P87

Lycopene enrichment of cultured epithelial airway cells
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Background - Lycopene is a fat soluble carotenoid, therefore must to be solubilised in water based media in cell culture experiments for in vitro studies. The solvent or the carriers must be non-toxic and deliver lycopene efficiently into the cultured cells. In vitro enrichment of airway epithelial cells with lycopene is important for examination of the mechanisms by which dietary lycopene supplementation may be used for prevention and/or treatment of airway disease.

Objective - The aim of this study was to compare two commonly used lycopene enrichment methods in cell culture experiments namely tetrahydrofuran (THF), and lycopene liposomes.

Design - Confluent airway epithelial cells (Calu-3) were incubated (for 24 h) with different concentrations of lycopene dissolved in THF, and different concentrations of lycopene carried by liposomes. Cells were visually inspected and both the mediums and the cells were collected to analyse interleukin-6 (IL-6), lactate dehydrogenase (LDH), and lycopene concentrations.

Outcomes – Airway epithelial cells incubated with all concentrations of lycopene carried by liposome underwent cytolysis. Cells incubated with low concentrations of lycopene/THF (2.5 µg lycopene/mL, dissolved in 0.5% THF v/v, and 5 µg lycopene/mL, dissolved in 1% THF v/v) were viable. Furthermore, intracellular lycopene levels increased in a dose-dependent manner after incubation. Cells incubated with higher levels of lycopene/THF (10µg lycopene/mL, dissolved in 2% THF v/v, and 25 µg lycopene/mL, dissolved in 5% THF v/v) underwent cytolysis, with cell necrosis, release of LDH and increased IL-6 release.

Conclusion - Lycopene liposome is not a suitable carrier of lycopene into the Calu-3 cells possibly due to the toxic effect of sodium taurocholate (one of the liposome’s components). However, enriching airway epithelial cells with lycopene dissolved in low concentration of THF for 24 h is a safe method.

P88

The prediction of body fat using BIA in people taking antipsychotic medication
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Background – People with serious and persistent mental illness, particularly those with schizophrenia tend to have higher obesity rates than the general population. Antipsychotic medications are commonly used as an integral part of therapeutic treatment, and are known to induce clinically significant amounts of weight.

Objectives – The purpose of this study was to compare estimates of body fat derived from bioelectric impedance analysis (BIA) with body fat determined using the isotope dilution technique of deuterium dilution

Design – Forty-three people (31 males, 12 females) with psychotic illnesses, predominantly schizophrenia who had been taking atypical antipsychotic medications for more than four months, were recruited to participate in this study. A comparison between percentage body fat (%BF) measured using deuterium dilution and that predicted using the direct output of the single frequency BIA (Imp DF50, Impedimed) was made. Further comparisons were made using additional BIA equations – those of Lukaski et al (1), Kyle et al (2) and Sun et al (3). Statistical analysis included paired t tests and the limits of agreement (LoA) method for determining agreement between two measures.

Outcomes – The mean ± SD for age, weight and %BF was 34 ± 10yrs, 94.4 ± 19.7 kg, 32.4 ± 8.0% for the males and 38 ± 10yrs, 93.5 ± 28.7 kg, 42.3 ± 9.2% for the females. Paired t tests revealed that the 4 predictions of %BF were significantly different from %BF measured using deuterium dilution in the males, whereas the prediction of %BF was significantly different in the females only when using the equations of Kyle et al., (2) and Sun et al., (3). The best prediction of % was made using the Lukaski et al., (1) equations. They had the lowest bias and narrowest LoA – 1.3 ± 3.5% and -5.6 to 8.1% respectively in males and 0.3 ± 2.8% and -5.2 to 5.8% respectively in females.

Conclusions – In males and females taking atypical antipsychotic medication, the equation of Lukaski et al., (1) proved to be the most suitable to convert BIA data an estimate of percentage body fat.

References