Effects of Vitamin E on Chronic Hepatitis C Genotype 3: A Randomized, Double-Blind, Placebo-Controlled Study

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Background: *Hepatitis C virus (HCV) infection is associated with chronic inflammation and oxidative damage, with hepatic steatosis being common in genotype 3 cases. Vitamin E, a potent antioxidant protective against oxidative stress-induced liver damage in vitro and in vivo, has beneficial effects on alanine aminotransferase (ALT) and histological outcomes in patients with non-alcoholic steatohepatitis.*

Objective: *To assess the effect of vitamin E on ALT status in patients with HCV genotype 3.*

Material and Method: *This randomized, placebo-controlled, double-blind trial was conducted in a single tertiary-care hospital (Rajavithi Hospital, Bangkok) between 2010 and 2011. We included patients with HCV genotype 3 infection, unable to receive or tolerate, or did not respond to standard therapy. Responders were defined as patients exhibiting a decrease in serum ALT of at least 5% below the baseline valueafter 12 weeks of treatment.*

Results: *Thirty-seven eligible patients were randomly assigned either to receive vitamin E 400 IU twice daily (n = 19) or placebo (n = 18; 1 dropped outearly) for 12 weeks.In all, 11of 19 patients in the vitamin E group (57.8%) and 5 of 17 patients in the placebo group (29.4%) were ALT responders. Among responders,serum ALT levels weregreatly decreased in the vitamin E group (reducing from 122.6±80.1 IU/L to 68.4±25.3 IU/L, p = 0.016), when compared withthe placebo group (reducing from 89.2±40.6 IU/L to 73.6±30.6 IU/L, p>0.05). Vitamin E treatment was well-tolerated with no serious adverse events in the present study.*

Conclusion: *Vitamin E treatment decreasedserum ALT levels in patients with HCV genotype 3. Because of its good safety profile, vitamin E may be a worthwhile supportive therapy for patients with HCV, particularly for those who were unable to achieve viral eradication by standard therapy.*

Keywords: *Vitamin E, Oxidative stress, Hepatitis C virus, Genotype 3, Alanine aminotransferase*

J Med Assoc Thai 2014; 97 (Suppl. 11): S31-S40
Full text. e-Journal: *http://www.jmatonline.com*

Chronic hepatitis C virus (HCV) infection is a major cause of chronic liver disease and hepatocellular carcinoma worldwide. Recent epidemiological studies have reported a global prevalence of chronic HCV infection of approximately 2%, representing 120-170 million people[1]. HCV treatment with pegylated interferon plus ribavirin results in a sustained virological response rate of approximately 50-60%[2]. However, both interferon and ribavirin are expensive and associated with numerous side effects that are not well tolerated by patients. As a result, many patients with chronic HCV, particularly those living in developing countries, do not undergo available therapies or are nonresponsive to current treatment regimens, which may be partly due to their inability to tolerate the full therapy. Therefore, both clinicians and patients have an interest in studying other potential alternative therapies to slow the progression of liver disease in these difficult HCV patients.

HCV infectionis characterized by systemic oxidative stress that is most likely caused by a complex combination of chronic inflammation, iron overload and proteins encoded by HCV[3]. The increased generation of reactive oxygen species (ROS), together with decreased intrahepatic antioxidant defense, is associated with ongoing lipid and protein oxidation, which promotes the development and progression of liver damage[3,4]. In addition, several studies have demonstrated that ROS might play an important role

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in the procarcinogenic effect of HCV infection by inducing host DNA damage[5-7]. Taken together, oxidative stress is believed to contribute substantially to the progression of liver fibrosis and to the risk of developing hepatocellular carcinoma during the course of HCV infection.

Several clinical studies have evaluated the role of antioxidant regimens in patients with liver disease of various etiologies[8,9]. Although somewhat controversial, antioxidant supplements have not demonstrated significant beneficial effects in most studies, including a recent Cochrane meta-analysis of 1,225 patients[8,9]. Among these investigated antioxidants, vitamin E is the most efficient natural, lipid-soluble antioxidant and has been shown to protect hepatocytes from oxidative damage in animal studies[10]. However, the available data on vitamin E monotherapy in patients with chronic HCV are limited. In a pilot study of vitamin E monotherapy in 23 HCV patients, a significant reduction in alanine amino-transferase (ALT) level was observed in 11 patients (48%), but neither complete ALT normalization nor virological response was seen[11]. Recently, vitamin E was shown to be effective in the treatment of nonalcoholic steatohepatitis (NASH)[12], a severe form of fatty liver disease that is pathogenetically linked to the state of insulin resistance and oxidative damage[13]. Fatty liver is very common in chronic hepatitis C, encountered in 40 to 86% of patients according to genotype[14]. Notably, HCV-induced hepatic steatosis and insulin resistance are primarily reported in patients with HCV genotype 3 infection and are associated with fibrosis progression and a reduced rate of sustained virological response to anti-HCV therapy[14]. Accordingly, the present study was conducted to evaluate whether treatment with vitamin E improves the aminotransferase status of patients with hepatitis C genotype 3.

