

Effect Of Homoeopathic Ultra Dilutions Of Allium Sativum 30CH, 200CH In Hyperlipidemia On High Fat Diet Induced Experimental Male Albino Wistar Rats

Dr. A.S. SHIVASARAVANAN¹, Dr. SUNNY MATHEW²

¹Professor & Head, Department of Surgery, Vinayaka Mission's Homoeopathic Medical College and Hospital, Salem, Tamilnadu, India
(A Constituent College of Vinayaka Mission's Research Foundation and Deemed to be University)

²Professor & Research Supervisor, Department of Materia Medica, Vinayaka Mission's Homoeopathic Medical College and Hospital, Salem, Tamilnadu, India (A Constituent College of Vinayaka Mission's Research Foundation and Deemed to be University)

Abstract

The present work is aimed at exploring dynamic homoeopathic potencies of Allium sativum 30CH and 200CH in hyperlipidemia on High Fat Diet induced experimental Male albino wistar rats. High Fat diet (HFD) has been fed to albino wistar rats to induce cholesterol. The period of experiment is 60 days, 24 rats will be divided into 4 groups. On 30th day onwards, group III and IV started receiving allium sativum 30CH and 200CH respectively except control group received normal rat chow diet and other groups received only high fat diet. On 60th day, the Allium sativum 30CH is slightly raised above the control group values of total cholesterol, High Density Lipoproteins (HDL) and Very Low Density Lipoproteins (VLDL) in reducing hyperlipidemia. Allium Sativum 200CH treated group which is having High HDL cholesterol when compared to control group which prevented atherosclerosis formation in the rat heart.

Key words: Homoeopathic pharmacology, allium sativum, hyperlipidemia, dyslipidemia, atherosclerosis, etc.

Introduction

Hyperlipidemia refers to increased levels of lipids (fats) in the blood, including cholesterol and triglycerides. Dyslipidemia has been closely linked to the pathophysiology of Cardio Vascular Diseases (CVD) and is a key independent modifiable risk factor for cardiovascular disease¹. In India, there has been an alarming increase in the prevalence of Cardio Vascular Disorders (CVD) over the past two decades that accounts for 24% of all deaths among adults aged 25–69 years². While Asian Indians are known to have a unique pattern of dyslipidemia with lower High Density Lipoprotein cholesterol (HDL), increased triglyceride levels and higher

proportion of small dense Low Density Lipoprotein (LDL) cholesterol. There have been no large scale representative studies on dyslipidemia to assess the magnitude of the problem in India³. Homeopathic medicines are highly individualized to the patient and this will help lower LDL cholesterol and triglycerides, raise HDL cholesterol, inhibit the formation of plaque, lower high blood pressure, detoxify the body and also enhance your immunity system.

Review of literature

Hypercholesterolemia is a pathophysiological condition of metabolism caused by incessant increase in blood cholesterol levels and might be a possible risk factor for many cardiovascular and its associated diseases. Due to adverse effects and cost efficiency of medications curing hypercholesterolemic disorders, medicinal plants are providing a cost effective alternative to reduce factors. This data of 22 important medicinal plant species possessing anti-hypercholesterolemia activity and their active phytoconstituents. Further, efforts should be made to implement these plant based drugs in clinical trials.⁴

Shiva saravanan reported that the action of *Allium sativum* 30X had same total cholesterol, HDL and VLDL-cholesterol level as that of control group and the lipid profile values under *glycyrrhiza glabra* 30X is slightly raised when compared to the control groups and their values lowered, when compared with HFD control group⁵. Hyperlipidemia belongs to the true natural chronic disease as specified by Hahnemann in §78 where even the best regulated mode of living with diet therapy and weight loss may not reduce the disease symptom which is presented as only a rise in serum lipid level unless complicated.⁶

Aim of the experiment

This study is carried out to evaluate the dynamic efficacy of homoeopathy. In previous researches, various forms of *Allium sativum* showed potent effect maintaining blood pressure, decrease triglycerides helps maintain healthy circulation helps prevent atherosclerosis (plaque build up in the arteries causing blockage and possibly leading to heart attack or stroke) improves circulation. This study is done mainly to evaluate the dynamic efficacy of homoeopathy.

Need for the study

In Homoeopathy, basic experimental study in hyperlipidemia is not done with various high ultra-dilutions. Hence, this study is intended to verify the 'specific' effect of *Allium sativum* 30CH and 200CH in cholesterol disorders.

