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RELIEVING IMPACTS OF ANTIOXIDANT PROPERTIES OF GINSENG ON STANNOUS CHLORIDE ACTUATED LIPID PROFILE IN MALE RABBITS

Fayrouz A. Khaled*[1], Nesreen A. Abd- Alhady[1], Sara M Elgazwi[1]

[1*]Department of Chemistry, Faculty of Science, Omar Al-Mukhtar University, Al -Bayda-Libya.

ABSTRACT

Stannous chloride ($SnCl_2$), an inorganic salt. The known toxicity potential of stannous chloride has given rise to increasing concern about the human. Ginseng is a plant of medical importance and it has been used by elderly Asian to boost physical and mental vitality. Rabbits were orally given sub lethal dose of stannous chloride (20mg/kg BW), while ginseng (100mg/kg BW) was given alone or in combination with stannous chlorid. The tested doses were given to rabbits every day for 12 weeks. Results showed that $SnCl_2$ caused a significant (PB/0.05) increase in the levels of plasma cholesterol, triglyceride (TG), low density lipoprotein (LDL) and very low density lipoprotein (VLDL), while the level of high density lipoprotein (HDL) decreased. Ginseng alone significantly (PB/0.05) decreased the levels of cholesterol, TG, LDL and VLDL and increased HDL and alleviated the harmful effects of $SnCl_2$ on lipid profiles.

KEYWORDS

Stannous chloride, Ginseng, Lipid profile and Rabbits.

Author for Correspondence:

Fayrouz A. Khaled,

Department of Chemistry,

Faculty of Science, Omar Al-Mukhtar University,

Al -Bayda-Libya.

Email: idress.hamad@omu.edu.ly

INTRODUCTON

Stannous chloride (hydrous and anhydrous) is additionally known by the equivalent words: tin(II) chloride, tin dichloride, tin(II) chloride (1:2), dichlorotin, tin precious stones, tin salt, tin protochloride, stannosi chloridum dihydricum[1]. Tin (II) chloride, could be a white crystalline strong with the equation $SnCl_2$. It shapes a steady dihydrate, but watery arrangements tend to experience hydrolysis, especially in the event that hot. $SnCl_2$ is broadly utilized as a decreasing operator (in corrosive arrangement) and in electrolytic showers for tin-plating. $SnCl_2$ ought to not be confounded with the other chloride of tin; tin (IV) chloride or stannic chloride ($SnCl_4$) in the last

25 years, considerable efforts have been made to understand the effect of tin, tin compounds and Sn^{2+} on human cells[2] and in the environment[3]. The food industry uses stannous chloride as a preservative (e.g., in soft drinks) and in some fluoride tooth pastes. Possible joint consumption of these compounds, therefore, makes relevant information on their effect, isolated or in interaction, even with other organisms used as indicators[4].

Stannous chloride ($SnCl_2$) could be a decreasing chemical specialist utilized in a few man-made items (moderate soft drinks and a few fluoride toothpastes). $SnCl_2$ may be a strong inductor of heme oxygenase-1 (HO^{-1}) in intense uncover in rodent and rabbit[5]. $SnCl_2$ is competent to advance the era of receptive oxygen species (ROS) that are mindful for the oxidative push. Oxidative damage to biomolecules, such as lipids, DNA and proteins, has been related with many chronic diseases, in particular, cardiovascular disease, cancer, cataract, aging and other neurological diseases[6]. A high-fat diet (HFD) has been reported to adversely affect the health of humans and animal species[7] and led to development of dyslipidemia and obesity which characterized by insulin resistance and adipose tissue inflammation[8]. Dyslipidemia alludes to a disturbance of lipid digestion system with surpassing serum levels of cholesterol (TC), triglyceride (TG), low-density lipoprotein-cholesterol (LDL-C), and/or lower level of high-density lipoprotein-cholesterol (HDLC)[9]. The relationship between hypercholesterolemia with the predominance of cardiovascular maladies has been well archived. Increased in plasma low density lipoprotein concentration has been associated with the susceptibility of developing atherosclerosis[7]. Cardiovascular illnesses, which have been on the rise as an imperative well-being issue in advanced society, are one of the most causes of passing and are known to be initiated basically by atherosclerosis and activated by common chance variables such as hypertension, hyperglycemia, smoking and push.

