Therapeutic Effect of Artemisia *Herba- Alba* Aqueous Extract Added to Classical Therapy of Acquired Hyperlipidemia

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Background: The acquired hyperlipidemia presents a great challenge now for population of world, this need a real attention and dietary modification or sometimes treatment with statins [HMG-CoA reductase inhibitors] or Fish omega-3 fatty acids (FAs) to reduce the cardiovascular risk. The herbal compositions of some inventions are synergistic in their effect and daily ingestion of such compositions of the inventions is an effective therapeutic method of achieving such cardiovascular risk control without the troublesome side effects on the liver, digestive system, and kidneys associated with synthetic drugs.

Objectives: This study designed to test the therapeutic effect of Artemisia *herba- Alba* aqueous extract added to classical therapy of acquired hyperlipidemia.

Materials and methods: Seventy hyperlipedemic patients are divided on two groups: Group- A used simvastatin 20 mg (actavis-UK) 1 tablet plus omega 3 [eicosapentaenoic acid "EPA" 480 mg. and docosahexaenoic acid "DHA" 300 mg] (T & D- Germany), at night for two months. The other Group (Group- B) used the same previous drug regimen with only five milliliter of the aqueous solution prepared from *Artemisia herba- Alba* lyophilized extract at night for two months.

Results: Pre- and post treatment of cholesterol and triglycerides levels for both groups are analyzed statistically using paired t-test on 0.01 level, indicate a significant reduction of both lipid parameters after treatment by the two drug regimens. *Artemisia herba-Alba* aqueous extract addition to therapy shows significant reduction of cholesterol concentration in the blood: P* <0.01 =0.000637 while it is not affected significantly on triglycerides levels: P* > 0.01 =0.020137.

Artemisia herba-alba aqueous extract shows significant reduction of cholesterol concentration in the blood: P* <0.01= 0.0006 while it is not affected significantly on triglycerides levels: P* > 0.01= 0.0201 those findings present a different results compared to previous study, used a combination of dry herbs of *Artemisia herba-alba* and *Nigella sativa*. This combination shows non-significant reduction of both lipid parameters under scope.

Conclusion: *Artemisia herba Alba* aqueous extract could present a good adjuvant to hyperlipidemia classical therapy compared to consuming the crude herb without any further modification like extraction.

Keywords: *Artemisia herba-Alba*, Therapy, Hyperlipidemia.

Introduction:

The acquired hyperlipidemia presents a great challenge now for population of world, this need a real attention and dietary modification or sometimes treatment with statins [HMG-CoA reductase inhibitors] to reduce the cardiovascular risk [1].

In addition, Fish omega-3 fatty acids (FAs) namely (EPA) and (DHA) posses a lot of properties that can explain their positive impact on cardiovascular events had seen both in epidemiological and interventional studies [2]. The Patients should consume both DHA and EPA [3]. The target DHA and EPA consumption levels are about 1 g/d for those with known coronary artery disease and at least 500 mg/d for those without disease [4]. Combination therapy with omega-3 fatty acids and a statin is a safe and effective way to improve lipid levels and cardiovascular prognosis beyond the benefits provided by statin therapy alone [5]. Very importantly, omega-3 FAs have synergistic and additive effects on plasma lipids when co administered with statins. Another practical implication of such studies is the proven safety of omega-3 FAs add on therapy to statins [5-6]. The herbal compositions of some inventions are synergistic in their effect and daily ingestion of such compositions of the inventions is an effective therapeutic method of achieving such control without the troublesome side effects on the liver, digestive system, and kidneys associated with synthetic drugs [7].

Artemisia herba-alba [white wormwood] Family: Asteraceae, *Artemisia herba-alba* could constitute a good adjuvant to combat obesity, hyperglycemia, hypertriglyceridemia, hypercholesterolemia and particularly oxidative stress [8]. It has shown to have an antihyperglycaemic and antihyperlipidemic effect on established high fat diet induced diabetes in mice [9]. Aqueous extract of the aerial part from *Artemisia herba-alba* showed considerable lowering of serum total cholesterol, triglycerides, low-density lipoprotein, and an increase in high-density lipoprotein in alloxan-induced diabetic rats [10]. The human adult dose of *Artemisia herba-alba* is 3- 5 gm of dry herb per day [11]. The median lethal dose fifty (L.D50) of 70% alcoholic extract of *Artemisia herba-alba* (Asso.) herbs is found to be 3g/kg of body weight [12].

Aim of the research:

To evaluate the therapeutic effects of aqueous extract of *Artemisia herba-alba*, added to classical therapy of hyperlipidemia.

