Methods: Serum 25(OH)D concentrations were measured in the same participants at 14 and 17 years (n = 1,045 at both time points). The percentage of adolescents with serum 25(OH)D concentrations < 50, 50-74.9 and ≥ 75 nmol/L was reported year-round and by month of blood collection. We examined predictors of serum 25(OH)D concentrations using a general linear mixed model (n = 919 at 14 years; n = 570 at 17 years).
Results: At 14 years, 31% of adolescents had serum 25(OH)D concentrations between 50-74.9 nmol/L and a further 4% had concentrations <50 nmol/L. At 17 years, 40% of adolescents had serum 25(OH)D concentrations between 50-74.9 nmol/L and 12% had concentrations <50 nmol/L. Caucasian ethnicity, being sampled at the end of summer, exercising more, having a lower BMI, a higher calcium intake and a higher family income were significantly associated with higher serum 25(OH)D concentrations.
Conclusions: The proportion of adolescents with serum 25(OH)D concentrations <50 nmol/L was low in this Western Australian cohort. There is a need for international consensus on defining adequate vitamin D status in order to determine whether strategies to improve vitamin D status in adolescents are warranted.
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PLASMA CAROTENOID LEVELS AS BIOMARKERS OF DIETARY CAROTENOID CONSUMPTION: A SYSTEMATIC REVIEW OF THE VALIDATION STUDIES

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Background/Aims: Previous research has demonstrated that plasma carotenoids are a reliable biomarker of usual fruit and vegetable intake. This review aims to synthesize (i) the mean dietary intake, (ii) the plasma concentrations of carotenoids reported from validation studies, and (iii) compare the strength of the relationship between the two, measured using different dietary assessment methods.
Methods: Six databases were used to locate studies that included: adult populations, assessment of dietary intake, measurement of plasma carotenoids and reported the comparison between the two measures.
Results: One hundred and forty two studies were included. The most common reported dietary carotenoid and plasma carotenoid was lycopene: weighted dietary mean intake (4,555.4 μg/day), and plasma concentration 0.62 μmol/L (95%CI: 0.61, 0.63, n = 56 studies). The strongest weighted correlation between the two measures was found for cryptoxanthin (r = 0.38, 95%CI: 0.35, 0.42) followed by α-carotene (r = 0.34, 95%CI: 0.31, 0.36).
Conclusions: This review synthesizes reference ranges for diet and plasma carotenoid concentrations and their expected associations based on validation studies conducted to date which provides a benchmark for future validation studies.
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DETERMINATION OF SIGNAL MOLECULES THAT CONTRIBUTE TO THE ANTIMESOTHELIOMA EFFECT OF A VITAMIN E ANALOGUE

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Background/Aims: Malignant mesothelioma (MM) is commonly caused by asbestos and is resistant to currently used anticancer agents. Tocotrienol (T3), a member of the vitamin E family, is known to have a powerful anticancer effect. In order to reinforce the activity, we synthesized an ether derivative of T3, 6-*O*-carboxypropyl-α-tocotrienol (T3E). In this study, we evaluated signal molecules responsible for the antimesothelioma effect of T3E by the comprehensive analysis of gene expression.
Methods: A human MM cell line (H2452) was cultured under hypoxia. Total RNA of H2452 was extracted after control, T3 and T3E treatment. Microarray was performed using the RNA, and data analysed by cascade evaluation on gene expression. From the cascade analysis, candidates relating to the antimesothelioma effect of T3E were determined.
Results: Forty nine proteins were detected as possible signal molecules contributing to the antimesothelioma effect of T3E From the proteins, interleukin-4 receptor (IL-4R) was determined as a signal molecule concerned with control of cell proliferation. Results of conventional pathway analysis showed suppression of IL-4 signalling by down-regulation of IL-4R. Furthermore, the pathway analysis showed activation of IL-1 and IL-6 signalling was also affected. These results indicate that IL-4 suppression antagonized IL-1 and IL-6-mediated signal activation.
Conclusions: This study suggests that IL-4 signalling, which has few reports on survival of malignant tumours, is important to the survival of MM, and that T3E may be an effective antimesothelioma agent due to its inhibition of IL-4 signalling.
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IN VITRO ANTI-PLATELET AND ANTIOXIDANT EFFECT OF *TASMANNIA LANCEOLATA* (NATIVE PEPPERBERRY)

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Background/Aims: *Tasmannia lanceolata* (TL) was first used as a food flavouring by Aborigines and early settlers. Recent studies have reported TL to have considerable antioxidant content. This study aimed to investigate the *in vitro* antiplatelet and antioxidant activity of extract derived from processed TL leaf (marc) on human blood components.
Methods: The *in vitro* effect of TL extract (0.01-0.1 mg/mL) on ADP-induced (2.5 μM) platelet aggregation in platelet rich plasma and copper-induced (100 μM) serum oxidation over 360 mins was measured in samples collected from 6 to 9 apparently healthy individuals. Results were compared between blank (no added TL extract) and different TL extract concentrations using mixed effects repeated measures analysis (STATA v13).
Results: Reductions in maximum platelet aggregation and increases in serum lipid oxidation lag times occurred with increasing concentrations of TL extract. Maximum platelet aggregation was reduced by 16% and 49% with the lowest (0.01 mg/mL) and highest (0.1 mg/mL) TL extract concentration respectively, compared with no added TL extract (p < 0.05). Maximum aggregation was reduced by 50% at a TL extract concentration between 0.03-0.06 mg/mL. Serum oxidation lag time was increased by 4 mins at the lowest TL concentration and by 159 mins (p < 0.001) at the highest TL concentration compared to no added TL extract. A 50% increase in lag time was observed at concentrations between 0.025 - 0.05 mg/mL.
Conclusions: This study demonstrated that *in vitro* platelet aggregation and oxidation of serum lipids were reduced by the TL marc extract in a concentration dependent manner.
Funding source(s): N/A.

VITAMIN D STATUS, DYSLIPEDEMIA AND MARKERS OF ENDOTHELIAL ACTIVATION IN OLDER ADULTS

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Background/Aims: There is increasing interest in the extra-skeletal effects of vitamin D on chronic diseases including CVD. The objective of this study was to determine whether circulating lipids, systemic inflammation and biomarkers of endothelial cell activation varied across vitamin D status of older Australians.
Methods: One hundred and one participants were proportionately sampled across tertiles of 25-hydroxy-vitamin D_3 from a larger cohort of free living older adults. Blood samples after an overnight fast were assayed for parathyroid hormone (PTH), insulin, TAG, total cholesterol (TC) and lipid fractions. Markers of systemic inflammation and endothelial activation included hsCRP, TNF-α, hepatocyte growth factor (HGF), P-selectin and