These risk factors are said to extend oxidative push, which at that point causes different infections such as cancer, heart infection, atherosclerosis, stomach related infection and immune system illness and maturing. In addition, receptive oxygen species (ROS) delivered through common metabolic pathways within the body, are known to induce oxidative harms to proteins, fats, and DNA, consequently the have to be disposal of ROS[10]. Ginseng frequently depicted as the ruler herb, since it holds an imperative position in conventional oriental pharmaceutical in numerous nations. Ginsenosides from Panax ginseng have been appeared to have a assortment of advantageous impacts counting anti-inflammatory, antioxidant, anticancer, progress mental work, resistant work and advances the work of the endocrine glands and the reproductive organs in the body and condition associated with diabetes[11]. Ginseng exerts a protection directed towards the most damaged muscles. This protection affects the mitochondrial function and dimmishes protein oxidation. The organization of a few grams of ginseng every day increments the capacity of the body to preserve its antioxidant status. Furthermore, lipid levels such as LDL-cholesterol are lowered[12,13]. Studied the effect of Panax ginseng on lipid metabolism and oxidative stress in human by measuring total serum cholesterol, triglyceride (TG), low density lipoprotein (LDL), high density lipoprotein (HDL). They found that the administration of ginseng decreased TG, LDL and increased HDL level.

MATERIAL AND METHODS

Tested compounds

In this study stannous chloride ($Sncl_2$) and ginseng were used. $Sncl_2$ (purity 400g/L) was brought from chemistry department, faculty of science. Ginseng was purchased from public market for medicinal herbs in Al-Bayda city.

Animals and management

Mature male New Zealand White rabbits age of 6 months and initial weight of (1.891 ± 27.6Kg) were used. Creatures were independently housed in cages and weighed week by week all through 3-months test period. Feed and water were provided ad libtum. Rabbits fed pellets which consisted of 30% berseem (Trifolium alexandrinum) hay, 25% yellow corn, 26.2% wheat bran, 14% soybean meal,

3% molasses, 1% $CaCl_2$, 0.4% NaCl, 0.3% mixture of minerals and vitamins and 0.1% methionine. The vitamin and mineral premix per kg contained the following IU/gm for vitamins or minerals: vit A-4000,000, vit D3-5000, 000, vit E-16,7g, K-0.67g, vit B1-0.67g, vit B2-2g, B6-0.67g, B12-0.004g, B5-16.7 g, Pantothinc acid-6.67g, Biotein-0.07g, Folic acid-1.67g, Choline chloride-400g, Zn-23.3 g, Mn-10g, Fe-25g, Cu-1.67g, I-0.25g, Se-0.033g and Mg-133.4g (Rabbit premix produced by Holland Feed Inter. Co.). The chemical analysis of the pellets[14] showed that they contained 15.8% crude protein, 11.3% crude fiber, 3.7% ether extract, 7.2% ash, 92.9% organic matter and 62.4% nitrogen free extract % as DM basis.

The first group was used as control. While, groups 2, 3 and 4 were treated with ginseng100 mg/kg BW[15] and $SnCl_2$ by gavage at a dose of 43.2mg/kg B.W/day (1/50 of $SnCl_2$) lethal dose[16] and the combination of stannous chloride and ginseng, respectively. Rabbits were given with $Sncl_2$ daily at a dose of 43.2mg/kg B.W./day by gavage like group III and given the ginseng concurrently daily at a dose of 100mg/kg B.W./day by gavage like bunch II for 12 progressive weeks.

Blood Sampling

The other part of heparted blood samples were placed immediately on ice. Plasma was obtained by centrifugation of samples at 860 xg for 20 min and was stored at -20°C until used for analyses. Stored plasma samples were analyzed for Plasma concentrations of cholesterol and triglycerides (TG) were determined according to the methods of[17-19] and respectively. High-density lipoprotein (HDL) was determined according to the methods of[20]. Low-density lipoprotein (LDL) was determined by the calculation (cholesterol-(TG/5+HDL). Very low-density lipoprotein (VLDL) was calculated by dividing the values of TG by factor of 5.

Statistical analysis

Where applicable, statistical analysis was carried out in Minitab software (version17) statistical significance was assessed using ANOVA analysis with Tukey multiple comparison test after detection normal distribution to the data and appropriate $P < 0.05$ consider significant.

