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The Effect of Antischemin on Fat Metabolism in Diabetes

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Abstract— *Diabetes is a serious chronic metabolic disease, and it is imperative to use advanced herbal safe medicines with anti-diabetic compounds in addition to synthetic medicines for recent treatments. Rabbits were divided into 4 groups; group 1 or healthy group, group 2 or control group without medication, group 3 or experimental group with Antischemin (1:1:1) at 100 mg/kg, and group 4 or comparing group with Clopidogrel with 2.14 mg/kg orally for 5 days respectively and 5 days after a 6% Alloxan monohydrate (Sigma Chemicals, USA) solution was injected through rabbit ear IV with 60 mg/kg by Lukenes (1948); Gaulton et al (1985) method and created diabetes model developed a pathogenic disorder for diabetes. Specific parameters such as CH, TG, LDH and HDL concentration were measured on day 3, 7, 14, 21 and 28. Antishemin preparation effect of decreasing glucose by 5.36-25.9%, cholesterol by 18.3-57.1%, triglycerides by 26-35.7% and LDL by 64.1-76%, respectively and increasing HDL by 11.2-48.5%, indicating that it may related to decreasing hyper coagulation of microvasculature in organs and accelerating metabolic rate. Antishemin preparations have been shown to have a positive effect on CH, TG, LDL reduced by respectively and HDL increased during diabetes.*

Keywords— *Fat metabolism, cholesterol, triglyceride, low density lipoprotein, high density lipoprotein.*

I. INTRODUCTION

Diabetes is one of the most common non-communicable diseases that is one of the leading cause of mortality [1]. Diabetes is a serious chronic metabolic disease, and it is imperative to use advanced herbal safe medicines with anti-diabetic compounds in addition to synthetic medicines for recent treatments [2]. There are more than 1000 anti-diabetic herbals in traditional medicine [3], one of which is Astragalus membraneceus contains isoflavonoid, saponin,gluctosa, fructose, sucrose and gamma aminobutyric acid, selenium, betain, linoleic acid, sytosterol, cholin of 21 amino acids. In our country, most common disease such as atherosclerosis and diabetes, the main cause of the vascular endothelial damage causing metabolic imbalance in vital organs such as brain and heart is the oxygen deficiency and proton-electron flow loss of "9-step circuits of proton-electron flow in 14 billion cells of human body" [4-9]. Thus, within pathophysiologic path multi-factor dependent levels, producing autoimmune reaction and hypersensitivity inhibiting medicine in hepatic, renal and autoimmune disease as prevention and management is one of the most pressing issues in the medical field of our country [10].In case of diabetes and cerebral ischemic disease,our goal is to produce active, herbal drug that is grown in Mongolia and less costing, in order to prevent from energy exchange and metabolism imbalance of vital organs such as brain and heart due to vascular wall damage.

II. MATERIALS AND METHODS

The study was conducted by the Center for Innovation of the New Medicine Medical University, ELISA laboratory, Gyals center and Pretcilab laboratories and selected 30 healthy rabbits weighing 2.3-2.8 kilograms from national biotechnology industry in Mongolia. Rabbits were divided into 4 groups;group 1 or healthy group, group 2 or control group without medication, group 3 or experimental group with Antischemin (1: 1: 1) at 100 mg / kg, and group 4 or comparing group with Clopidogrel with 2.14 mg/kg orally for 5 days respectively and 5 days after a 6% Alloxan monohydrate (Sigma Chemicals, USA) solution was injected through rabbit ear IV with 60 mg/kg by Lukenes (1948); Gaulton et al (1985) method and created diabetes model. developed a pathogenic disorder for diabetes. Specific parameters such as CH, TG, LDH and HDL concentration were measured on day 3, 7, 14, 21 and 28.

III. RESULTS

In control group without treatment, glucose in plasma increased up to 34.3-43.8% in days 3-28. During this period, Antishemin group glucose concentration decreased by 5.3-25.9% immediately than control group ($P \leq 0.001$).

In control group without treatment, CH increased up to 34.5-65.3%-% in days 3-28, indicating that severe fat metabolism loss occurs in diabetis. During this period, Antischemin group CH decreased by 18.3-57.1% immediately than control group ($P \leq 0.001$).

In control group without treatment, TG in plasma increased up to 15.1-63.9% in days 3-28. During this period, Antishemin group TG concentration decreased by 26-35.7% immediately than control group ($P \leq 0.001$).

In control group without treatment, LDL in plasma increased up to 8.6-83%- in days 3-28. During this period, Antishemin group TG concentration decreased by 64.1-76% immediately than control group ($P \leq 0.001$).

