ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 10, pp.7880-7883, October, 2019

DOI: https://doi.org/10.24941/ijcr.37039.10.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

MODELS USED TO INDUCED THREATS OF HYPERLIPIDEMIA

***Priya singh and Neda fatima**

Department of Pharmacy, Prasad Institute Technology, Jaunpur, Uttar pradesh, India

ARTICLE INFO

Article History:
Received 14th July, 2019
Received in revised form
18th August, 2019
Accepted 25th September, 2019
Published online 30th October, 2019

Key Words:
Introduction , atheogenetic diet, drug estogenen, anti- thyroid drug, allium sativum linn induced hyperlipedemia activity.

ABSTRACT

Due to various reasons like abnormal and unusual food habits, life styles and stress of various nature and origin, hyperlipidemia has become a common feature of the world in general and of developed countries in particular. This problem is affecting the human health and working potential of a large population and also threatening the life of many. Large quantum of work has been carried out worldwide to overcome this problem of the potent hypolipidemic agent screened; many plants are of Indian origin. Hyperlipidemia causes atherosclerosis which is a major cause of death in the world. In India atherosclerosis is also becoming a major disease with changing life styles and increasing stresses. Population studies and clinical trials have shown a strong relation between hyperlipidemia and coronary heart diseases. An increased risk of coronary heart disease is associated with a high serum concentrations of total cholesterol low density lipoprotein (LDL) cholesterol and triglycerides**.**On the other hand, low serum concentration of high density lipoprotein (HDL) cholesterol is also responsible for coronary heart diseases.

***Citation: Priya singh and Neda fatima*. 2019.** "Models used to induced threats of hyperlipidemia", *International Journal of Current Research*, 11, (10), 7880-7883.

INTRODUCTION

Lipoprotein are macromolecule it is mainly composed of lipid and protein Hyperlipidimia is a medical condition by an enhancing the level of plasma lipid, triglycerides, cholesterol, cholesterol ester phospholoipid and plasma lipoprotein including very low density lipoprotein and low density lipoprotein along with high density lipoproteins level. Hyperlipidemia increasing the risk of cardiovascular disease (Ghassan F. Shattat). Generally hyperlipidemia does not have any noticeable symptoms but they are usually discovered daily routine. The main aim of this paper describe methods are used to reduce the lipid but there is a various non-pharamacological therapy are also help to induce the level of lipid (Robert H. nelson,md). In the united states 53% of adults are affected from low denstity lipoprotein level. 50% of patients are affected from high density lipoprotein (Amit gupta,Vandana Sehgal, Sidhart Mehan). It also can be treated by changing the diet, weight loss and exercise. January 2012 to 2016 average up with 3.8 years. The incidence of hyperlipidemia group (195) patients and diabetes groups (200) patients. Fifty seven of 395 patients suffer from cardiovascular patients. There were 31 patients with myocardial infection and 18 patients with cerebral infaraction and 8 patients with cerebral hemorrhage (Samantha karr).

***Corresponding author:* Priya singh,**
Department of Pharmacy, Prasad Institute Technology, Jaunpur, Uttar pradesh, India.

The aim of the determination of the total cardiovasucular events in diabetes combined with hyperlipidemia group are all lower than the diabetes group. In this research paper we are studied various method to reduce hypercholesterlemics in animals (Dabei fan, Li Li Gujjan Qin).

Mainly two methods use in hypercholesterolemic animal models

- Atherogenic diet induced hyperlipidemic model
- Drug induced hyperlipidemic models
- Estrogen induced hypolipidemia model
- Antithroide drug induced hyperlipidemia model

Atherogenic diet induced hyperlipidemic model

•Many investigators used hypercholesterolemic rats by supplementing their diet with cholesterol 1%, fats and bile acids (e.g. cholic acid) 1% and thyroid antagonist propyl thiouracid, 0.01% in their drinking water (Dabei Fan). In general the higher the level of cholesterol and cholic acid in the diet, the higher the serum cholesterol. Cholesterol feeding regimens have ranged between 0.45 and 4.0% of the diet with cholic acid fed at level of 0.15% to 1.35% of the diet. On these regimens serum total cholesterol levels increase upto 14 fold.

Table 1. By using different animal, different doses with different models observation on inducing the level of Hyperlipidemia