Materials and Methods:

Preparation of the natural extract

Highly qualified and authenticated, *Artemisia herba-alba* [aerial parts], powdered in a mixer-grinder and aqueous extract was prepared from that

powder by sequential infusion extraction method [13]. The aqueous extracts are mixed and filtered many times to yield a clear filtrate, which then lyophilized by (phytes blotek sdn bhd laboratories- Malaysia) to yield a faint yellow powder ready for reconstitution by water. Ten kilograms of the dry herb is producing about two percent of its weight as lyophilized powder, which is distributed in sterilized plastic bottles each contains two gram of the lyophilized powder ready to reconstitution by distilled water to form one hundred milliliters solution.

Preparation of Patients groups:

This study had conducted in Baghdad, between August and September 2011. Patients selected to enter the present study are suffering from hyperlipidemia fasting blood cholesterol, more than 200 mg/ dl [14] and fasting blood triglycerides, more than 150 mg/ dl taking as a cut point for both male and female [15] their age is between 40-55 years and twenty three of them were females. Pregnant women were excluded from this study, and written consent obtained from the study subjects.

By randomized open-label trial seventy hyperlipedemic patients are divided randomly on two groups: Group- A used simvastatin 20 mg (actavis-UK) 1 tablet plus omega 3 [EPA 480 mg. and DHA 300 mg] (T & D- Germany), at night for two months. The other Group (Group- B) used the same previous drug regimen with only five milliliter of the aqueous solution prepared from *Artemisia herba-alba* lyophilized extract at night for two months.

Statistical analysis:

Pre- and post treatment of cholesterol and triglycerides levels for both groups are analyzed statistically using paired t-test and the post treatment levels for each lipid parameter of both groups are analyzed using unpaired t-test [16] **.**

Results:

Fasting blood lipids in mg/dL checked at 10 o'clock morning, before taking the treatment and on monthly interval for two months after taking the treatment. The pre- and post-treatment mean of lipids, standard deviation (SD) and standard error of mean (SEM) for each group are shown in tables (1-2). The statistical analysis of both treatment regimen showed that, all of them are well effective in treatment of acquired lipidemia. By significant reduction of lipids parameters: P*< 0.01 for cholesterol levels [P- value for paired t-test conducted on group A= 7.18061E-12 while that of group B is 5.31785E-13], and for triglycerides level are [P- value for paired t-test conducted on group A= 7.02632E-12 while that of group B is 5.10938E-13]. Figures (1-2) are well demonstrated the therapeutic effects of both treatment regimens.

Discussion:

We can observe that this extract shows significant reduction of cholesterol concentration in the blood: P*<0.01=0.0006 while it is not affected significantly on triglycerides levels: P* > 0.01= 0.0201 those findings present a different results compared to previous study, used a combination of dry herbs of *Artemisia herba-alba* and *Nigella sativa*.

This combination shows non-significant reduction of both lipid parameters under scope [17]. Other studies conducted on laboratory animals can demonstrate here, as matter of comparison, one of those is the study of the effect of *Artemisia herba-alba* and *Teucrium polium* on blood glucose levels. The results concluded that administration *A. herba-alba* might be useful in preventing hyperglycemia by having insulin-like action and can significantly reduce the blood glucose in normoglycemic and hyperglycemic rabbits but do not shows any action on creatinine and cholesterol in both normal and STZ-induced diabetic rabbits in acute diabetic experiment [18]. Other research, which was stated that the aqueous extracts of *Artemisia herba-alba* have been tested on male albino rats. The results demonstrated that administration of *A. herba-alba* in a dose of 100 mg/kg of body weight for 60 days induced a very significant decrease in glucose level with a significant increase in total serum cholesterol level, triglycerides, phospholipids, serum aspartate aminotransferase (AST) and serum alanine aminotransferase (ALT) [19]. Moreover, Artemisia decoction significantly decreased the plasma glucose, triglyceride, and cholesterol levels between 29%, 40%, and 17% [8].

Conclusion:

Artemisia herba Alba aqueous extract could present a good adjuvant to hyperlipidemia classical therapy compared to consuming the crude herb without any further modification like extraction.