Material and Method

Patients

The present study enrolled adults aged 18 years or older, who had chronic hepatitis C, based on the presence of anti-HCV antibody, detectable serum HCV-RNA and ALT level above the upper normal limit (>40 IU/L) and the exclusion of other causes of hepatitis by abdominal ultrasonography or liver histology. HCV genotype 3 was diagnosed in all patients. Patients were excluded if they were unable to take oral medications; used interferon within 90 days or ribavirin within 30 days prior to enrollment; used any investigational drug within 30 days before enrollment; were females of childbearing age who were either pregnant, breast-feeding, or not using birth control; had a history, physical examination, and laboratory findings showing evidence of cirrhosis; had a history of alcoholism or alcohol consumption of more than 40 g/day; had acute hepatitis A or were co-infected with HBV or HIV; had any alternative cause of liver disease; had a history of hypersensitivity or intolerance to vitamin E; and were clinically unstable or had any concomitant condition which would preclude participation in this trial. With regard to the possible confounding effect of other compounds that may contribute some antioxidant properties, the specified exclusion criteria included use of silymarin or other milk-thistle preparations, vitamin C, selenium, beta-carotene, glutathione, N-acetyl cysteine, or nonprescribed complementary alternative medications (including dietary supplements, high-dose multi-vitamins, herbal preparations, and special teas) within 30 days before screening. Subjects were also excluded if they were unwilling to refrain from taking these medications until completing the study.

Method

This randomized, double-blind, placebo-controlled study was conducted at a single tertiary-care hospital (Rajavithi Hospital, Bangkok, Thailand) between September 2010 and February 2011. The study protocol was reviewed and approved by the Medical Ethics Committee of Rajavithi Hospital (No. 21/2552) and the Research Committee of the Gastroenterological Association of Thailand. All participants provided informed consent before enrollment. Randomization was performed in a standard fashion using a randomization list kept in sealed envelopes, and investigators were blinded until the database was locked at the completion of the trial. Patients were randomly assigned into two treatment groups: 19 patients received a vitamin E 400 IU tablet (vitamin E 400 IU Natural; Dr. Fritz Bode GmbH, Rheinfelden, Germany) twice daily, and another group of 18 patients received one placebo tablet twice daily for 12 weeks. The vitamin E dose selected for this study was 800 IU per day, which has been used in previous clinical trials and provedto be safe and well tolerated in short- and long-term use for various indications[11,12]. Subjects were instructed to take study medications with food. Patients were followed-up at 0, 4, and 12 weeks during the treatment period. Serum HCV-RNA was measured by a quantitative assay (COBAS Amplicor 2.0®, Roche Molecular Diagnostics, Pleasanton, CA, USA; limit of

detection = 10 IU/mL), and HCV genotypic assay (Hepatitis C virus Genotype 2.0® Assay (LiPA) Line probe, Innogenetics, Ghent, Belgium) was also performed. Laboratory tests (liver function test: albumin, aspartate aminotransferase [AST], and alanine aminotransferase [ALT]) were also performed at each follow-up visit. At the time of each visit, patients were questioned regarding the occurrence and nature of any adverse events. All such events were recorded in the patients' medical records and case report forms. Adverse events were characterized as simple or life-threatening and assessed by causality as probably related, possibly related, unlikely to be related or not related to the study medication.

Assessment of efficacy and safety

The primary efficacy endpoint was change in ALT level, assessed at multiple time points. Patients were divided into two groups after termination of the study, based on the change in ALT level upon vitamin E treatment. The two groups were designated "responders" and "non-responders". Responders were defined as patients exhibiting a decrease in serum ALT of at least 5% below the baseline value after 12 weeks of treatment. The safety parameters that were assessed included adverse events and laboratory safety tests.