Sr no.	Botanical name	Part used	Family	Doses	Animals	Model names	Active chemical constituent	Other reported activity	References
1	Salaciachinensis	Roots	Hippocrateaceae	500 mg/kg	Wistar albino rats	Atherogenic diet induced hyperlipidemia	Triterpene(lupanoi c acid)	Gonorrhoea, rheumatism	Ghule BV *et al*., 2006; Nomura H. *et al*., 1996; Inman W.D. *et al*., 1997; Naveen A., 2010.
2	*Terminaliachebula*	Fruits	Combretaceae	250mg/kg	Male adult albinowistar rats	Atherogenic diet induced hyperlipidemia	Pentacyclic Triterpenes	Antibacterial	Aiyer K.N. *et al*., 1963; padhi M.M., 2008; Reshma S. *et al*., 2002
3	*Curcuma longa Linn.*	Rhizomes	Zingiberaceae	100mg/kg	Wistar albino rats	Cholesterol diet induced hyperlipidemia	Curcumin	Anti- inflammatory, Anti-viral, Anti-fungal	Ramirez-Tortosa M.C. *et al*., 1999
4	*Bauhinia variegata Linn*.	Leaves	Caesalpiniaceae	65mg/kg	Adult albino rats	Triton WR-1339 induced hyperlipidemia	Flavanone, lupeol	Radical scavenging activity	Agarwal S.S. *et al*., 2009; Schurr P.E. *et al*., 1972; SaravanaK.A. *et al*., 2008
5	*Sesbaniagrandiflora*L.	Leaves	Fabaceae	200mg/kg	Wistar albino adult male rats	Triton WR-1335 induced hyperlipidemia	Sesbanimide, saponins	Anti -tuberculosis	Chopra R.N. *et al*., 1956; Saravana K.A. *et al*., 2008
6	*Aconitum heterophyllum Wall ex Royle*	Root	Ranunculaceae	200-400mg/kg	Sprague dawley strain rats	High-fat diet inducing	Diterpene alkaloids, flavonoids	Anti diabetic , anti fungal and anti inflammatory	Uniyal S.K. *et al*., 2002; Chopra R.N. *et al*., 1956; Jain S.K. *et al*., 1984; Pelletier S.W. *et al*., 1967; Anwar S. *et al*., 2003; Santosh V. *et al*., 2010; Gurudeeban S. *et al*., 2012
7	*TerminaliaarjunaRox b*.	Bark	Combretaceae	175 and 350mg/kg	Female swiss albino mice and male wistar rats	Poloxamer(px)-407 induced hyperlipidemia	Triterpenoides, flavonoids	Antioxidant, antibacterial	Jhonston T.P., 2004; Rane M.M. *et al*., 2003
8	*Thymus vulgaris*	Root	Lamiaceae	0.2g/100g	Adult female wistar rat	Triton WR-1339-induced hyperlipidemia	Polyphenol	Antiseptic, bronchial and spasmolytic agent.	EI-Hilaly J. *et al*., 2003; Gaomez M.J. *et al*., 1987
9	*Lavendulamultifida*	Aerial parts	Lamiaceae	0.2g/100g	Adult female wistar rat	Triton WR-1339-induced hyperlipidemia	Polyphenol	Depression, diabetes	Gilani A.H. *et al*., 2000; Sosaa S. *et al*., 2005; Ecobichon D.J. *et al*., 1997
10	*Erythrinaindica Lam*	Leaves	Fabaceae	200 mg/kg And 300mg/kg.	Wistar albino rats	Diet-induced obese	Alkaloids, Glycosides, Phenyl coumarin	Antihelmenthiasis,anti Inflammatory	Lausell S., 1966
11	Solanumnigrum	Fruits	Solanaceae	250mg/kg	Adult male albino wistar rats	Atherogenic diet induced hyperlipidemia	Polyphenol	Antiulcer,antineoceptive and antipyretic	Ong H.C., 2003; Latiff K.M., 2002; Dhellot J.R. *et al*., 2006
12	*Perseaamericana Mill*	Seeds	Lauraceae	125, 250, and 500 mg/kg	Adult male CD-1 mice	Cholesterol diet induced hyperlipidemia	Polyphenol	Antioxidant	Asaolu M.F. *et al*., 2010; Veerappan A. *et al*., 2007; Fogari R. *et al*., 2004
13	*Terminaliaarjuna*	Leaves	Combretaceae	500mg/kg	Male albino rats of Wistar strain	Cholesterol and cholic acid induced hyperlipidemia	Triterpenoides, flavonoids	Antioxidant, antibacterial	Reddy SundarBala D. *et al*., 2011

- Other dietary manipulation for increasing the lipid levels in rats: A three fold increase in triglyceride was observed with a diet of 60% sucrose rather than usual complex carbohydrate sources, when natural fats such a curd, butter or corn oil are fed to rats at 15% of the diet, serum cholesterol level increased the most butter and corn oil with polyunsaturated fat sources, serum cholesterol levels are less elevated approximately 300 mg/day (Ghule, 2006). The highest cholesterol levels in the rat are achieved when these diets are combined with an antithyroid drug such as propylthiouracil at 0.1% with the serum cholesterol level reported at 2000 mg/dl **(**Buchanan, 1969).

Drug induced hyperlipidaemia models (Triton induced hyperlipidaemia model). The systemic administration of the surfactant triton-WR-1339 (isooctyl polyoxyethylene phenol) to fasted or nonfasted mice and rat result in the elevation of plasma cholesterol and triglyceride level. The physicochemical properties of lipoproteins modified alloy triton involve an increase in the low density triglyceride rich fractions. The sustained hyperlipidaemia and hypercholesterolemia is induced by interference with the uptake of plasma lipids by the tissues. As a reaction to the impaired uptake of plasma cholesterol the rate of endogenous cholesterol biosynthesis is rapidly increased in the liver. The tests may therefore be divided into two phases. In the first phase, the drug to be lasted is given immediately after triton and the reduced level of blood lipid for period upto 8 hrs, are measured as criteria of activity. In the second phase, the drug is given 22 hrs after the triton injection and slope of the blood cholesterol curve is then observed. On the second part of the curve appear particularly active drugs interfering with cholesterol breakdown or excretion. In contrast with the first phase, in which the drug blocking endogenous synthesis are particularly active (Srinivasan, 1995).