RESULTS

Tables No.1 and Figures No.1 and Figure No.2 illustrated the effect of ginseng, stannous chloride ($SnCl_2$) and/or their combination on the levels of total cholesterol (TC), triglyceride (TG), very low-density lipoprotein (VLDL-c), high and low-density lipoprotein-cholesterol (HDL-c and LDL-c) in blood plasma of male rabbits. The levels of, TC, TG and LDL-c were significantly ($P<0.05$) increased, while HDL-c, were significantly ($P<0.05$) decreased in plasma of rabbits treated with $SnCl_2$ alone as compared with control group. The levels of TC, TG, LDL-c and VLDL were significantly ($P<0.05$) decreased while HDL-c was significantly ($P<0.05$) increased in rabbits treated with ginseng alone as compared to control animals. The presence of ginseng with $SnCl_2$ caused significant ($P<0.05$) decrease in the induction in the levels of TC, TG and LDL-c and significant ($P<0.05$) increase in the reduction HDL-c due to treatment with $SnCl_2$ and this means that ginseng had protective effect against the toxicity of $SnCl_2$.

DISCUSSION

The present study showed that treatment of adult rabbits with $SnCl_2$ caused increase in lipid profile (Table No.1 and Figures No.1 and Figure No.2). Exposure to environmental pollutants caused changes in lipids profile[21,22]. The increase in plasma lipids due to $SnCl_2$ administration (Table No.1) indicates a loss of membrane integrity[21]. In addition, the current think about uncovered that organization of Panax ginseng to hyper-cholesterolemic rabbits for twelve weeks created a noteworthy lessening in TC, TGs, LDL and VLDL; whereas, a noteworthy reduction in TC, TGs, LDL and VLDL; while, a significant increase in HDL level was observed in dose-dependent manner as shown in Table No.2. These results are in agreement with the work of[23] who studied the effect of Panax ginseng on hyper-cholesterolemic patients, for two months and also agree with[24] who studied the effect of Panax ginseng on hyper-cholesterolemic mice for 11 weeks and also with other studies[25]. Lipoprotein lipase (LPL) catalyzes the hydrolysis of the triacylglycerol component of

circulating chylomicrons and exceptionally moo thickness lipoproteins (VLDL), subsequently giving non-esterified greasy acids and 2-monoacylglycerol for tissue utilization[26,27]. Think about, TG level diminished and HDL-C level expanded after organization of 100-mg and 200-mg measurements of ginseng but these impacts were not factually noteworthy. The result of this think about is steady with our possess ponder. The test measure and think about term and ginseng measurement is comparable to that utilized in our consider. Within the think about of[28] organization of a 40-mg measurements of ginseng twice day by day, had no impact on lipid profile. This may due to moo dose of ginseng compared to our ponder. The length of this consider was longer than our own and the test measure was comparable to our think about. According to[29,30], ginseng sapon in reduced the blood cholesterol concentration by increasing cholesterol secretion through bile acid synthesis[31]. Reported that blood cholesterol content decreased by promoting LDL receptor synthesis, contrary to our results. On the other hand[32], claimed that the administration of ginseng ginseng side was not effective in lowering blood cholesterol in hypercholesterolemic rabbits, which was consistent with our results.

Table No.1: Plasma Cholesterol , triglycerides, high density lipoprotein, low density lipoprotein and very low density lipoprotein of male rabbits treated with ginseng, stannous chloride ($SnCl_2$) and their combination

S.No	Lipids Profile (mg/dl)	Experimental groups			
		C	Gin	$SnCl_2$	Gin + $SnCl_2$
1	Cholesterol	119.9 ± 1.562c	113.76 ± 3.194d	124.9 ± 1.553a	119.44 ± 1.038b
2	TG	56.49 ± 1.143c	43.08 ± 0.906d	58.22 ± 1.455a	55.09 ± 1.125b
3	HDL	44.45± 0.347b	41.72± 0.653a	46.18 ± 0.546d	44.86 ± 0.323c
4	LDL	63.73 ± 0.614c	60.79 ± 0.638d	69.62 ± 1.557a	62.91 ± 0.817b
5	VLDL	11.42 ± 0.201c	10.80 ± 0.093d	11.82 ± 0.118a	11.32 ± 0.185b

Values are expressed as means ± SE; n=10 for each treatment group. Mean values within a row not sharing a common superscript letters (a, b, c, d) were significantly different, $p<0.05$.

