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HYPOLIPIDEMIC POTENTIAL OF POLY HERBO-MINERAL SIDDHA MEDICINE SANJEEVI THEENEER

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ABSTRACT: Hyperlipidemia is a significant contributor to the formation and worsening of atherosclerotic plaques, which can lead to serious health issues, including heart disease, stroke and peripheral vascular disease. Standard treatments indicated for Dyslipidemia and Hyperlipidemia with statins and with the other available agents have notable adverse effects. Therefore, Alternative approach for newer pharmacological agents which are more effecient in mainting VLDL, LDL, HDL, Triglycerides is essential in the current era. The present study was conducted to assess the efficacy of hypolipidemic potential of Sanjeevi theneer in hyperlipidemic induced rats. The trial drug showed significant hypolipidemic effect by lowering the levels of serum cholesterol, VLDL, LDL, Triglycerides, and increases HDL levels which was similar to standard drug Simvastatin. So it is concluded that *Sanjeevi theeneer* can be used for the treatment of Hyperlipidemia in Cardiac risk peoples.
Keywords: Hyperlipidemia, Statins, *Sanjeevi theeneer*, Cardiac diseases, Thiriphala.

INTRODUCTION

Approximately 17.9 million people worldwide die annually from cardiovascular disease and hyperlipidemia is the highest attributable risk [1]. It is regarded as one of the worlds five dominant causes of death[2]. Hyperlipidemia is a significant contributor to the formation and worsening of atherosclerotic plaques, which can lead to serious health issues, including heart disease, stroke and peripheral vascular disease [3]. It is defined as lipid metabolic disorder characterised by an increase in one or more of the plasma lipids, including triglycerides, cholesterol esters, phospholipids and plasma lipoproteins including Very Low Density Lipoprotein (VLDL) and Low Density Lipoprotein (LDL), along with diminished HDL (High Density Protein) levels[4]. Its prevalence is influenced by the genetic and lifestyle such as high calorie diet and a high intake of cholesterol and saturated fats.[3]

The World Health Organisation, a global health observatory reports that high cholesterol levels is responsible for approximately one third of Ischemic Heart Disease cases, resulting in 2.6 million deaths and 29.7 million to disability[5]. Although there are wide range of available allopathic hypolipidemics like statins and fibrate, they are not much appreciated due to their significant side effects such as rhabdomyosis, hyperuricemia, hepatotoxicity[6]. The wide spread prevalence of lipid disorders combined with the limitations and potential risk of conventional treatments, is driving many individuals to seek alternative solutions that offer greater safety and efficacy.

Irudhaya noi, an emcompassing term for cardiovascular disease in Siddha, has witnessed a surge in prevalence[7]. Exact term for hyperlipidemia is not found in Siddha literature, and this might be because of the fact that it is a metabolic disorder but not a complete disease by itself. Herbal treatments have been essential in human healthcare throughout history, as various traditional medical systems have used them to treat a wide range of health issues including metabolic disorder as a synergistic agent. Polyherbal formulation are comprised of plenty of chemical compounds including volatile substances which are the most important source of therapeutic representatives to treat human disease. Sanjeevi theeneer is a synergetic herbo-mineral formulation from the book Cikitcha Ratna Deepam ennum vaidhya nool indicated for Maarbu Noi (Irudhya Noi - Cardiac ailments)[8]. In the present study, a Triton WR 1339 induced hyperlipidemic model was used to evaluate the effect of *Sanjeevi theeneer* as an anti hyperlipidemic agent[9].

AIM AND OBJECTIVE: The main objective of the present study was to determine the hypolipidemic potential of *Sanjeevi theeneer* on albino rats.

MATERIALS AND METHODS:

Pharmaceutical Study: Raw drugs required for the preparation of *Sanjeevi theeneer* (Distillate medicine) were collected from authenticated raw drug retail store RN Rajan and CO, Parrys, Chennai. Preparation of *Sanjeevi theeneer* (Distillate Siddha Medicine) was carried out at Government Siddha Medical College, Arumbakkam, Chennai using Distillation apparatus as per the reference of Cikitcha rathna Deepam ennum vaithya nool.