Statistical analyses

The sample size was calculated by comparison of proportion differences between two groups to provide >90% power to detect a 30% difference in ALT level between the two groups using the two-sided Fisher's exact test, with a significance level (alpha) of 0.05 (p1 = 0.01 and p2 = 0.5) [11]. Data from all patients were analyzed by intention-to-treat. One enrolled patient declined to participate before receiving study medication and was excluded from the analysis. Patients who dropped out of the study or who failed to return for follow-up were analyzed based on last observation carried forward. Primary efficacy analyses compared ALT levels at the end of the treatment according to the treatment group. Secondary analyses included baseline and biochemical variables compared between the responder and nonresponder groups. Data were presented as mean $\pm$ standard deviation (SD) for continuous variables and number (%) for categorical variables. Differences in the frequencies of events between two groups were analyzed using Chi-square test or Fisher exact test. Student t-test or Mann-withney test was used to compare continuous variables between two groups. A *p*-value less than 0.05 was considered to be statistically significant.

Results

Patient characteristics

Thirty-seven patients were enrolled in the present study. Nineteen patients were randomly assigned to the vitamin E group, and 18 patients were randomly assigned to the placebo group. Thirty-six patients completed the present study; one patient in the placebo group dropped out after enrollment due to personal reasons and did not receive any study medication (Fig. 1). Baseline demographics and biochemical and disease-related characteristics did not differ between the two treatment groups (Table 1, 2). The mean age of both groups was 50 years, with ranges of 31 to 62 years in the vitamin E group and 31-63 years in the placebo group. Female predominance was present in both groups. Nine patients (25%) were overweight (BMI 23-24.9 kg/m^2), and 14 patients (39%) were obese (BMI $\geq$25 kg/m^2) according to the proposed criteria for Asian populations [15]. Significant co-morbidities were reported in 44.4% of patients: hypertension in 30.6%, dyslipidemia in 11.1% and diabetes mellitus in 5.6%. The most commonly identified route of HCV acquisition was history of blood transfusion (40% of patients), whereas "no identifiable risk factor" was reported in 25% of patients. Three patients (8.3%) had unsuccessful previous treatment with pegylated interferon plus ribavirin. Baseline ALT levels were 105.05 ($\pm$66.925) IU/L and 107.47 ($\pm$71.228) IU/L in the vitamin E and placebo groups, respectively, with no statistically significant difference between the groups (Table 1, 2).

Treatment efficacy

Following 12 weeks of treatment, serum ALT levels were reduced from 105.1 ($\pm$66.9) IU/L to 96.5 ($\pm$88.6) IU/L in the vitamin E group (p = 0.260 by Wilcoxon signed-rank test), while serum ALT levels increased

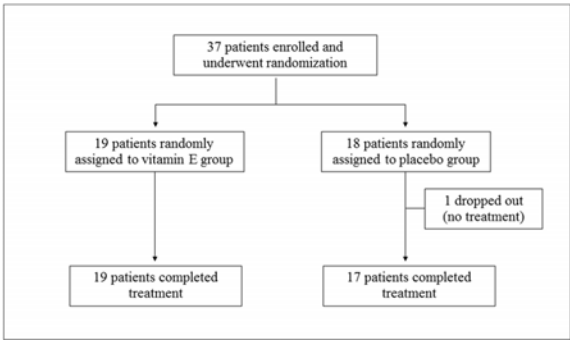

Fig. 1 Patient disposition flow chart.