Estrogen induced hyperlipidemia model: The administration of depot estrogen (estradiolcyclopentyl propionate) hens and cockerels induces a state of hyperlipidemia which eventually leads to the development of atherosclerotic lesions. Blood cholesterol level rise ten fold over control levels (90.8mg % v/s 133mg %) within 1 week following a single injection of depot β-estradiol in the chicken. This hyperlipidemia is endogenous and not dependent on the presence of dietary fat thus it seems obvious that cholesterol biosynthesis inhibitors could be detected using such a system (Chisaka, 1988).

Antithyroid drug induced hyperlipidemia model: It induced hypercholesterolemia in four months old dogs maintained on a diet containing cholesterol and thiouracil. At the end of one month marked hypercholesterolemia (100mg %) 5 times higher than the control value had developed. In the rat highest cholesterol level are achieved when diet is combined with an antithyroid drug such as propylthiouracil.

Pharmacognostical investigation and biological evaluation of Allium sativum linn

- The bulb of *Allium sativum* were collected and authenticated, and dried powder of it were subjected to extraction with ethanol and distilled water. Allium sativum have the hypolipidemic activity. In triton WR 1339 induced hyperlipidemia, gives extracts (2mg/kg body wt.), exerted lipid lowering effect.
- The standard drug fenofibrate (50 mg/kg body wt.) also administered in triton WR1339 induced hyperlipidemia model **(**Mahley, 1977**)**.

RESULTS

Lipid is a chemical substance that is insoluble in water but soluble in alchohol, ether and chloroform. In this research paper we are studied about how to reduce level of hyperlipidemia. Hyperlipidemia is a severe condition by which increase the level of lipid but many times high amount of lipid are toxic for human body. There are several methods such as anthrogenic diet reduce the level of hyperlipidemia , drugs, estrogens and anti-thyroid drugs all methods are help to reduce the hyperlipidemia level and these methods are applied on different animals at different dose and belong from different family. After some time result were obtained to decrease the level of lipid. It was also reported that this models have additional property such as antibacterial, anti-inflammatory, anti diabetics and antioxidant. Administration of ethanolic extract of *Allium sativum* linn. showed more significant results by decreasing in lipid parameters such as total cholesterol level, triglycerides, LDL and VLDL profile with increase in HDL-cholesterol, in the triton WR 1339 induced hyperlipidemia model respectively. The physicochemical analysis of *Allium sativum linn* was performed and determines the ash value and extractive value of the *Allium sativum linn.* The total ash value 10.12%. The acid insoluble ash was 2.1 % and the water soluble ash value was 8.22%. whereas the extractive value of *Allium sativum linn,* the alcohol soluble extractive value was 9.12% and the water soluble extractive value was 19.20% **(**Bevans, 1951).

Acknowledgement

I would like to special thanks to my respected professor. Who gave me a golden chance for completed this project. I also like to thanks all of that who are directly or indirectly involved for completion of project. I am also greatly thanks full to my parents who are given me great chance for explaining my views in this platform. I am also thanks full to all faculty who are encourage me all time for taking the new step and these all steps proceed me become success.

REFERENCES

Amit Gupta, Vandana Sehgal, Sidhart Mehan, Department of pharmacology, I.S.F College of Pharmacy, Moga – 142001, Panjab, International journal of biopharmaceutical and toxicological research.

Bevans M., Davidson J.D and Kendoll F.E., AMA; Arch. Pathol., 51; 1951;288.

Buchanan R.L., sprancmanis V, Patyaka R.A. 1969. J. Med.chem; 12 (6); 1001.

Chisaka T., Hastuda H., kubomur Y. 1988. Chem. Pharm. Bilk., (1); 1988; 227-233.

Dabei fan, Li Li, Gujjun Qin, effect of hyperlipidemia on the incidence of cardiocerebrovascular events in patients with type 2 diabetes, lipids in health and disease.

Ghassan F. shattat, Collage of science and health professions, king Saud Bin Abdulaziz university for heath science, Riyadh Saudi Arabia, review on hyperlipidimia, biomedical and pharmacology journal.

Ghule BV., Ghante MH., saoji AN., Yeole PG. 2006. Hypolipidemic and antihyperlipidemic effect of

Lagenariasiceraria (Mol). *Fruit extract, Indian journal of Experimental Biology.*, 44: 905-9.

Mahley R.W., Holocombe K.S. 1977. *Journal of Lipid Research,* 18; 314 – 324.

Robert H. nelson md, hyperlipidemia as a risk factor for cardiovascular disease.

Samantha karr , pharm D, FCCP, BCPS, BCACP, BC- ADM, epidemiology and management of hyperlipidemi.

Srinivasan M.R., srinivasan K. 1955. Indian journal of Experimental Biology, 33 (1); 64-66.

****