Int J Biol Med Res. 2010; 1(3): 82-84.

Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Short report

Fast food (French fries) induced changes in lipid profile

Man Mohan Prakash[a,*], Santosh Gaherwal[a], Rajendra Chaurasia[a]

[a]*Post Graduate Department of Biotechnology, Govt. Holkar Science College, Indore-452017, India*

ARTICLE INFO

Keywords:
Fast food
Lipid Profile
Cholesterol
Triglyceride
LDL and VLDL

ABSTRACT

The present paper describes the impact of thirty day's feeding of fast food- French fries on the Lipid Profile of mice. The result obtained showed 12.30, 29.48, 25.77 and 34.66 per cent increase in cholesterol, triglyceride, low density lipoprotein(LDL) and very low density lipoprotein (VLDL) level respectively, While 31.47 per cent decrease in high density lipoprotein (HDL). This clearly indicates that the fast food- French fries may increase the risk factor of Obesity and Cardio Vascular Diseases.

1. Introduction

Fast food includes those food items, which can prepare and serve quickly. Nutritional analysis shows that generally fast foods are high in fat value specially saturated fat, energy density, fructose and glycemic index, but poor in fiber, vitamins A and C and calcium [1]. According to Bowman [2] children who eat fast food consume more total energy than those who do not.

Consumption of fast food increasing rapidly throughout the world. According to Zive [3] consumption of spreads in fast food all segments of society including local communities, public schools and hospitals. Most Fasts food is delicious but it is supposed to be dangerous to health and may cause clogget heart, hypertension, high blood pressure, diabetes, cholesterol, cancer, gall bladder disease, liver damage, vomiting, headaches, depression etc.

Looking to the important of fast food in causing the health problems, present work was undertaken to study the impact of French fries on the lipid profile of mice.

2. Materials and Methods

2.1. Experimental Animal

Mice MUS-MUSCULUS ALBINUS were received from the College of Veterinary Science and Animal Husbandry, Mhow (M.P.) and well acclimatized to the laboratory condition.

2.2. Test Food

French fries were used as test food, which was freshly purchased daily from Mc Donald's Treasure Island, 11, Tukoganj M.G. Road Indore (M.P.).

2.3. Experimental Design

Total 40 mice were used in the present investigation. They were divided in the following two groups-

(A) Control Group: In this group 20 mice were kept under normal diet and provided aquaguard water.
(B) Experimental Group: In this group 20 mice were kept on experimental diet i.e. (French fries) and provided aquaguard water.

Autopsy: Mice of experimental and control group were sacrificed after 0, 7, 15 and 30 days for blood collection by cardiac puncture-technique.

2.4. Biochemical Assay

Following biochemical technique were applied to find out the lipid profile.

(a) Estimation of Total Cholesterol by Ferric Chloride and Sulphuric Acid Method.
(b) Estimation of triglyceride was done by O.R.G. Triglyceride testing kit.
(c) Estimation of LDL/VLDL/ was done by DIRECT LDL/VLDL/ Testing kit.
(d) Estimation of HDL was done by Phosphor-tungstate magnesium chloride method.

3. Results

The results obtained in the present study are summarize in (Table 1-5 & figure 1-5)

* Corresponding Author : Dr. M M Prakash
Professer and Head, Post Graduat Deptt. of Biotechnology,
Govt. Holkar Science College, Indore (M.P.) India.
Email: mmpshrivastava@yahoo.co.in

3.1. Cholesterol

The cholesterol level of control and experimental group are described in table 1. The values of cholesterol in control group were in between 128 to 130 mg/dl, while the values of cholesterol in experimental group were found increased. The increase in cholesterol was gradual and duration dependent. Overall 12.30% increase was observed in mice after 30 day's regular feeding of French fries.

Table 1. Cholesterol level in mice fed with only French fries.

