

CURRENT TOPICS IN NUTRACEUTICAL RESEARCH

Volume 11

Number 4

November 2013

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113-128 THE ANTI-HYPERTENSIVE ACTIONS OF COCOA POLYPHENOLS – A REVIEW
D. Field and G. Newton

ABSTRACT: *Elevated blood pressure is a significant risk factor in cardiovascular disease, which contributes to cardiovascular events and related mortality. Cocoa beans are rich in phenolic compounds, specifically flavanols, which act to up-regulate nitric oxide through a multitude of pathways, promoting vasodilation in the body and exerting an antihypertensive effect, subsequently improving endothelial function. Clinical and experimental research has evaluated cocoa flavanol consumption and its effects on endothelial nitric oxide synthase modulation, antioxidant function, endothelin-1 inhibition, and angiotensin converting enzyme inhibition. Thus, cocoa polyphenols have been studied in the lowering of blood pressure and associated CVD-related mortality. This paper will explore the nature of polyphenols derived from cocoa, their proposed mechanisms of action, bioavailability, and efficacy in improving systolic and diastolic blood pressure in hypertensive and healthy individuals. Primary, review, and meta-analysis literature will be analyzed from animal and human trials to determine the extent of cocoa-polyphenols' effects on blood pressure, effective dosage and recommendations in consumption, as well as directions for future research.*

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129-136 THE POTENTIAL WAYS FOR PREVENTING POSTPRANDIAL INFLAMMATION
– A REVIEW
Chih-Hui Chiu, Tzai-Li Li, Chen-Kang Chang and Ching-Lin Wu

ABSTRACT: *The approaches to alleviate low-grade systemic inflammation during postprandial period are still controversial at present. The aims of this article were to review the possible negative effects of postprandial inflammation and to provide potential way to prevent the risks to health during postprandial period through understanding the possible mechanism. Postprandial inflammation may lead to chronic low-grade systemic inflammation. Previous evidence showed that consumption of saturated fats, the elevation of circulating free fatty acids and high levels of blood glucose may lead to increased postprandial inflammation via activated NF- κ B pathway, whereas, dietary with low GI, low saturated fats, and fiber-rich appeared to attenuate the postprandial inflammatory responses via down-regulating the NF- κ B pathway. Furthermore, it has been suggested that weight loss may successfully lead to a significant reduction in postprandial inflammatory responses. Many studies indicated that exercise served as anti-inflammatory, however no sufficient and convincing evidence proves that exercise alleviated the subsequent postprandial inflammatory responses to date. Therefore, more studies are warranted to investigate the possible mechanisms of how different exercises and diet/meal/nutrients affect low-grade systemic inflammation.*

137-144 **CYTOTOXIC EFFECT OF PUMPKIN (*CURCUBITA PEPO*) SEED EXTRACTS IN LNCaP PROSTATE CANCER CELLS IS MEDIATED THROUGH APOPTOSIS**

A. Rathinavelu, A. Levy, D. Sivanesan, R. Murugan, J. Jornadal, Y. Quinonez, M. Jaffe and M. Gossell-Williams

ABSTRACT: *The cytotoxic effects and related mechanisms of pumpkin (*Cucurbita pepo*) seed ethanolic (PS-ET) and aqueous (PS-AQ) extracts were evaluated in LNCaP prostate cancer cells. LNCaP cells were exposed to extracts for 24hr. The viability of LNCaP cells was significantly decreased following 24 hr treatment with both PS-AQ (IC₅₀= 49 µg/ml) and PS-ET (IC₅₀= 55 µg/ml) extracts. The reactive oxygen species levels were also significantly increased (4.1 ± 0.2 and 3 ± 0.3 fold) and mitochondrial membrane potential was reduced with both PS-AQ and PS-ET extracts respectively. Both extracts induced DNA fragmentation and PolyADP-ribose polymerase (PARP) cleavage. Additionally PS-ET produced a 5 (± 0.2) and 3.5 (± 0.4) fold increase in caspase 3 and 9 activities respectively, while PS-AQ produced a 7 (± 0.4) and 3 (± 0.9) fold increase in caspase 3 and 9 activities respectively. Our results confirm that the cytotoxic activity of both PS extracts is mediated through oxidative stress and mitochondrial depolarization. Further, the cleavage of PARP, caspase activation and DNA fragmentation confirms the induction of apoptosis as the major cytotoxic modality for the extracts. These findings could hold positive implications for potential pumpkin seed extract intervention in prostate cancer therapy.*

145-150 **EQUOL (4',7-ISOFILAVANDIOL) INHIBITS ODORANT-INDUCED cAMP AND CALCIUM LEVELS IN AGS CELLS EXPRESSING THE OLFATORY RECEPTOR**

