Consumption of Argane oil improves anti-oxidant and lipid status in hemodialysis patients.

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Hémodialyse, stress oxydant, huile d'argane, vitamine E.

RESUMÉ

L'hémodialyse est un processus qui induit un stress oxydant chez les patients, et avec la dyslipidémie, ils sont responsables d'une forte morbidité et mortalité au sein de cette population. L'huile d'argane est connue pour ses capacités anti-oxydantes et modulatrices des lipides du sang. Au cours d'une étude clinique croisée, nous avons testé l'effet de la consommation de l'huile d'argane sur le niveau de vitamine E et les paramètres du stress oxydant (malondiladéhyde et les LDL-cholesterol oxidés). Nos résultats ont montré que la consommation de l'huile d'argane améliore le taux de vitamine E et les paramètres du stress oxydant. Cette huile pourrait, donc être utilisée comme moyen préventif contre certains risques cardiovasculaires chez les patients hémodialysés.

Keywords :
Hemodialysis, oxidative stress, argane oil, vitamin E.

ABSTRACT

The hemodialysis is a process, which induces an oxidative stress among patients, and it is responsible with the dyslipidemia of a high morbidity and mortality within this population. Argane oil is known for its anti-oxidant and modulatory abilities of blood lipid. During a crossover clinical study, we tested the effect of the consumption of argan oil on blood level of vitamin E and oxidative stress parameters (malondiladehyde and oxidized LDL-cholesterol levels). Our results showed that the consumption of argane oil improves the rate of vitamin E and the oxidative stress parameters, and thus, this oil could be used as a preventive measure against certain cardiovascular risks in hemodialysis patients.

Introduction :

High score of mortality and morbidity in hemodialysis patients is known to be linked to cardiovascular risk factors (Go et al. 2004), such as abnormal blood lipid levels (Shoji et al. 2001) and oxidized lipoproteins (Honda et al. 2012). Oxidative stress is also a medical condition that is induced mainly by the membrane-associated hemodialysis process (Clermont et al. 2000, Tetta et al. 1999, Batta et al. 2010, Elkabbaj et al. 2012). Thus, targeting dyslipidemia and oxidative stress consequences should be of therapeutic value in hemodialysis patients. Argane oil is known as a lipid modulator diet and proved as antioxidant in several studies (Batta et al. 2013, El Jaoudi et al. 2015, Ould Mohamedou et al. 2011). It is used in Moroccan traditional medicine as a valuable remedy for many health conditions (Monfalouti et al. 2010).

Objectives:

We sought to investigate the effect of argane oil consumption on lipid profile and antioxidant status in hemodialysis patients.

Patients and Methods :

In a crossover, controlled trial, 37 patients (18 men, 19 women) with end-stage renal disease on maintenance hemodialysis, were randomly assigned to 4-week argane oil consumption (Table 1 and figure 1). Patients who were assigned to argane oil treatment group received argane oil to be consumed every morning (30 ml per day) for 4 weeks, while patients who were assigned to control group had no treatment. Fasting plasma lipids, vitamin E, and oxidized LDL (ox-LDL) were analyzed according to El Jaoudi et al. 2015. Malondialdehyde (MDA) (El Kabbaj et al. 2012) was determined before and after the hemodialysis session, as an indicator of oxidative stress-induced fatty acid damage. Differences were considered as significant when p values were ≤ 0.05.

Table 1. *Anthropometric informations*

Variable	*Value*		*p*
	Groupe A	**Groupe B**	
Sexe M/W	**8/11**	**10/8**	**0.35**
Age (years)	**50.7 ± 16.5**	**47.9 ± 21.5**	**0.21**
Duration in hemodialysis (months)	**36 (6 –132)**	**39 (13 –115)**	**0.29**

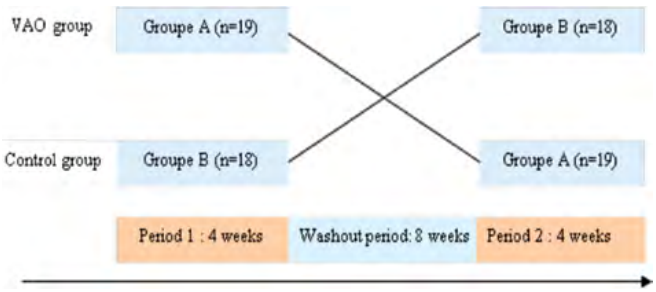

Figure 1 : *crossover clinical study on virgin argane oil (VAO) consumption by hemodialysis patients.*

Results :

Upon argane oil consumption (table 2), there was no significant difference in serum total cholesterol, triglyceride, LDL-chol and ox-LDL, however, HDL-chol levels were significantly higher after argane oil consumption. Plasma vitamin E contents significantly increased from baseline only in argane oil-group ($p<0.001$). Hemodialysis session increased MDA levels, but the increase in argane oil group was less than in the control group (table 3).

Table 2. *Changes of Body mass index (BMI) and lipid status before and after trial*

Variable	*Groupe*	*Period 1*			*Period 2*		
		Week 0	Week 4	P	Week 0	Week 4	p
BMI (Kg/m2) m ± sd	A	23.1 ± 2.9	23.2 ± 2.9	0.85	23.1 ± 3	23.2 ± 2.8	0.71
	B	23.3 ± 3.4	23. 3 ± 3.5	0.66	23.4 ± 3.5	23.4 ± 3.31	0.53
TG (g/L)	A	1.27±0.46	1.30±0.47	0.70	1.35±0.42	1.36±0.41	0.56
	B	1.35±0.55	1.36±0.61	0.63	1.18±0.74	1.07±0.56	0.42
CT (g/L)	A	1.60±0.43	1.59±0.36	0.97	1.64±0.38	1.65±0.35	0.88
	B	1.63±0.34	1.64±0.38	0.49	1.58±0.3 8	1.52±0.31	0.38
LDL (g/L)	A	1.00±0.36	0.94±0.39	0.40	1.02±0.35	1.03±0.32	0.79
	B	1.02±0.35	1.03±0.36	0.69	0.99±0.35	0.89±0.30	0.18
HDL (g/L)	A	0.35±0.08	0.39±0.09	0.02	0.35±0.07	0.35±0.06	0.62
	B	0.34±0.05	0.36±0.06	0.80	0.35±0.10	0.41±0.11	0.003

Table 3. *Changes of antioxidant status and lipid peroxidation status before and after trial*

Variable	*Group*	*Period 1*			*Period 2*		
		Week 0	Week4	p	Week0	Week4	p
ΔMDA (µMol/L)	A	2.50 ±0.89	1.94 ±1.05	0.045	2.12 ±0.74	2.35 ±0.95	0.59
	B	2.76 ±0.53	2.73 ±1.18	0.91	2. 34 ±0.88	1.57 ±0.97	0.038
OxLDL (U/L)	A	33.29 (21.23 - 89.31)	34.29 (22.43 - 93.08)	0.41	38.27 (26.12 - 91.28)	35.76 (23.57 - 104.16)	0.57
	B	35.15 (20.16 - 95.41)	36.74 (24.44 - 93.96)	0.39	35.65 (20.67 - 93.28)	34.78 (23.18 - 86.26)	0.38
Vitamin E	A	7.89 ±2.37	10.97 ±3.3 1	0.001	8.93 ±2.60	8.46 ±2.17	0.13
	B	8.17 ±2.41	8.51 ±1.81	0.31	9.21 ±2.03	12.41 ±2.66	0.001

Conclusions :

Argane oil consumption improves lipid profile and oxidative stress status in hemodialysis patients, and thus, it could be used against cardiovascular and cerebrovascular complications.

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