Experiment duration	Control value	Experiment value	Difference	% Alter
0 Day	128 mg/dl	132 mg/dl	4	+3.12
7 Day's	129 mg/dl	139 mg/dl	10	+7.75
15 Day's	127 mg/dl	140 mg/dl	13	+10.23
30 Day's	130 mg/ dl	146 mg/dl	16	+12.30

3.2. Triglyceride

Triglycerides level of control and experimental mice are summarized in table 2. The values of triglyceride in control group were in between 78 to 87 mg/dl, while in experimental groups was found increased from initial 79 to 101 mg/dl. The increase in triglyceride was gradual and duration dependent. Overall 29.48% increase was observed in mice after 30 day's regular feeding of French fries.

Table 2: Triglyceride level in mice fed with only French fries.

Experiment duration	Control value	Experiment value	Difference	% Alter
0 Day	82 mg/dl	79 mg/dl	3	+3.65
7 Day's	87 mg/dl	90 mg/dl	3	+3.44
15 Day's	80 mg/dl	98 mg/dl	18	+22.5
30 Day's	78 mg/dl	101 mg/dl	23	+29.48

3.3. LDL

The LDL values of control and experimental mice are summarized in table 3. The values of LDL in control group were observed in between 70 to 72.6 mg/dl, while in experimental group was found increased from 79 to 89.8 mg/dl. The increased in LDL was gradual and duration dependent. Overall 25.77% increase was observed in mice after 30 day's regular feeding of French fries.

Table 3. LDL level in mice fed with only French fries.

Experiment duration	Control value	Experiment value	Difference	% Alter
0 Day	72.6 mg/dl	79.0 mg/dl	6.4	+8.81
7 Day's	70.0 mg/dl	82.4 mg/dl	12.4	+17.71
15 Day's	71.2 mg/dl	85.0 mg/dl	13.8	+19.38
30 Day's	71.4 mg/dl	89.8 mg/dl	18.4	+25.77

3.4. HDL

The HDL values of control and experimental mice are summarized in table 4. The values of HDL in control group were estimated in between 32 to 35 mg/dl, while in experimental group it was found decreased. The decrease per centage gradually increases as the experiment duration progressed. Overall 31.47% decrease in HDL was observed in mice after 30 day's regular feeding of French fries.

Table 4. HDL level in mice fed with only French fries

Experiment duration	Control value	Experiment value	Difference	% Alter
0 Day	35 mg/dl	34 mg/dl	1	-2.85
7 Day's	35 mg/dl	32 mg/dl	3	-8.57
15 Day's	32 mg/dl	27 mg/dl	5	-15.62
30 Day's	34 mg/dl	23.3 mg/dl	10.7	-31.47

3.5. VLDL

VLDL value of control and experimental mice is summarized in table 5. The value of VLDL in control group was in between 14 to 16 mg/dl, while in experimental group it was found increase from initial 15.8 to 20.2 mg/dl. The increase in VLDL was gradual and duration dependent. Overall 34.66% increase was observed in mice after 30 day's regular feeding of French fries.

In observed lipid profile its component showed following trends.

Table 5. VLDL level in mice fed with only French fries.

Experiment duration	Control value	Experiment value	Difference	% Alter
0 Day	14 mg/dl	15.8 mg/dl	1.8	+12.85
7 Day's	15 mg/dl	18.6mg/dl	3.6	+24.0
15 Day's	16 mg/dl	19.6mg/dl	3.6	+22.5
30 Day's	15 mg/dl	20.2 mg/dl	5.2	+34.66

In the experimental mice order of lipid profile in decreasing trends are as follows;

VLDL (34.66%) < TRG (29.48%) < LDL (25.77%) < CHL (12.30%),

4. Discussion

The food we eat is an important factor in causing biological dysfunction in part, because our diets, some time lack the necessary balance of nutrients [4]. Disturbances in all dietary energy sources including carbohydrates, lipids and protein has increased risk of various diseases [5,6]. Lipids levels are associated with an increased risk of Cardio-vascular disease [7-9]. In the present investigation constant feeding of French fries (fast food) increased bad lipid profile in experimental mice.

Sitole [10] studied the plasma cholesterol level in noodles fed mice and reported 44.08 per cent increase in just 60 day's of feeding. Shrivastava [11] describeded 18.3 per cent increase in plasma cholesterol when mice were fed with pizza (fast food) for 45 day's. In the present investigation 30 day's feeding of French fries (fast food) increased the cholesterol level upto 12.30 per cent. Elevated cholesterol concentration is well known risk factor [12 ,13] for health.