Materials and methods used

Homoeopathic potencies have been procured from pharmaceuticals preparing medicines as per the Indian Homoeopathic Pharmacopoeia. The animal's wistar Male albino rats are procured from Venkateshwara enterprises, Bangalore; weighing more than 100-110gms are taken for the study. Institutional animal ethical committee approved the experimental protocol (P.COL/10/2017/IAEC/VMCP). The animals were maintained under standard condition in the animal house of Vinayaka Missions College of Pharmacy, Salem.

Preparation of high fat diet: DeOxycholic acid was mixed thoroughly with powdered rat chow diet. Simultaneously, coconut oil solution was added slowly into powdered mixture of normal diet to obtain homogenous soft cake. This High Fat Diet (HFD) preparation was molded in the shape of pellets of about 3g each⁷.

Experimental design

The period of experiment is 60 days, 24 rats will be divided into 4 groups. Each group will have 6 rats. Rats were acclimated for 7-10 days prior to experimental use. All the groups receive high fat diet except group I which will receive normal rat chow diet with normal saline. After induction of cholesterol (30th day onwards), group III, IV starts receiving 30CH and 200CH respectively 0.5ml once in morning before serving High Fat diet.

Group I control: The rats received distilled water in a volume of 0.5 ml during 60 days with normal rat diet.

Group II (HFD): The rats received High Fat diet (100g per day) during 60 days. Every day 15 min before food, they received distilled water in a volume of 0.5 ml per day.

Group III (AS30CH): The rats received High Fat diet (100g per day) during 60 days. Everyday 15 min before food, they received *Allium sativum* 30CH in a volume of 0.5 ml per day.

Group IV (AS200CH): The rats received High Fat diet (100g per day) during 60 days. Every day 15 min before food, they received *Allium sativum* 200CH in a volume of 0.5 ml perday.

Biochemical investigations – lipid profile (total cholesterol, HDL, LDL, VLDL & Triglycerides), liver enzymes will be estimated on First day, 30th day and 60th day of the study period.

The substances were administered by gavages; during the experimentation, animal's body weight will be measured from first day to 60th day. Blood will be collected from rats with capillary tube from Retino-orbital plexus of the animals in dry tube. The blood samples will be centrifuged at 3000 RPM for 15 min and the serum obtained. At the end of study period, Liver will be subjected to histopathological study and heart for atherosclerotic changes.

Framework of analysis

The ultimate object of the experiment was to test the level of the hyperlipidemia among various experimental rats. Analysis of one way variance (ANOVA) is applied to measure the relationship among the various groups with regard to total cholesterol, triglycerides, HDL-cholesterol, LDL - cholesterol, and VLDL-cholesterol. After 60 days of study, the body weight of the HFD control animals increased significantly when compared to normal diet group ($P < 0.01$). Treatment with *Allium sativum* 30CH and 200CH appreciably decreased the gain in the body weight ($P < 0.01$). Tukey's multiple comparison tests are employed to know which group differs significantly from others with regarding lipid profile.

Results and discussions

The results of the experiment are given under:

TABLE 1 First Day of Experiment- Lipid Profile

Treatment	Total Cholesterol (mg/dl)	Triglycerides (mg/dl)	HDL- Cholesterol (mg/dl)	LDL Cholesterol (mg/dl)	VLDL- Cholesterol (mg/dl)
CONTROL	87.36±5.53	88.05±6.31	23.38±1.70	44.67±3.84	18.27±1.25

HFD CONTROL	85.32±6.67	89.59±11.14	22.51±2.11	44.34±3.49	18.18±2.15
AS30CH	86.35±4.45	84.08±3.98	24.58±0.97	43.61±3.92	17.48±1.18
AS200CH	85.45±4.18	84.10±5.90	23.87±2.61	46.48±3.90	18.40±1.71

TABLE 2 First Day of Experiment- Liver Enzymes

Treatment	SGOT (IU/L)	SGPT (IU/L)	ALP (IU/L)
CONTROL	100.83±9.77	33.00±3.95	104.67±8.21
HFD CONTROL	99.00±10.63	34.00±3.87	107.00±10.11
AS30CH	91.50±5.47	40.34±2.03	107.00±7.00
AS200CH	94.67±15.34	33.67±3.32	109.8±8.85

The calculated F values for total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol, SGOT and ALP are 0.250, 0.656, 1.279, 0.453, 1.467, 1.437 and 0.992 respectively. These values are less than the table value (2.372) at 5% level of significance. The test is not significant. This means that no significant relationship is found among the groups with regard to total cholesterol, triglycerides, HDL-cholesterol, LDL - cholesterol, VLDL-cholesterol, SGOT and ALP on the first day of the experiment. On the other hand, the calculated value of SGPT is (5.94) is greater than the table value (2.372) at 1% significance level. Therefore, a significant relationship is found among the groups with regard to SGPT on the first day of the experiment.

