Table 1: Clinical trials of Vitamin E during cancer treatment

Source: Luc Geeraert, CAM-Cancer Consortium. Vitamin E during cancer [online document].. September 2015.

First author year (ref)	Study design	Participants (number, diagnosis)	Interventions (experimental treatments, control)	Main outcome measures	Main results	Comments
Cancer treatment						
Blanke 2001 (16)	uncontrolled	12 patients with incurable malignancies	oral alpha-tocopherol (3200 IU daily) as a monotherapy for 14 days, then combined with 5-fluorouracil + leucovorin for 5 days; schedule repeated 4 weeks later and then each 5 weeks indefinitely	tumour evaluation and response assessment according to standard criteria	no anticancer response; maximal therapeutic doses of alpha-tocopherol can be combined with 5-fluorouracil + leucovorin without increasing side effects of chemotherapy	no control group, comparison with historical data, small trial
Nesaretnam 2010 (17)	double-blind, placebo-controlled	240 women with early breast cancer	oral palm oil tocotrienol-rich fraction (200 mg per day) plus oral tamoxifen (20 mg per day), or placebo plus tamoxifen, for 5 years	clinical evaluations, routine blood tests for hematology, blood chemistry assessment	adjuvant tocotrienol did not decrease breast-cancer-specific mortality or breast cancer recurrence	non-randomized
Radiation-related adverse events						
Bairati 2005a (18), Bairati 2005b (19), Bairati 2006 (20)	randomized, double-blind, placebo-controlled	284 head and neck cancer patients treated with radiotherapy	oral all-rac-alpha-tocopherol (400 IU daily) or placebo	radiation-related adverse events and quality of life	oral all-rac-alpha-tocopherol did not protect against radiation-related adverse events, had no effect on quality of life, increased risk of second primary cancers, and increased all-cause mortality during follow-up period	originally, 540 patients were enrolled to study supplementation with all-rac-alpha-tocopherol and beta-carotene combination, however beta-carotene supplementation was discontinued for ethical concerns
Chitra 2011 (21)	randomized, controlled	60 patients with oral cancer treated with radiotherapy	oral alpha-tocopherol (400 IU daily) or nothing	erythrocyte membrane adenosine triphosphatase activity	alpha-tocopherol may protect membranes from radiation damage	no placebo

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Galuppi 2011 (22)	controlled	62 endometrial and cervical cancer patients undergoing radiotherapy for prevention of acute vaginal complications	alpha-tocopherol acetate administered by vaginal suppository (500 mg daily) or nothing	assessment of acute toxicity of vaginal mucosa	alpha-tocopherol reduced vaginal toxicity, pain, and inflammation, no difference in vaginal secretion and fibrosis, increase of acanthosis.	no placebo

Oral mucositis induced by chemotherapy or radiotherapy						
Wadleigh 1992 (23)	randomized, double-blind, placebo-controlled	18 cancer patients treated with chemotherapy	topical vitamin E oil (400 mg twice daily, unspecified chemical form) or placebo oil	evaluation of oral lesions	vitamin E sped up healing of oral lesion	small trial
Lopez 1994 (24)	randomized, placebo-controlled	19 patients with hematological malignancies treated with chemotherapy	topical all-rac-alpha-tocopherol (2 ml pure daily) or placebo oil	evaluation of oral lesions	all-rac-alpha-tocopherol decreased duration and severity of mucositis especially during induction therapy	small trial
Ferreira 2004 (25)	randomized, double-blind, placebo-controlled	54 head and neck cancer patients treated with radiotherapy	topical all-rac-alpha-tocopherol acetate (400 mg dissolved in oil twice daily) or placebo oil	evaluation of oral lesions	all-rac-alpha-tocopherol led to lower frequencies of symptomatic radiation-induced mucositis	
El-Housseiny 2007 (26)	randomized	80 children with cancer treated with chemotherapy	topical vitamin E or capsule of vitamin E (100 mg twice daily, unspecified chemical form)	evaluation of oral lesions	topical (and not oral) vitamin E effective treatment of oral mucositis	no placebo
Khurana 2013 (27)	randomized, single-blind, placebo-controlled	72 children with hematological malignancies treated with chemotherapy	topical tocopherol acetate (200 mg three times daily), pycnogenol, or placebo	evaluation of oral lesions, functional assessment and subjective assessment by patient	tocopherol acetate effective treatment of oral mucositis	
Sung 2007 (28)	series of N-of-1, double-blind, randomized placebo-controlled trials	16 children (at least 6 years old) with cancer treated with doxorubicin-containing regimens	topical all-rac-alpha-tocopherol acetate (800 mg daily) or placebo oil	evaluation of oral lesions	no reduction of chemotherapy-induced oral mucositis by all-rac-alpha-tocopherol	

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Radiation-induced cutaneous damage						
Delanian 2003 (29)	randomized, double-blind, placebo-controlled	24 women with 29 radiation-induced fibrosis areas (skin and underlying tissues)	oral alpha-tocopherol (1000 IU daily) alone or combined with pentoxifylline, or placebo	relative regression of measurable radiation-induced fibrosis surface	alpha-tocopherol alone ineffective while combination with pentoxifylline reduced superficial radiation-induced fibrosis	
Ravo 2011 (30)	controlled	100 breast cancer patients treated with radiotherapy	topical vitamin E (unspecified chemical form), or one of 4 other topical treatments	skin examination	vitamin E did not prevent skin toxicity	no placebo
Radiation-induced damage to salivary glands						
Chitra 2008 (31)	randomized, controlled	89 oral cavity cancer patients treated with radiotherapy	oral alpha-tocopherol (400 IU daily) or nothing	evaluation of salivary gland function	alpha-tocopherol improved salivary flow rate and maintained salivary parameters	no placebo
Fallahi 2013 (32)	randomized, double-blind, placebo-controlled	36 patients with thyroid cancer treated with radiotherapy	oral vitamin E (800 IU daily, unspecified chemical form) or placebo	semi-quantitative evaluation of salivary gland function	vitamin E protected salivary glands against radiation-induced dysfunctions	

