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THE EFFECT OF THE ETHANOLIC EXTRACT OF MAERUA PSEUDOPETALOSA ROOTS AND SOLANUM DUBIUM FRUITS ON LIPID PROFILE AND BODY WEIGHT IN WESTAR ALBINO RATS

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ABSTRACT

This study was carried to evaluate the effect of the ethanolic extract of maerua pseudopetalosa roots and solanum dubium fruits on lipid profile and body weights in westar albino rats. Rats were checked for lipid profile on the zero day and then fed high cholesterol diet for two weeks and again checked for blood lipid profile. Rats were then divided into four groups each of six rats. Group one left on normal diet and water ad libitum. Group two was administered atorvastatin, group three solanum dubium fruit extract and group four maerua pseudopetalosa ethanolic root extract. The negative control group uprising gained weight through time of the study while the lipid profile change was not significant with the exception of cholesterol after the withdrawal of the high lipid diet. The positive control group (atorvatstatin), exhibited a pronounceable change in the lipid profile with significance ($p \leq 0.05$) in the LDL value. A noticeable weight and lipid profile change took place in the group administered solanum fruit extract with significance in the LDL value. Group administered maerua root extract also exhibited remarkable change in weight and lipid profile specially with cholesterol and hdl values. The study concluded that ethanolic extract of both solanum dubium fruit and maerua pseudopetalosa are quite effective in lowering blood lipid profile with comparable results of the known ethical medications. Worth to be mentioned that these results are the first to be introduced in the medical literature.

KEYWORDS: Solanum, maerua, ethanolic extract, lipid profile, westar albino rats.

INTRODUCTION

One of the major reasons of cardiac diseases, strokes and sudden death is high blood lipid profile presented as hypercholesterolemia, triglyceridemia, high values of low density lipoproteins together with low value of HDL. (Vanessa Gregorin Coelho et al, 2005).[1] Ethical medications used to lower blood lipid profile are of many drawbacks of which is their high price and their side effects. The food and drug administration consumer magazine reported many side effects on statin use including the possibility of inducing diabetes, loss of memory and muscle and liver damage, (FDA, 2014).[2] Herbal medicine is nowadays getting growing scores of value due to its availability, safety and reasonable price.

Maerua pseudopetalosa, of family capperacae is growing in a wide range of Sudan in a strip starting south of kordofan in the west extending to the south of blue nile province in the damazin area. Native people use the plant roots as chest rub to alleviate cough and also used by natives as a powder to treat diabetes.

Solanum dubium of family solanaceae is growing in scattered area of Sudan indiscriminatively in south, west, north, east and in the middle regions of the country. The fruit juice and aqueous extract is used by natives to turn milk into cheese. A previous study was carried by university of Khartoum to prove this hypothesis, (El Owni et al, 2011).[3]

Maerua roots is usually collected during autumn since the plant annually grows during the season. Solanum grows all seasons of the year.

OBJECTIVE

The objective of this study is to evaluate the effect of the ethanolic extract of solanum dubium and maerua pseudopetalosa.

MATERIALS AND METHODS

In this study the method of E. N. Onyeike, et al (2012).[4] was used with little modification. A number of twenty four westar albino rats turned hyperlipidimic after being kept on high lipid diet containing 1% egg yolk and 1% ground nut oil for two weeks. Lipid profile of the blood was checked on the zero day (before the high lipid diet) and on the fourteenth day after the high lipid diet. Rats were checked for their weights on the zero and fourteenth day and the blood was withdrawn from the retroplexus area of the rat eye using lithium heparin capillary

and kept till analysis in lithium heparin containing tubes. Rats were divided into four groups each of six rats and fed normal diet. Negative control group was only kept on normal diet and water ad libitum. Positive control group was administered atorvastatin at a dose of 10mg/kg body weight (Emmanuel Ngbede, 2012).[5] The brand of atorvastatin used was atorvazal of the local factory AZAL. Third group was orally administerd 80% ethanolic extract of solanum dubium in a dose of 400mg/kg body weight once/day. Fourth group was administered 200mg/kg body weight/day of 80% ethanolic extract of maerua pseudopetalosa. This protocol was kept on for fourteen days and then blood was taken for analysis of lipid profile, cholesterol, triglycerides, and low density lipoproteins (LDL) and high density lipoprotein (HDL).

RESULTS

Weights and lipid profile change in rats when orally administered solanum and maerua ethanolic extract and atorvastatin.

Groups	Parameters± SEM	Time (days)			P. Value
		0/day	14/days	30/days	
Control	Weight	120.67±8.671	146.33±6.097	145±9.5	.005
	CHOL	58.8±7.183	52.50±3.243	38.83±1.922	.004
	TG	60.50±6.386	95.00±9.619	61.00±13.680	.051
	HDL	58.17±6.019	60.00±3.425	45.83±4.003	.094
	LDL	5.00±.931	5.00±.894	3.33±.494	.295
10mg/kg Atorvastatin	Weight	123.83± 3.36	131.00±3.95	127±6.1	.500
	CHOL	46.33±3.58	60.17±5.36	47.33±4.66	.091
	TG	53.17±4.26	83.17±16.64	64.00±5.92	.157
	HDL	44.00±4.80	55.50±3.28	49.50±7.99	.385
	LDL	3.00±068	8.33±1.36	6.33±.56	.004
400mg/kg solanum dubium extract	Weight	125.00±4.757	129.83±8.522	137±11.4	.915
	CHOL	49.17±2.548	98.33±44.797	36.17±2.056	.235
	TG	60.00±8.903	160.00±66.758	93.67±10.471	.221
	HDL	49.50±4.581	67.00±20.146	34.00±1.461	.183
	LDL	4.83±1.014	12.00±2.910	4.40±1.166	.027
200mg/kg maerua pseudopetalosa	Weight	154.33±6.227	174.00±9.103	189±9.6	.059
	CHOL	51.17±2.701	58.33±2.813	45.67±2.539	.015
	TG	56.83±6.615	80.17±12.134	83.67±8.667	.125
	HDL	52.67±3.938	62.33±2.044	43.17±3.049	.002
	LDL	4.50±1.643	9.00±3.742	7.17±3.430	.058

SEM = standard error of mean.

DISCUSSION

It is very clearly observable that all the lipid parameters in all the four groups has got a remarkable rise when fed the high lipid diet and the lipid profile decreased noticeably in all groups except for the triglycerides in the group administered maerua extract. For maerua extract the persistence of high triglycerides can be explained by the fact that maerua root part is rich in naturally occurring sugars. (Nicolas Cyrille Ayessou et al, 2009).[6] Solanum dubium ethanolic extract lowered all the lipid parameters with significant effect ($P \leq 0.05$) on the (LDL), in comparison with maeua extract which has its significant effect on cholesterol. It is also to be mentioned that both maerua and solanum extract has shown their lowering activity on all four tested lipid profile with values comparable to the negative and positive control groups. This could be justified by the possibility that both extracts contain all types of lipid lowering agents as statins, bile acids, nicotinic acid and fibrates.

CONCLUSION

Though values of lipid parameters obtained for rats are within the normal levels before and after treatment with the ethanolic extracts of both plants, the decrement in the level of lipid profile proof that both extracts contain lipid lowering agents those should be further subjected for modern pharmaceutical techniques of isolation to be processed into medications.

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