TABLE 3 30th Day of the Experiment- Lipid Profile

Treatment	Total Cholesterol (mg/dl)	Triglycerides (mg/dl)	HDL- Cholesterol (mg/dl)	LDL Cholesterol (mg/dl)	VLDL- Cholesterol (mg/dl)
CONTROL	88.50±7.11	91.50±6.78	32.3±2.68	49.33±4.53	18.00±1.29
HFD	187.00±20.4	187.00±21.2	22.83±2.0	152.67±37.7	28.33±3.4

CONTROL	4	8	0	4	0
AS30CH	201.17±16.7	158.33±14.5	18.83±3.4	140.33±18.5	29.33±3.4
	0	0	9	0	0
AS200CH	179.67±9.46	145.33±9.34	21.40±1.71	138.00±11.12	25.67±5.25

TABLE 4 30th Day of the Experiment- Liver Enzymes

Treatment	SGOT(IU/L)	SGPT(IU/L)	ALP(IU/L)
CONTROL	112.33 ± 9.33	31.33 ± 2.49	107.00±5.74
HFD CONTROL	280.33± 34.17	238.50 ±43.80	378.33±77.96
AS30CH	279.33±53.10	211.33±56.77	312.00±86.66
AS200CH	274.83±29.84	214.50±60.97	240.50±50.54

The calculated F values for total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol,VLDLcholesterol,SGOT,SGPTandALPare45.060,31.380,15.210,15.410,7.450,18.440,19.260 and 14.830 respectively. These values are greater than the table value (2.372) at 5%level of significance. Therefore, a significant relationship is found among the groups with regard to total cholesterol, triglycerides, HDL-cholesterol,LDL-cholesterol,VLDL-cholesterol,SGOT and SGPT on the 30th day of the experiment.

TABLE 5 60th Day of the Experiment- Lipid Profile

Treatment	Total Cholesterol (mg/dl)	Triglycerides (mg/dl)	HDL-Cholesterol (mg/dl)	LDL Cholesterol (mg/dl)	VLDL-Cholesterol (mg/dl)
CONTROL	91.33±2.00	113.33±2.16	32.33 ±2.68	62.00 ±6.50	18.17±1.47
HFD CONTROL	308.00±18.83	255.67±40.52	27.00±1.41	196.50±5.28	39.83±3.84
AS30CH	125.83 ±2.60	140.33±1.33	34.50 ±1.50	96.33 ±5.08	28.00 ±3.05
AS200CH	128.00 ±2.58	142.33 ±3.90	37.83 ±5.18	82.00±2.58	20.83 ±1.92

The F values for total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol, SGOT, SGPT and ALP are 549.52, 43.56, 4.36, 364.36, 74.47, 89.52, 634.00 and 346.63 respectively. These values are greater than the table value (2.372) at 5% level of significance. The test is insignificant. This means that a significant relationship is found among the groups with regard to total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol, SGOT, SGPT and ALP on the 60th day of the experiment.