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TABLE 1. The effect of Antischemin on serum biochemical parameters in alloxan-induced diabetic rabbits

Parameters	Groups	Days of experiment				
		Day 3	Day 7	Day 14	Day 21	Day 28
Glucose mmol/L	Healthy	5.35±0.15	6.35±1.35	6.35±1.35	4.85±1.35	5.60±1.35
	Control	8.2±0.22**	9.86±0.98**	10.5±1.27**	8.64±0.43**	8.53±0.43**
	Antischemin 100 mg/kg	7.76±0.9	9.2±2.07	8.79±1.98*	7.24±0.19*	6.32±0.89**
	Clopidogrel 2.14 mg/kg	7.3±0.48*	10.77±2.05	9.2±2.04	8.84±1.43	6.93±1.36*
CH mmol/L	Healthy	1.08±0.75	0.79±0.03	0.89±0.03	0.63±0.03	0.60±0.03
	Control	1.8±0.83**	1.58±0.39**	1.36±0.04**	1.82±0.52**	1.61±0.19**
	Antischemin 100 mg/kg	1.47±0.81*	0.99±0.43**	0.70±0.06**	0.78±0.42**	0.74±0.36**
	Clopidogrel 2.14 mg/kg	1.34±0.88**	0.81±0.44**	0.69±0.01**	0.67±0.35**	0.85±0.03**
TG mmol/L	Healthy	1.40±0.56	1.03±0.02	1.03±0.02	1.23±0.02	1.02±0.02
	Control	2.1±0.17**	1.83±0.1**	1.61±0.03**	1.45±0.16	1.81±0.27**
	Antischemin 100 mg/kg	1.35±0.41**	1.28±0.24**	1.19±0.07**	1.01±0.64**	1.27±0.30**
	Clopidogrel 2.14 mg/kg	0.91±0.08**	0.92±0.06	0.94±0.05**	0.93±0.22**	0.84±0.08**
LDL mmol/L	Healthy	0.26±0.01	0.52±0.01	0.52±0.01	0.74±0.01	0.44±0.01
	Control	1.53±0.03**	0.97±0.02**	0.92±0.02**	0.81±0.11	0.72±0.02**
	Antischemin 100 mg/kg	0.37±0.02**	0.3±0.04**	0.22±0.06**	0.29±0.14**	0.19±0.06**
	Clopidogrel 2.14 mg/kg	0.18±0.01**	0.53±0.04**	0.52±0.07**	0.46±0.15**	0.29±0.02**
Plasma HDL mmol/L	Healthy	2.26±0.15	2.27±0.06	2.27±0.06	1.78±0.06	1.81±0.06
	Control	0.85±0.01**	1.37±0.02**	1.9±0.04**	1.32±0.18**	1.1±0.09**
	Antischemin 100 mg/kg	1.11±0.009**	2.1±0.06**	2.14±0.07*	2.14±0.16**	2.14±0.13**
	Clopidogrel 2.14 mg/kg	1.54±0.01**	2.21±0.05**	2.2±0.09*	2.28±0.07**	2.17±0.04**

*- When compared control group measurements with healthy group P≤ 0.05, P≤ 0.001
**- When compared treatment group measurements with control group P≤ 0.05, P≤ 0.001

In control group without treatment, HDL decreased by 25.8-83.7% in days 3-28, indicating that in organs such as brain and heart metabolism slows down leading to micro-circulation complications due to fat metabolism imbalance, high density lipoprotein loss and increase in cholesterol, triglyceride and low density lipoprotein. Due to the lack of normal electron and proton flow in the brain cells, that use high amount of oxygen, leads to ATP production reduced in mitochondrial internal membrane and fat metabolism turns into the most inefficient form. During this period, Antishemin group HDL increased by 11.2-48.5% immediately than control group (P≤0.001).

IV. Discussion

In alloxan-induced diabetes model, starting from day 3-28, in non-treated group, we shared same result with previous study with glucose increased by 34.7-43.8%, cholesterol by 34.5-65.3%, triglycerides by 15.1-63.9% and LDL by 38.8-46.4% respectively. Besides, decreasing HDL by 25.8-62.3%, it decreases fat metabolism by alloxan effect, thus affecting coagulation negatively by activating thrombocyte binding and aggregation. Antishemin preparation effect of decreasing glucose by 5.36-25.9%, cholesterol by 18.3-57.1%, triglycerides by 26-35.7% and LDL by 64.1-76%, respectively and increasing HDL by 11.2-48.5%, indicating that it may related to decreasing hyper coagulation of microvasculature in organs and accelerating metabolic rate. This study is consistent with experimental studies of Zayed AE and Saleh A in the study of the effects of Gingko bilobi on plant based fat metabolism in diabetes [11].

V. Conclusion

Antishemin preparations have been shown to have a positive effect on CH, TG, LDL reduced by respectively and HDL increased during diabetes.

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