Experimental Study: TRITON WR 1339 INDUCED HYPERLIPIDEMIA FOR SANJEEVI THENEER (ST)

Acute oral toxicity study was performed using Wistar albino rats as per OECD (Organization for Economic Co-operation and Development) guidelines[10]. Sanjeevi theeneer was found to be safe upto 5 ml/kg body weight when administered orally. Two doses of Sanjeevi theeneer were selected: 2.5ml and 5 ml/kg. Wistar strains, Albino rats of either sex between 200 to 250 g were obtained from animal house attached to Mass Biotech, Chennai. The experimental protocol was approved by the institutional ethical committee under the reference no-**944/PO/13/RE/S/06/CCSEA**. The animals were fed with a pellet supplied by Sai Meera Foods Pvt Ltd, Bangalore. They were acclimatized in the laboratory condition for one week prior to the experimentation. The housing provided has the following conditions: controlled lighting of 12:12h light and dark cycle, the temperature of 22ºC, and relative humidity of approximately between 30% and 70%. Hyperlipidemia was induced by injecting 10% Triton WR 1 339 (isooctyl-polyoxyethylene phenol) intravenously after 18 hours of starving. Rats were divided into five groups containing six animals each ; Group I administered with 2% CMC (Normal Control), Group II administered with 10% Triton WR – 1339 (Hyperlipidemic Control), Group III administered with Standard Simvastatin (10 mg/kg b.wt), Group IV received Test drug *Sanjeevi theeneer*- 200mg/kg b.wt, Group V received Test drug *Sanjeevi theeneer*- 400mg/kg b.wt. All the animals after 72 hours of triton injection (ie. after inducing hyperlipidemia) the respective treatment was continued for 7 days.

Collection of Blood Sample and Biochemical Analysis from Serum:

On the 8th day fasting blood samples was collected by retro orbital sinus puncture under mild ether anaesthesia in a coagulant free vessel, and were kept at room temperature for 1 hour. The collected samples were centrifuged at 4000-5000 rpm to seperate serum for 10 minutes which was subjected for the estimation of lipid profile. Then serum samples were collected and it is used for various biochemical experiments to assess total cholesterol, high-density lipoprotein, low-density lipoprotein, and triglycerides. Immediately after sacrificing the animals, liver were separated, washed with pH 7.4 buffer, bloated with dry filter paper and liver weigh was recorded.

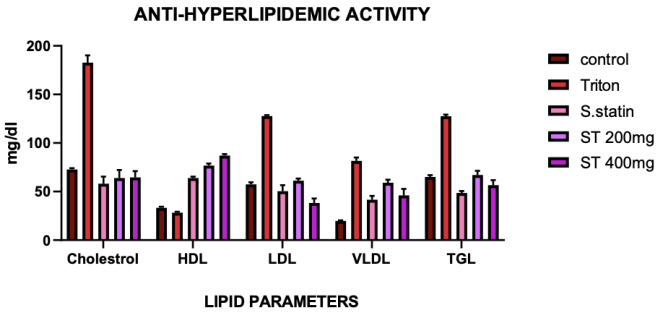
STATISTICAL ANALYSIS: All data are presented as mean ± SEM. To investigate the relationship among the groups, one-way ANOVA followed by Dunnett's test. P - values <0.05 were considered significant.[11]

OBSERVATION AND RESULTS

Lipid parameters	Group-I Normal control	Group-II Triton control rats	Group-III Hyperlipidemic + Simvastatin	Group-IV Hyperlipidemic + ST 200 mg	Group-V Hyperlipiemic + ST 400 mg
Cholesterol (mg/dl)	72.80±1.20	182.81±7.43***	58.13±7.3**	63.90±8.4**	64±6.4**
HDL (mg/dl)	33.23±1.25	28.30±0.97**	63.90±1.59**	76.70±2.19**	87.13±1.42**
LDL (mg/dl)	57.43±2.2	127.80±0.90**	50.40±6.10**	61.21±2.21**	38.31±4.6**
VLDL (mg/dl)	19.74±0.60	81.50±3.55***	41.50±4.082**	59.15±3.17**	46.12±6.61**
TGL (mg/dl)	65.02± 1.88	127.50±1.70***	48.50±2.04**	67.15±4.30**	56.54±5.20**

