2002;40:571-576.
- Tracy RP, Psaty BM, Macy E, Bovill EG, Cushman M, et al. Lifetime smoking exposure affects the association of C-reactive protein with cardiovascular disease risk factors and subclinical disease in healthy elderly subjects. *Arteriosclerosis, Thrombosis and Vascular Biol* 1997;17: 2167-2176.
- Bermudez EA, Rifai N, Buring JE, Manson JE, Ridker PM. Relation between markers of systemic vascular inflammation and smoking in women. *Am J Cardiol* 2002;89:1117-1119.

16. Kojda G, Harrison D. Interactions between NO and reactive oxygen species: pathophysiological importance in atherosclerosis, hypertension, diabetes and heart failure. *Cardiovascular Res* 1999;43: 652-671.
17. Nedeljkovic ZS., Gokce N., Loscalzo J. Mechanisms of oxidative stress and vascular dysfunction. *Postgraduate Med J* 2003;79: 195-200.
18. Ambrose JA, Barua RS. The pathophysiology of cigarette smoking and cardiovascular disease: an update. *J Am Coll Cardiol* 2004; 43: 1731-1737.
19. Benowitz NL, Fitzgerald GA, Wilson M, Zhang QI. Nicotine effects on eicosanoid formation and hemostatic function: comparison of transdermal nicotine and cigarette smoking. *J Am Coll Cardiol* 1993;22:1159-1167.
20. Tabas I, Williams KJ, Born J. Subendothelial lipoprotein retention as the initiating process in atherosclerosis update and therapeutic implications. *Circulation* 2007;116: 1832-1844.
21. Epstein FH, Ross R. Atherosclerosis-an inflammatory disease. *New Engl J Med* 1999;340: 115-126.
22. Stampfer MJ, Sacks FM, Salvini S, Willett WC, Hennekens CH. A prospective study of cholesterol, apolipoproteins, and the risk of myocardial infarction. *New Engl J Med* 1991;325: 373-381.
23. Mouhamed DH, Ezzaher A, Neffati F, Gaha L, Douki W, et al. Association between cigarette smoking and dyslipidemia. *Immuno-analyse & Biologie Spécialisée* 2013;28: 195-200.
24. Neki NS. Lipid profile in chronic smokersâA clinical study. *J Ind Acad Clin Med* 2002;3: 51-54.
25. Prabha V, Waheeda S, Meriton Stanly A. Effect of Tobacco Smoking on Lipid Profile. *Ind J Appl Res* 2015;5: 562-564.
26. Dirican M, Sarandol E, Ulukaya E, Tokullugil HA. Effects of smoking on serum lipid and lipoprotein concentrations and lecithin: cholesterol acyltransferase activity. *J Med Investigation* 1999;46:169-172.
27. Yan-Ling Z, Dong-Qing Z, Chang-Quan H, Bi-Rong D. Cigarette smoking and its association with serum lipid/lipoprotein among Chinese nonagenarians/centenarians. *Lipids in Health and Dis* 2012;11:1-6.
28. Aski BS, Kashinath RT, Hundekari IA. Effect of cigarette smoking on blood lipids. A study in Belgaum, Northern Karnataka. *Ind Global J Med Res* 2012;12:6.
29. Afshan A, Sugoor M, Swati IA, Patil RB. A hospital based study on lipid profile in smokers and non-smokers-a comparative study. *J Evolution Med Dental Sci* 2012;1:662-667.
30. Burns DM. Epidemiology of smoking-induced cardiovascular disease. *Progress in Cardiovascular Dis* 2003;46:11-29.
31. McBride PE. The health consequences of smoking. *Cardiovascular diseases. Med Clin North Am* 1992;76:333-353.
32. Cui Y, Blumenthal RS, Flaws JA, Whiteman MK, Langenberg P, et al. Non-highdensity lipoprotein cholesterol level as a predictor of cardiovascular disease mortality. *Archives of Internal Med* 2001;161:1413-1419.
33. Farwell WR, Sesso HD, BuringJE, Gaziano JM. Non high-density lipoprotein cholesterol versus low-density lipoprotein cholesterol as a risk factor for a first nonfatal myocardial infarction. *Am J Cardiol* 2005;96:1129-1134.
34. Panel National Cholesterol Education Program Ncep Expert. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. *Circulation* 2002;106:3143.
35. McCall MR, van den Berg JJ, Kuypers FA, Tribble DL, Krauss RM, et al. Modification of LCAT activity and HDL structure. New links between cigarette smoke and coronary heart disease risk. *Arteriosclerosis, Thrombosis, and Vascular Biol* 1994;14:248-253.
36. Ratnam PK, Kataraki P, Vontela AR. Comparison of Lipid Profile in Smokers and Non Smokers in and around Nalgonda, Andhra Pradesh. *Ind J Public Health Res Develop* 2014;5:120.
37. Reaven GM. Role of insulin resistance in human disease. *Diabetes* 1988;37:1595-1607.
38. He BM, Zhao SP, Peng ZY. Effects of cigarette smoking on HDL quantity and function: implications for atherosclerosis. *J Cellular Biochemistry* 2013;114:2431-2436.
39. Gepner AD, Piper ME, Johnson HM, Fiore MC, Baker TB, et al. Effects of smoking and smoking cessation on lipids and lipoproteins: Outcomes from a randomized clinical trial. *Am Heart J* 2011;161:145-151.
40. Liu J, Sempas C, Donahue RP, Dorn J, Trevisan M, et al. Joint distribution of non-HDL and LDL cholesterol and coronary heart disease risk prediction among individuals with and without diabetes. *Diabetes Care* 2005;28:1916-1921.
41. Bergmann K. Non-HDL Cholesterol and Evaluation of Cardiovascular Disease Risk. *The Electronic J Int Federation Clin Chemistry and Laboratory Med* 2012;23:2.

42. Boekholdt SM, Arsenault BJ, Mora S, Pedersen TR, LaRosa JC, et al. Association of LDL cholesterol, non-HDL cholesterol, and apolipoprotein B levels with risk of cardiovascular events among patients treated with statins: a metaanalysis. *JAMA* 2012;307:1302-1309.
43. Harats D, Ben-Naim M, Dabach Y, Hollander G, Stein O, et al. Cigarette smoking renders LDL susceptible to peroxidative modification and enhanced metabolism by macrophages. *Atherosclerosis* 1989;79:245-252.
44. Meisinger C, Baumert J, Khuseyinova N, Loewel H, Koenig W. Plasma oxidized low-density lipoprotein, a strong predictor for acute coronary heart disease events in apparently healthy, middle-aged men from the general population. *Circulation* 2005;112: 651-657.
45. Yamaguchi Y, Kagota S, Haginaka J, Kunitomo M. Evidence of modified LDL in the plasma of hypercholesterolemic WHHL rabbits injected with aqueous extracts of cigarette smoke. *Environmental Toxicol Pharmacol* 2000;8: 255-260.