Table 1. Demographic and disease-related characteristics

Characteristics	Vitamin E (n = 19)	Placebo (n = 17)	Total (n = 36)	*p*-value
Age (year)				0.809[a]
Mean ± SD	48.8±8.3	49.5±8.6	49.2±8.3	
Median (min-max)	50 (31-62)	50 (31-63)	50 (31-63)	
Sex				0.923[b]
Male	7 (36.8)	6 (35.3)	13 (36.1)	
Female	12 (63.2)	11 (64.7)	23 (63.9)	
HCV-RNA, IU/ml	1,540,000±2,215,000	1,180,000±2,068,000	1,370,000±2,122,000	0.605[c]
Log10	5.6±0.8	5.4±0.7	5.5±0.7	0.625[a]
Duration	4.1±6.5	4.4±6.8	4.2±6.6	0.873[a]
Previous treatment failure	2 (10.5)	1 (5.9)	3 (8.3)	0.999[d]
Comorbidities	8 (42.1)	8 (47.1)	16 (44.4)	0.765[b]
Hypertension	5 (26.3)	6 (35.3)	11 (30.6)	0.559[b]
Diabetes mellitus	1 (5.3)	1 (5.9)	2 (5.6)	0.999[d]
Dyslipidemia	2 (10.5)	2 (11.8)	4 (11.1)	0.999[d]
Coronary artery disease	1 (5.3)	1 (5.9)	2 (5.6)	0.999[d]
Asthma	1 (5.3)	1 (5.9)	2 (5.6)	0.999[d]
Mode of transmission				
Blood transfusion	7 (36.8)	7 (41.2)	14 (38.9)	0.790[b]
Tattoo	5 (26.3)	4 (23.5)	9 (25.0)	0.999[d]
IVDU	3 (15.8)	2 (11.8)	5 (13.9)	0.999[d]
Sexual	1 (5.3)	0 (0.0)	1 (2.8)	0.999[d]
Unknown	5 (26.3)	4 (23.5)	9 (25.0)	0.999[d]
Alcohol consumption	4 (21.1)	4 (23.5)	8 (22.2)	0.999[d]
Smoking	5 (26.3)	4 (23.5)	9 (25.0)	0.999[d]
Adequate exercise	13 (68.4)	12 (70.6)	25 (69.4)	0.888[b]

Values are represented as n (%), mean ± SD, [a]*p*-value from independent t-test, [b]*p*-value from Chi-square test, [c]*p*-value from Mann-Whitney U-test, [d]*p*-value from Fisher's exact test

from 107.5 (±71.2) IU/L to 120.4 (±84.6) IU/L in the placebo group (Fig. 2). Eleven of 19 patients in the vitamin E group (57.8%) were responders (ALT levels reduced from 122.6 (±80.1) IU/L to 68.4 (±25.3) IU/L; 55.78% reduction; $p = 0.016$), whereas 5 of 17 patients in the placebo group (29.41%) were responders (Table 3, 4). One patient inthe vitamin E group achieved ALT normalization.

Safety and tolerability

Treatment was well tolerated in both vitamin E and placebo groups. Mild and transient, non-specific adverse events were reported, including fatigue, headache, sleep disturbance, early hunger, weight gain, abdominal pain, myalgia and stress (Table 5). The overall distribution of individual adverse events did not differ significantly across the study groups. No cases of serious adverse events or significant hepatotoxicity requiring reduction or discontinuation of the study medication were reported.

Discussion

In the present study, nearly 50% of chronic hepatitis C patients responded favorably to treatment with high-dose vitamin E (800 IU/day) as indicated by significantly decreased serum ALT levels. The beneficial effect on ALT levels was observed early, after four weeks of vitamin E treatment. Nevertheless, a small number of patients (26%) demonstrated a substantial decrease in ALT (more than 35% from baseline levels), and only one patient achieved complete ALT normalization. These results confirmed the previous findings of Von Herbay et al[11]. Compared withVon Herbay et al[11], the present study hada larger sample size and focusedexclusively on HCV genotype 3, which is most often associated with hepatic steatosis. Because the pathogenesis of liver damage in patients with chronic hepatitis C is partly associated with an increased formation of ROS, which is capable of inducing oxidative damage to DNA and cell membranes[3-7], the authors speculate that the primary

Table 2. Clinical and biochemical characteristics of the vitamin E and placebo groups

	Vitamin E			Placebo		
	Initial	4 weeks	12 weeks	Initial	4 weeks	12 weeks
BW (kg)	61.1±10.7	61.2±10.7	60.5±10.7	61.2±11.3	61.2±10.8	61.1±10.8
BMI	24.2±3.4	24.6±3.6	24.0±3.6	24.0±3.4	24.0±3.3	24.0±3.3
Hb (g/dL)	13.7±1.6		13.8±1.6	13.8±1.4		13.6±1.6
Hct (%)	40.9±4.9		41.3±4.1	40.9±3.6		40.4±4.7
WBC (cell/mm^3)	6,083±1,072		6,741±2,179	6,138±1,261		6,801±1,963
Platelet (cell/mm^3)	188,157±66,400		190,947±63,494	187,529±60,587		179,000±63,496
Albumin (g/dL)	4.3±0.3	4.3±0.4	4.2±0.4	4.3±0.4	4.2±0.4	4.2±0.3
AST (IU/L)	87.5±43.3	82.5±51.3	79.8±60.3	86.8±42.9	94.2±49.9	91.1±46.5
ALT (IU/L)	105.1±66.9	106.2±93.9	96.5±88.6	107.5±71.2	118.7±75.5	120.4±84.6
Chol (mg/dL)	173.1±26.6		172.8±36.5	172.2±32.5		175.8±32.1
TG (mg/dL)	109.3±68.2		94.6±34.5	113.6±69.0		96.0±37.4
HDL (mg/dL)	50.5±15.1		55.4±23.6	51.7±15.8		48.4±12.1
LDL (mg/dL)	107.0±27.1		108.7±33.7	107.9±27.8		109.3±36.2