TABLE 6 60th Day of the Experiment- Liver Enzymes

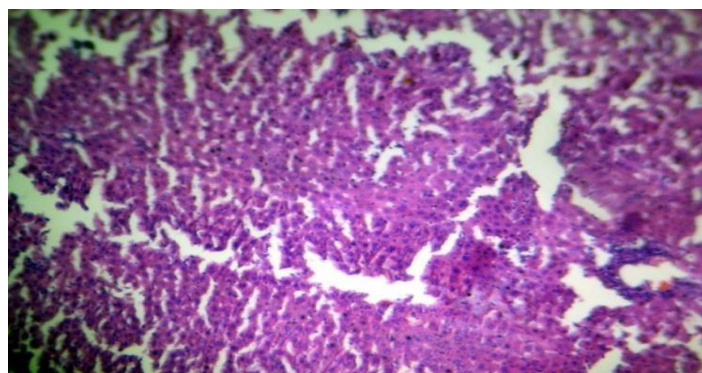
Treatment	SGOT(IU/L)	SGPT(IU/L)	ALP(IU/L)
CONTROL	137.17±5.89	37.83±3.18	157.16±6.22
HFD CONTROL	290.83±28.18	195.00±11.64	412.67±20.06
AS30CH	159.67±6.67	67.67±3.19	218.50±6.80
AS200CH	151.33 ±6.39	49.50±1.38	220.17±6.59

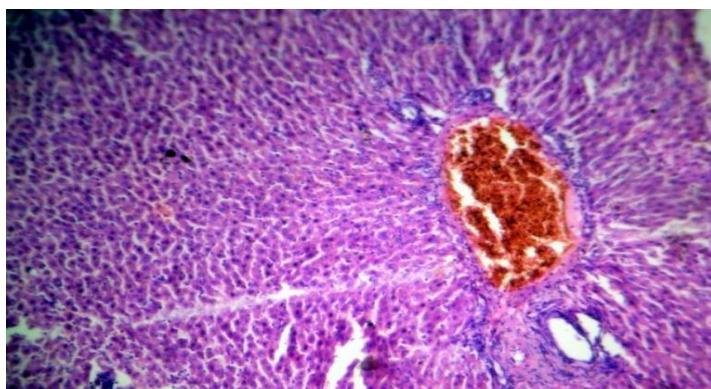
TABLE 7 Average Bodyweight of the Experimental Rats on Different Drugs

Groups	DAY 0	DAY 30	DAY 60
Control	110.50±4.78	146.69±3.82	202.56±05.22
HFD	118.67±23.57	187.50±34.37	277.50±08.95
AS30CH	110.83±10.57	210.00±12.58	192.50±11.81
AS200CH	109.83±01.86	185.00±11.90	193.30±12.13