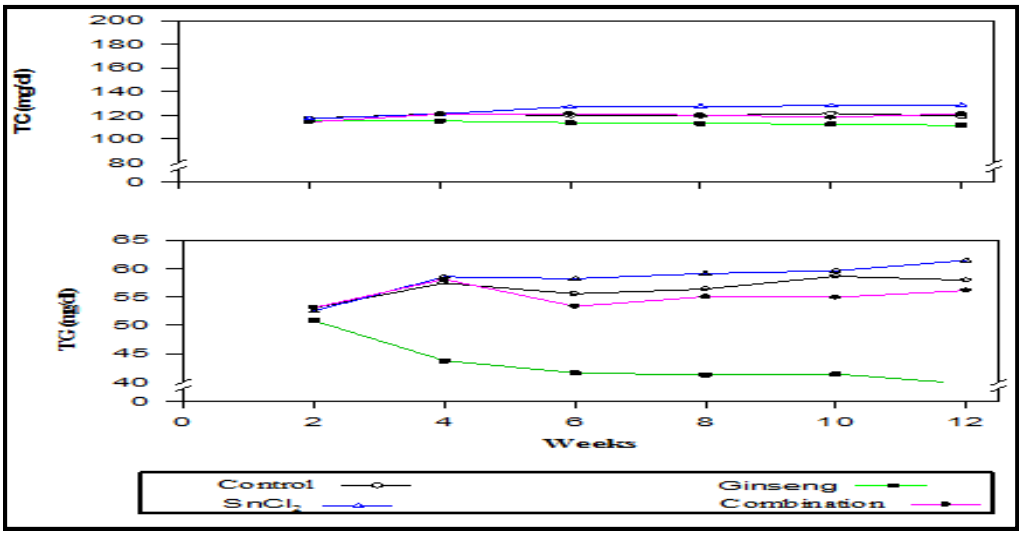

Figure No.1: Changes in blood of plasma cholesterol (TC) and triglyceride (TG) during treatment of male rabbits with ginseng, stannous chloride (SnCl2) and/or combination

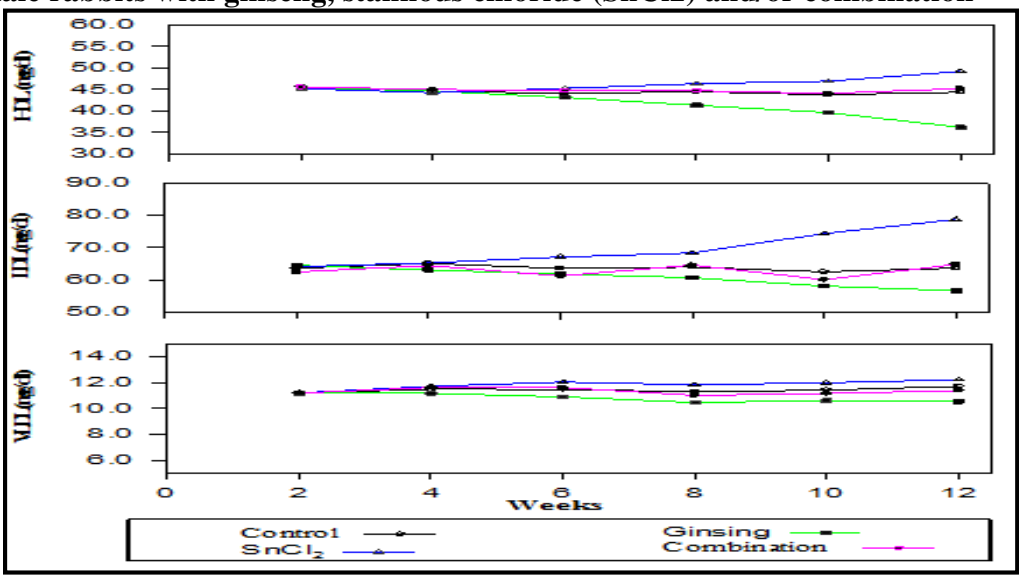

Figure No.2: Changes in activity of plasma high density lipoprotein(HDL), low density lipoprotein(LDL) and very low density lipoprotein (VLDL) during treatment of male rabbits with ginseng, stannous chloride(SnCl2) and/or combination

CONCLUSION

The difference within the impact of ginseng on bringing down cholesterol within the blood can be attributed to the composition of ginseng extricate utilized within the tests, doses, and exploratory periods.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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