TABLE1: SUMMARY OF EFFECT OF *SANJEEVI THEENEER* ON LIPID PROFILE

*Values were expressed as Mean±SEM, n=6, Hyperlipidemic control was compared with normal control rats - Values are statistically significant at +P<0.05, ++P<0.01, +++P<0.001 Experimental groups(III & IV) were compared with hyperlipidemic control rats - Values are statistically significant at *P<0.05, **P<0.01, ***P<0.001*



DISCUSSION: The main objective of the present study was to determine the hypolipidemic potential of *Sanjeevi theeneer* on albino rats.
Effect on Lipid Profile: High levels of total cholesterol are associated with increased risk of atherosclerosis[3]. Elevated levels of triglycerides and LDL are associated with coronary artery disease, which is seen in untreated group II which include 10% Triton WR 1 339 (isooctyl-polyoxyethylene phenol) induced rats. Test drug induced rats in group IV and group V significantly reduced total cholesterol and triglycerides and increases HDL levels when compared with experimental control animals. Further it was noted that Sanjeevi theeneer at the dose 400 mg/dl shows significant results compared to the dose 200 mg/dl.
This analytical study provide evidence base to '*Maarbu Noi*' mentioned in *Cikitcha Ratna Deepam* for *Sanjeevi theneer*. *Chukku (Zingiber offinale), Milagu (Piper nigrum), Thippili (Piper longum), Kadukkai thol (Terminalia chebula), nelli vatral (Phyllanthus emblica), Thantrikkai thol (Terminalia bellerica), Omam (Trachyspermum ammi), Vaividangam (Emblica ribes), Chithramoola verpattai (Plumbago zeylanica), Korai Kizhangu (Cyperus rotundus), Panam karkandu (Borassus flabellifer), Irumbu podi* (Purified Ferrum powder) are used as ingredients of Sanjeevi theneer[8]. Recent studies show that these have hypolipidemic and cardio protective properties of certain drugs such as *Chukku (Zingiber offinale), Milagu (Piper nigrum), Thippili (Piper longum), Kadukkai thol (Terminalia chebula), nelli vatral (Phyllanthus emblica), Thantrikkai thol (Terminalia bellerica), Omam (Trachyspermum ammi), Vaividangam (Emblica ribes), Chithramoola verpattai (Plumbago zeylanica), Korai Kizhangu (Cyperus rotundus)[12][13][14][15][16][17][18][19][20][21]* . These properties of drugs have attributed the hypolipidemic activity of Sanjeevi theeneer.

CONCLUSION: The results of the experimental study show that *Sanjeevi theeneer* (Distillate medicine) contributes specific properties in reducing total cholesterol, LDL, Triglycerides, and to increase HDL significantly. This effect is more associated in reducing harmful effects of fats which are considered to be a significant role in atherosclerosis and other cardiac ailments. Hypolipidemic activity in *Sanjeevi theneer* is attributed by the drugs used in fermentation process (pre distillatation process) having certain properities like *kaarppu* (pungent), *thuvarppu* (astringent) *suvaigal* (taste) predominantly, which certainly indicates the Fat lowering quality of those tastes as per Siddha text book. These attribute the hypolipidemic activity to *Sanjeevi theeneer* prepared with certain raw drugs possessing important phytochemicals, volatile oils and metabolomics. Recent studies also show that *Triphala, Korai kizhangu (Cyperus rotandus), Thirikadugu and Chithra moola verpattai (Plumbago zeylanica)* which are used for *Sanjeevi theeneer* (Distillate Siddha Medicine) have hypolipidemic and cardio protective activity. *Sanjeevi theeneer* prepared by fermentation and distillatation is therapeutically efficacious and convenient as the form of medicine is simple and effective. Hence, the indication "Maarbu Noi" mentioned in classical text for *Sanjeevi theeneer* statement stands scientific and beneficial under hyperlipidemic condition as a major risk factor[8].

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