HISTOPATHOLOGICAL STUDY

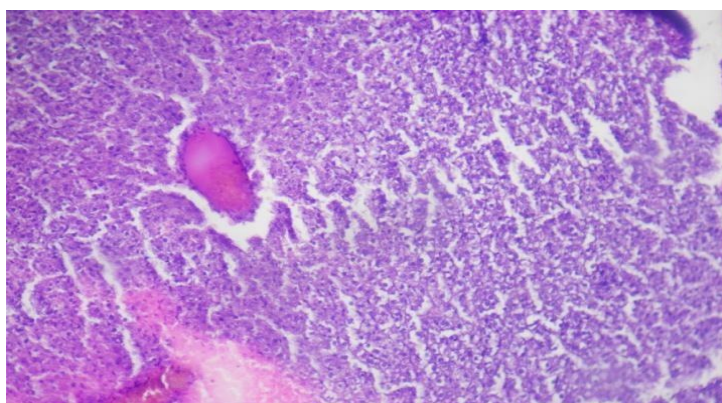
RAT LIVER -CONTROL



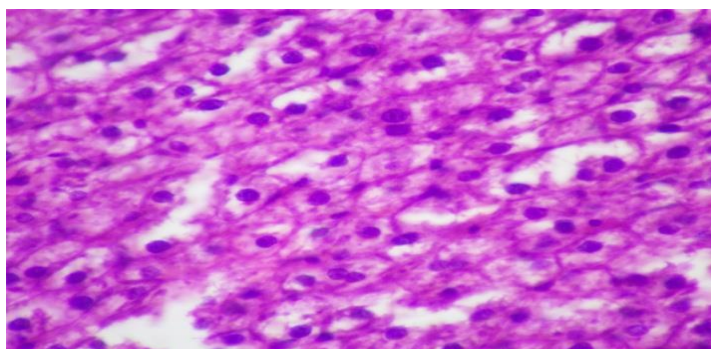


HFD CONTROL

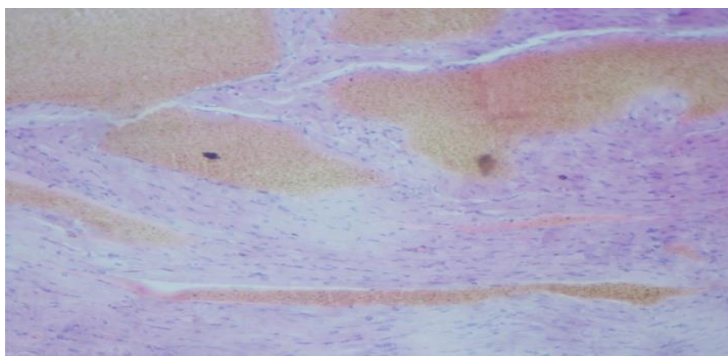
AS 30CH



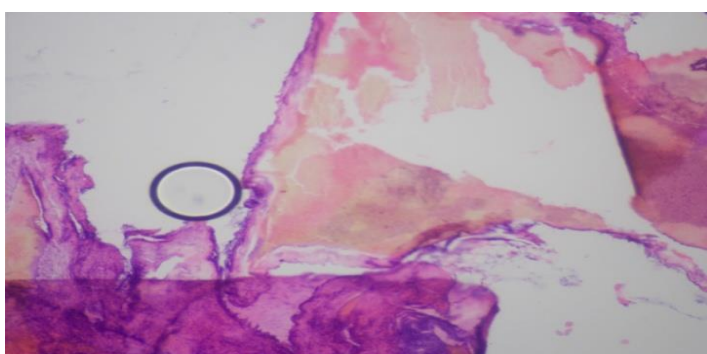
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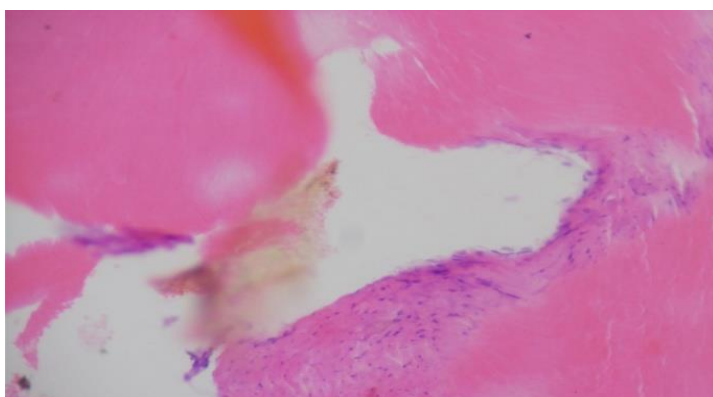
**HISTOPATHOLOGY OF RAT
HEART CONTROL**



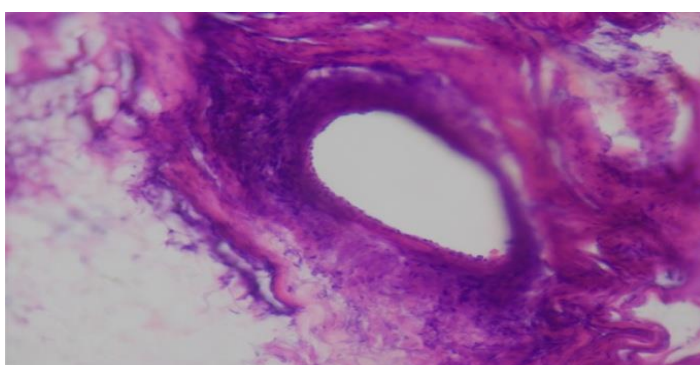
HFD



AS30CH



AS200CH



Conclusion

The study investigated the hypolipidemic effect of Ultra dilution of allium sativum 30CH and 200CH in experimental rats. Significant changes have been found in the total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol, liver enzymes of SGOT, SGPT and ALP in the rats after the administration of the drug. No adverse effects were found in the study period in the rats. All the three groups are given high fat diet with respective experimental drug except control group is treated with distilled water and normal rat diet. Based on the biochemical investigation and changes in the liver and atherosclerosis of heart (Histopathology) results were arrived. The study has clearly explained the effect of Allium sativum 30CH and 200CH in reducing hyperlipidemia with more scientific validation. Histopathological study of liver treated with Allium sativum 30CH is having almost normal architecture similar to that of the control group. Histopathological study of Rat Heart treated with Allium sativum 200CH is having almost normal architecture similar to that of the control group. Therefore, Allium sativum 30CH and 200CH had slightly raised biochemical values when compared with the control group but it was found to be effective in reducing hyperlipidemia.

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