Values are represented as mean ± SD

BW = body weight; BMI = body mass index; Hb = hemoglobin; Hct = hematocrit; WBC = white blood cell count; AST = aspartate aminotransferase; ALT = alanine aminotrans ferase; Chol = cholesterol; TG = triglyceride; HDL = high-density lipoprotein; LDL = low-density lipoprotein

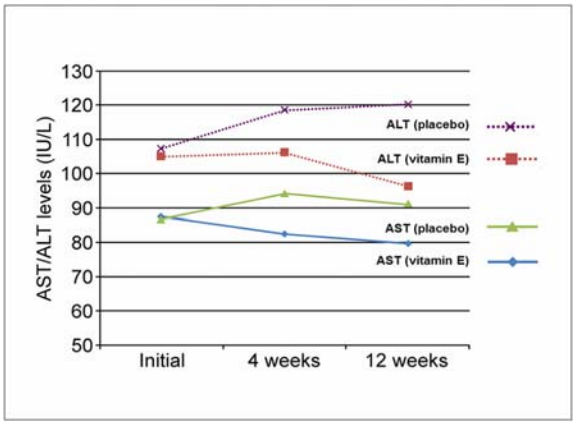

Fig. 2 Serum alanine aminotransferase (ALT) and aspartate aminotransferase levels (AST) compared between the vitamin E and placebo groups.

Table 3. Treatment responses between the vitamin E and placebo groups

	Vitamin E group	Placebo group
Responder* (n, %)	11/19 (57.9)	5/17 (29.4)
Nonresponder (n, %)	8/19 (42.1)	12/17 (70.6)

* Responders were defined by a significant reduction of at least 5% in alanine aminotransferase level from baseline levels after treatment

mechanism by which vitamin E has a beneficial effect on serum ALT levels is through its antioxidant properties.

Vitamin E therapy has been associated with a high rate of overall improvement in NASH in terms of reducing serum ALT levels, hepatic steatosis and lobular inflammation[12]. In Western populations, fatty liver and features of insulin resistance are very common among patients with HCV infection, particularly in those with genotype 3[14]. Thus, NASH has been reported in up to 10% of HCV patients, and it was associated with higher ALT levels and more aggressive liver disease compared with HCV patients without NASH[14,16]. Despite limited data, these findings have been reproduced in Asian populations[17,18]. In the present study, 39% of patients were obese and 36% of patients had other features of insulin resistance (diabetes, hypertension, and dyslipidemia). With the limitation of a small number of patients in our study, we did not find correlations between BMI categories or comorbidities and ALT responses following vitamin E therapy.

Low vitamin E levels have been observed in patients with various etiologies of liver disease, including hemochromatosis, alcohol, Wilson's disease, and chronic hepatitis C[19,20]. The mechanism underlying low vitamin E levels remains unclear. Nevertheless, it is thought to be related to elevated levels of free iron[19,20]. The significance of the role played by ordinary micronutrients in patients with chronic liver disease has not been well characterized.

The primary endpoint in the present study was changes in ALT levels, which we believe to be a clinically important endpoint without requiring liver biopsy. Precedence for this rationale was established by earlier trials of antiviral therapies for chronic hepatitis C, before the advent of qualitative assays for HCV-RNA, which used biochemical response (changes in hepatic transaminase activity) as the primary endpoint of treatment[21-23]. Studies of combining interferon and ribavirin have consistently demonstrated improvement in serum ALT activity, necroinflammatory activity, and even in some measures of hepatic fibrosis, with successful viral eradication[24-28]. Biochemical and histological improvement is also evident in many patients, even when sustained virological response has not been achieved[23-25]. Histological improvement; however, frequently accompanied biochemical improvement in these studies during IFN therapy, and many consider that serum ALT activity may provide an indirect marker to improve disease activity, although this has not been conclusively demonstrated[23].