A recent research was utilizing one species of *Artemisia* genus, which is *iwayomogi*; can help to give a hint about *Artemisia* as an antihyperlipidemic plant. In this study, a 95% ethanol extract of *Artemisia iwayomogi* (95EEAI) was identified as a potent ligand of peroxisome proliferators activated receptor δ (PPARδ) using ligand binding analysis and cell-based reporter assay. In cultured primary human skeletal muscle cells, treatment of 95EEAI increased expression of two important PPARδ-regulated genes, Carnitine palmitoyl-transferase-1 (CPT1) and pyruvate dehydrogenase kinase isozyme 4 (PDK4), and several genes acting in lipid efflux and energy expenditure. Furthermore, 95EEAI stimulated fatty acid oxidation in a PPARδ-dependent manner.

High-fat diet-induced obese mice model further indicated that administration of 95EEAI attenuated diet-induced obesity through the activation of fatty

acid oxidation in skeletal muscle. These results suggest that a 95EEAI may have a role as a new functional food material for the prevention and/or treatment of hyperlipidemia and obesity [20].

Table (1): Triglycerides levels mean before and after treatment of seventy hyperlipidemic patients with statistical analysis

	Group A(no.=35)		Group B (no.=35)	
	Before treatment	**After treatment**	**Before treatment**	**After treatment**
Mean	201.43	154.86	200.57	145.29
SD	33.09	20.35	33.71	17.86
SEM	5.59	3.44	5.7	3.02
[Unpaired t- test on 0.01 level at df =67]Critical (tabulated) t- value=2.383302 and statistical (calculated) t-value=2.091528 , P value=0.020137				

Table (2): Cholesterol levels mean before and after treatment of seventy hyperlipidemic patients with statistical analysis

	Group A(no.=35)		Group B(no.=35)	
	Before treatment	**After treatment**	**Before treatment**	**After treatment**
Mean	305.86	196.57	296.43	175.14
SD	68.73	32.01	73.53	19.27
SEM	11.62	5.41	12.43	3.26
[Unpaired t- test on 0.01 level at df =56]Critical (tabulated) t- value=2.394801and statistical (calculated) t-value=3.393046, P value=0.000637				

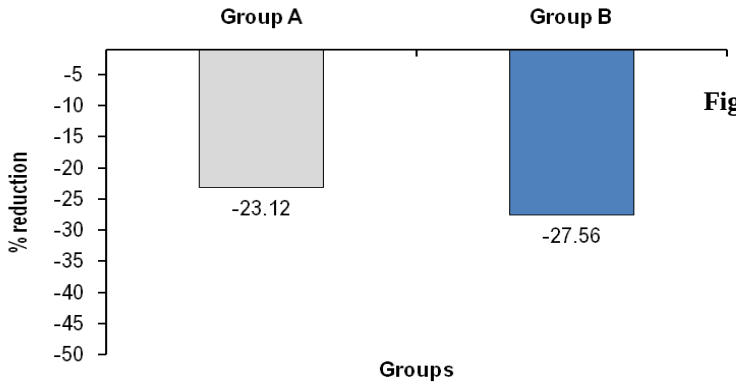

Fig. 1 Percent reduction in triglycerides (TG) in patients received simvastatin + omega3 and those received simvastatin + omega-3 + herbal medicine unpaired t-test between post treatment triglycerides levels of both groups shows a non-significant reduction P>0.01= 0.02.

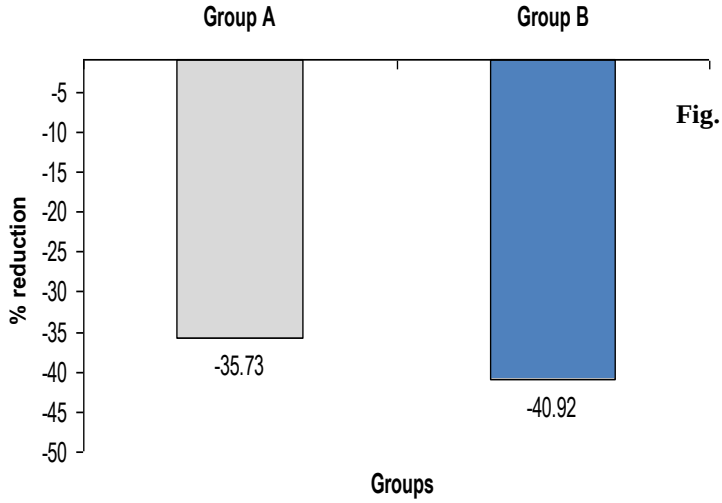

Fig. 2 Percent reduction in total cholesterol (TC) in patients received simvastatin + omega-3 and those received simvastatin + omega-3 + herbal medicine unpaired t-test between post treatment cholesterol levels of both groups shows a significant reduction P< 0.01= 0.0006.

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