Sung-Hee Kim, Yeo Cho Yoon, Jin Il Kim, Jin-Taek Hwang, Mi Jung Sung, Myung-Sunny Kim, Haeng Jeon Hur, Mee-Ra Rhyu, Man-Seong Park and Jae-Ho Park (S-H K and YCY contributed equally to this manuscript)

ABSTRACT: *Equol is a nonsteroidal estrogen metabolized from the soy isoflavone daidzein by intestinal bacteria. Although its clinical benefits remain unclear, many reports have demonstrated that equol plays various biological roles in cancer, osteoporosis, and cardiovascular disease. Contrary to reports in other systems, the function of equol in the olfactory system has not been well understood. In the olfactory system, various odorants can bind to their receptors on olfactory sensory neurons and subsequently activate adenylyl cyclase (AC). Increased cAMP levels via the activated AC modulate Ca²⁺ influx and lead to altered membrane potential. This process results in transmission of electric signals to the brain. Because cAMP signal transduction and Ca²⁺ levels play crucial roles in the olfactory system, we investigated the effects of equol on the cAMP pathway and Ca²⁺ influx after stimulation by the odorant eugenol in gastric adenocarcinoma cells. Our results reveal that the upregulated cAMP level by eugenol was significantly decreased by equol treatment. Phosphorylation of PKA and CREB, downstream targets of cAMP, was also reduced. Furthermore, the odorant-induced Ca²⁺ levels were decreased in the presence of equol. Taken together, these data suggest that equol inhibits the odorant-induced signaling pathway through modulation of PKA/CREB signaling transduction.*

151-158 EFFECT OF *WITHANIA SOMNIFERA* EXTRACT ON MENTAL STRESS INDUCED CHANGES IN HEMODYNAMIC PROPERTIES AND ARTERIAL WAVE REFLECTIONS IN HEALTHY SUBJECTS

Usharani Pingali, Raveendranadh Pilli and Nishat Fatima

ABSTRACT: *Mental stress is known to contribute to the risk for hypertension and coronary atherosclerosis. Withania somnifera is well known for its anti-stress and antioxidant activity. The present study was done to assess the effect of Withania somnifera extract on acute mental stress induced changes in hemodynamics and arterial wave reflection properties in human participants. In this double-blind, placebo-controlled, randomized, crossover study, 20 healthy participants received 500 mg twice daily of an encapsulated dried aqueous extract of roots and leaves of Withania somnifera or matching placebo for 14 days with a wash out period of 14 days. Blood pressure and central arterial wave reflections were measured noninvasively using Sphygmocor before and after a standardized mental stress test. The results demonstrated an acute effect of mental stress on blood pressure and arterial wave reflections. Withania somnifera extract produced a statistically significant decrease in aortic pressure, augmentation index, radial and aortic SBP, radial and aortic DBP and significant increase in the subendocardial viability ratio (SEVR) compared to baseline and placebo. A significant decrease in hs-CRP, MDA, serum cortisol levels is seen with Withania somnifera extract treatment compared to baseline and placebo. These results suggest that beneficial properties of Withania somnifera extract can mitigate the effects of stress and deserves further investigation in patients with associated diseases.*

159-166 CARDIOVASCULAR BENEFITS OF ORAL ANTIOXIDANT MULTIVITAMIN SUPPLEMENTS IN YOUNG ADULTS WITH LOW BODY MASS INDEX

Hsien-Tsai Wu, Cyuan-Cin Liu, Ding-Yuan Chen, Jyun-Hao Dong, Cheuk-Kwan Sun and Jian-Jung Chen

ABSTRACT: *The objective of this study was to determine the correlation between carotenoid content variation and vascular health after providing young adults with compound nutritional supplements. The young adults were divided into two groups: Group 1 comprised participants whose body mass index (BMI) ≤ 25 ($n = 10$), and Group 2 comprised participants whose BMI > 25 ($n = 8$). A non-invasive Biophotonic Scanner was used to measure the participants' skin carotenoid count (SCC) values, and other instruments were used to measure their pulse wave velocity (PWV_{foot}) and dilatation index (DI) as indicators of vascular health. Part A study required the participants to maintain their original eating habits for 3 months. The resulting SCC, PWV_{foot}, and DI values of the two groups exhibited no significant statistical differences. In Part B study, the participants consumed a fixed amount of compound nutritional supplements daily to increase carotenoids. After 1 month, the SCC and DI values of Group 1 showed a significant increase, and the PWV_{foot} values exhibited statistical differences. In conclusion, when young adults follow their original eating habits and lifestyle, their SCC counts do not vary significantly and vascular health does not improve. Moreover, the SCC count in young adults with a BMI < 25 can be increased through compound nutritional supplement intake, thus improving vascular health.*