In conclusion, vitamin E treatment decreases serum ALT levels in patients with CHC genotype 3. Because of its good safety profile, vitamin E may be a worthwhile supportive therapy for patients with CHC, particularly in those who were unable to achieve viral eradication by standard therapy.

Acknowledgement

The authors are thankful to the Gastroenterological Association of Thailand (GAT) and Rajavithi Hospital for providing financial support for this study.

Potential conflicts of interest

None.

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Table 4. Characteristics of patients according to their treatment response

Responders	Vitamin E (n = 11)			Placebo (n = 5)		
	Initial	4 weeks	12 weeks	Initial	4 weeks	12 weeks
BW (kg)	59.9±10.6	59.9±10.2	59.5±9.8	61.8±13.6	61.8±12.6	61.5±12.7
BMI (kg/m^2)	23.6±3.6	23.6±3.6	23.5±3.7	24.7±4.0	24.8±3.9	24.6±4.1
Hb (g/dL)	14.0±1.1	-	13.9±1.1	13.4±2.3		13.0±2.0
Hct (%)	41.2±5.1	-	41.3±2.9	39.5±5.4		39.8±5.2
WBC (cell/mm^3)	6,181±1,002	-	7,101±2,658	6,332±1,353		6,238±1,792
Platelet (cell/mm^3)	181,090±58,289	-	184,909±58,848	196,200±70,414		197,800±83,989
Albumin (g/dL)	4.3±0.3	4.4±0.3	4.2±0.3	4.3±0.3	4.2±0.3	4.2±0.3
AST (IU/L)	101.1±50.7	81.2±55.9	63.2±22.8[a]	75.4±27.6	76.6±30.8	63.2±20.9
ALT (IU/L)	122.6±80.1	107.1±112.2	68.4±25.3[b]	89.2±40.6	92.2±49.3	73.6±30.6
Nonresponders	Vitamin E (n = 8)			Placebo (n = 12)		
	Initial	4 weeks	12 weeks	Initial	4 weeks	12 weeks
BW (kg)	62.8±11.4	63.1±11.8	61.96±12.4	61.0±10.8	60.9±10.6	61.0±10.5
BMI (kg/m^2)	25.0±3.2	25.2±3.5	24.7±3.5	23.7±3.2	23.0±3.2	23.7±3.1
Hb (g/dL)	13.4±2.1	-	13.63±2.20	13.9±1.1		13.9±1.4
Hct (%)	40.50±4.9	-	41.38±5.5	41.5±2.7		40.7±4.7
WBC (cell/mm^3)	5,949±1,219	-	6,245±1,277	6,058±127		7,035±2,058
Platelet (cell/mm^3)	197,875±79,355	-	199,250±72,688	183,916±59,058		171,166±55,422
Albumin (g/dL)	4.2±0.4	4.1±0.5	4.2±0.4	4.3±0.4	4.2±0.4	4.2±0.4
AST (IU/L)	68.9±21.7	84.4±48.0	102.8±87.0	91.5±48.2	101.5±55.4	102.7±49.9[c]
ALT (IU/L)	81.0±35.1	104.9±68.6	135.1±127.8	115.1±81.0	129.7±83.4	139.9±93.0[d]

Values are represented as mean ± SD

[a]$p = 0.010$, [b]$p = 0.016$, [c]$p = 0.0057$, [d]$p = 0.004$. BW = body weight; BMI = body mass index; Hb = hemoglobin; Hct = hematocrit; WBC = white blood cell count; AST = aspartate aminotransferase; ALT = alanine aminotransferase

Table 5. Adverse events

Characteristics	Vitamin E (n = 19)	Placebo (n = 17)	Total (n = 36)
Hypersomnia	1 (5.3)	-	1 (2.8)
Stress	1 (5.3)	-	1 (2.8)
Early hunger	1 (5.3)	-	1 (2.8)
Headache	1 (5.3)	2 (11.8)	3 (8.3)
Fatigue	2 (10.5)	5 (29.4)	7 (19.4)
Weight gain	1 (5.3)	-	1 (2.8)
Insomnia	-	1 (5.9)	1 (2.8)
Abdominal pain	-	1 (5.9)	1 (2.8)
Myalgia	-	3 (17.6)	3 (8.3)

Values are represented as n (%)