Triglyceride is natural fats found with tissue and blood. These are main energy storing compound in body. Sitole [10] observed 60.97 per cent increase in triglyceride when mice were fed with noodles for 60 day's where as 42.3% increases was noted

in mice fed with pizza for 45 day's [11]. But in the present study 29.48 per cent increase was recorded in triglyceride of mice fed with French fries for 30 day's. Many studies showed that increase in triglyceride along with other lipids are found associated with an increased risk of cardiovascular disease [7- 9].

Low-density lipoprotein (LDL-C) are Known as bad cholesterol because its increase reflect an increase risk of heart disease, where as High- density lipoprotein (HDL-C) often called good cholesterol because its increase levels seems to protect against heart attack. In the present investigation 30 day's feeding of French fries decreased the HDL (31.47%) and VLDL (34.66%) and increased the LDL (25.77%). Similar results were also reported by [10, 11].

5. Conclusion

Thus on the basis of present study authors can conclude that the constant use of French fries in diet may increases the bad cholesterol and decrease good cholesterol level. Thus users of French fries are in risk factor of obesity and Cardio vascular Disease. Hence it is advisable to user that they should restrict or avoid regular use of such diet for better health condition.

Acknowledgement

The authors are thankful to Dr. S. L. Garg, Principal, Govt. Holkar Science College, Indore, for providing necessary laboratory facilities and encouragement.

6. References

[1] Guthrie JF, Lin B-H, Frazao E. Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences. J Nutr Educ Behav. 2002; 34: 140-150.

[2] Bowman SA, Gortmaker SL, Ebbeling CB, Pereira MA, Ludwig DS. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. Pediatrics. 2004; 113(1 Pt 1): 112-118.

[3] Zive MM, Elder JP, Prochaseka JJ. Source of diatery fat in middle school. Pre V Med. 2002; 35: 376-382.

[4] Chadwick R. Nutrigenomics, individualism and Public health. Proceeding of the Nutrition Society. 2004; 63 (1): 161-166.

[5] Brown WV. Lipoprotein disorders in diabetes mellitus. Med Clin North Am. 1994; 78:143-61.

[6] Stamler J, Vaccaro O, Neaton JD, Wentworth D. Diabetes, other risk factors, and 12-yr cardiovascular mortality for men screened in the Multiple Risk factor Intervention Trial. Diabetes Care. 1993; 15: 434- 444.

[7] Lee SH, Chun HK, Lee YS. The effects of rice germ oil supplement on blood glucose, serum lipid and blood pressure levels in diabetic patients. Korean J Nutr Med. 2001; 11 (4): 548-557.

[8] Noorouz- Zadeh J, Rahimi A, Tajaddini-Sarnadi J, Tritschler H, Rosen P, Halliwell B. Relationship between plasma measures of oxidative stress and glycemic control in NIDDM. Diabetologia. 1997; 40: 647-653.

[9] MacRury SM, Gordon D, Wilson R, Bradley H, Gemmell CG, Paterson JR.. Comparison of different methods of assessing free radical activity in type 2 diabetes and peripheral vascular disease. Diabet Med. 1993; 40: 331-351.

10] Sitole S. Impact of fast food (Noodles) on the lipid profile and blood sugar of mice M. Phil. Thesis, 2009; Govt. Holkar Science College, Indore (Affiliated to D.A.V.V., Indore).

[11] Shrivastava S, Gaherwal S, Prakash MM, Shukala A. Impact of fast food (Pizza) on the lipid profile of mice. Adv Pharmacol Toxicol. 2008; 9(3): 135-139.

[12] Wilson PWF. High-density lipoprotein, low- density lipoprotein, and coronary heart disease. Am J Cardiol. 1980;66: 7A- 10A.

[13] Grundy SM. Role of low-density lipoproteins in atherogenesis and development of coronary heart disease. Clim Chem. 1995; 41, 139-146.