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Chemotherapy-induced neurotoxicity						
Pace 2003 (33)	randomized, controlled	47 cancer patients treated with cisplatin	oral all-rac-alpha-tocopherol acetate (300 mg daily) or nothing	incidence and severity of neurotoxicity	all-rac-alpha-tocopherol acetate decreased incidence and severity of peripheral neurotoxicity	no placebo
Argyriou 2005 (34)	randomized, controlled	31 cancer patients treated with cisplatin and/or paclitaxel	oral all-rac-alpha-tocopherol acetate (300 mg twice daily) or nothing	clinical evaluation of neuropathy and neurophysiologic examination	all-rac-alpha-tocopherol acetate decreased incidence and severity of peripheral neurotoxicity	no placebo
Argyriou 2006a (35)	randomized, controlled	30 cancer patients treated with cisplatin	oral all-rac-alpha-tocopherol acetate (300 mg twice daily) or nothing	clinical evaluation of neuropathy and neurophysiologic examination	all-rac-alpha-tocopherol acetate decreased incidence and severity of peripheral neurotoxicity	no placebo
Argyriou 2006b (36)	randomized, controlled	32 cancer patients treated with paclitaxel	oral all-rac-alpha-tocopherol acetate (300 mg twice daily) or nothing	clinical evaluation of neuropathy and neurophysiologic examination	all-rac-alpha-tocopherol acetate decreased incidence and severity of peripheral neurotoxicity	no placebo
Pace 2010 (37)	randomized, double-blind, placebo-controlled	108 cancer patients treated with cisplatin	oral alpha-tocopherol (400 mg daily) or placebo	clinical evaluation of neuropathy and neurophysiologic examination	alpha-tocopherol decreased incidence and severity of peripheral neurotoxicity	
Kottschade 2011 (38)	randomized, double-blind, placebo-controlled	207 cancer patients treated with taxanes or platinum compounds	oral all-rac-alpha-tocopherol (300 mg twice daily) or placebo	evaluation of neuropathy	all-rac-alpha-tocopherol did not reduce incidence of sensory neuropathy	
de Afonseca 2013 (39)	randomized, double-blind, placebo-controlled	34 patients with colorectal and gastric cancer treated with oxaliplatin-based regimens	oral vitamin E (400 mg daily) or placebo	evaluation of peripheral neuropathy	vitamin E did not decrease incidence acute oxaliplatin-induced peripheral neuropathy	

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Cardiotoxicity caused by doxorubicin						
Whittaker 1984 (40)	randomized, controlled	63 patients with acute myeloid leukemia treated with doxorubicin	oral vitamin E (200 mg thrice daily, unspecified chemical form) or digoxin or nothing	measurement of systolic time intervals	vitamin E had no effect on doxorubicin-induced cardiac toxicity	no placebo
Legha 1982 (41)	uncontrolled	21 patients with metastatic breast cancer treated with doxorubicin	oral alpha-tocopherol (2 g/m^2 daily)	endomyocardial biopsies	alpha-tocopherol did not substantially protect against doxorubicin-induced cardiac toxicity	no placebo, small trial
Hand-foot skin syndrome related to sorafenib or capecitabine therapy						
Kara 2006 (42)	uncontrolled	5 patients with metastatic breast cancer treated with docetaxel and capecitabine	oral vitamin E (300 mg daily, unspecified chemical form)	evaluation of skin lesions	vitamin E caused resolution of hand-foot skin syndrome	no control group, very small trial
Yamamoto 2010 (43)	uncontrolled, retrospective	32 breast cancer patients treated with capecitabine	oral vitamin E (100-400 mg daily, unspecified chemical form)	evaluation of pain and skin lesions	vitamin E had beneficial effect to resolution of hand-foot skin syndrome	no control group
Bozkurt Duman 2011 (44)	uncontrolled	14 patients with hepatocellular carcinoma treated with sorafenib	oral vitamin E (300 mg daily, unspecified chemical form)	evaluation of skin lesions	vitamin E caused resolution of hand-foot skin syndrome	no control group, small trial
Doxorubicin-induced alopecia						
Wood 1985 (45)	uncontrolled	16 patients with different types of solid tumours treated with doxorubicin	oral all-rac-alpha-tocopherol acetate (1600 IU daily)	evaluation of hair loss	all-rac-alpha-tocopherol acetate prevented doxorubicin-induced alopecia	no control group, small trial
Martin-Jimenez 1986 (46)	controlled	37 breast cancer patients treated with chemotherapy with doxorubicin, fluorouracil, and cyclophosphamide	oral all-rac-alpha-tocopherol acetate (1600 IU daily) or nothing	evaluation of hair loss	all-rac-alpha-tocopherol acetate did not prevent doxorubicin-induced alopecia	no placebo
Perez 1986 (47)	uncontrolled	20 patients with different types of solid tumours treated with doxorubicin	oral alpha-tocopherol (1600 IU daily)	evaluation of hair loss	alpha-tocopherol did not prevent doxorubicin-induced alopecia	no control group, small trial