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ผลของวิตามินอีในผู้ป่วยโรคตับอักเสบเรื้อรังจากไวรัส ซี ชนิดที่ 3: การวิจัยเชิงทดลองแบบสุ่มและมีกลุ่มควบคุม

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ภูมิหลัง: ไวรัสตับอักเสบซีสามารถทำให้เกิดการอักเสบเรื้อรังและไขมันสะสมในเซลล์ตับส่งผลให้เซลล์ตับถูกทำลายโดยสารอนุมูลอิสระและเกิดพังผืดในตับตามมาโดยพบว่าไวรัสตับอักเสบซี ชนิดที่ 3 มีความสัมพันธ์กับการเกิดภาวะไขมันสะสมในตับได้บ่อยกว่าไวรัสตับอักเสบซี ชนิดอื่น ๆ วิตามินอีมีฤทธิ์ต้านสารอนุมูลอิสระและสามารถลดการเกิดสภาวะเครียดออกซิเดชั่น (oxidative stress) การศึกษาทางคลินิกพบว่าวิตามินอี มีประสิทธิภาพในการลดเอนไซม์ alanine aminotransferase (ALT) และทำให้พยาธิของตับดีขึ้นในผู้ป่วยโรคไขมันเกาะตับ (non-alcoholic steatohepatitis)

วัตถุประสงค์: เพื่อประเมินผลของวิตามินอี ต่อระดับเอนไซม์ ALT ในผู้ป่วยโรคตับอักเสบเรื้อรังจากไวรัสซี ชนิดที่ 3

วัสดุและวิธีการ: เป็นการศึกษาวิจัยแบบ randomized, placebo-controlled, double-blind ในโรงพยาบาลราชวิถี ระหว่างปี พ.ศ. 2553-2554 ทำการศึกษาในผู้ป่วยโรคตับอักเสบเรื้อรังจากไวรัสซี ชนิดที่ 3 ที่ไม่สามารถรักษาหรือไม่ตอบสนองการรักษาโดยยาต้านไวรัสมาตรฐานผู้ป่วยที่มีการลดลงของระดับเอนไซม์ ALT อย่างน้อยร้อยละ 5 หลังจากได้รับการรักษาเป็นเวลา 12 สัปดาห์ถือว่ามีการตอบสนองต่อการรักษา

ผลการศึกษา: ผู้ป่วย 37 รายได้รับการแบ่งเป็นสองกลุ่มโดยการสุ่ม กลุ่มที่ได้รับวิตามินอี 400 ยูนิต รับประทานวันละ 2 ครั้ง จำนวน 19 ราย และกลุ่มที่ได้รับยาหลอกจำนวน 18 ราย ทำการศึกษาทั้งหมดเป็นระยะเวลา 12 สัปดาห์ ผู้ป่วยกลุ่มที่ได้รับวิตามินอี 11 ใน 19 ราย (57.8%) มีการตอบสนองต่อการรักษาเมื่อเปรียบเทียบกับ 5 ใน 17 ราย (29.4%) ในกลุ่มที่ได้รับยาหลอกโดยในกลุ่มผู้ตอบสนองต่อการรักษาพบว่าค่าระดับเอนไซม์ ALT ลดลงชัดเจนมากกว่าในกลุ่มที่ได้รับวิตามินอี (ลดลงจาก 122.6 (±80.1) IU/L เป็น 68.4 (±25.3) IU/L, p = 0.016) เมื่อเปรียบเทียบกับกลุ่มที่ได้รับยาหลอก (ลดลงจาก 89.2 (±40.6) IU/L เหลือ 73.6 (±30.6) IU/L, p>0.05) พบว่าการรักษาโดยการวิตามินอีมีความปลอดภัยดีไม่ต่างจากยาหลอกและไม่มีผลข้างเคียงที่รุนแรงระหว่างการศึกษา

สรุป: การรักษาด้วยวิตามินอีสามารถลดระดับเอนไซม์ ALT ในผู้ป่วยโรคตับอักเสบเรื้อรังจากไวรัสซี ชนิดที่ 3 เนื่องจากวิตามินอีมีความปลอดภัยสูง ดังนั้นจึงอาจพิจารณาใช้เสริมในการรักษาผู้ป่วยตับอักเสบเรื้อรังจากไวรัสซี โดยเฉพาะอย่างยิ่งในผู้ป่วยซึ่งไม่สามารถรักษาให้หายขาดได้จากการยารักษาตามวิธีมาตรฐาน