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P73

Does the inclusion of moderate amounts of red meat in the diet of exercising older women impact on faecal markers of bowel health, including faecal lactoferrin?

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Background – High intakes of red meat may be associated with increased risk of colorectal cancer (CRC), however, to determine CRC risk, it is important to assess faecal changes related to protein and carbohydrate metabolism.

Objective - To determine the influence of three weekly meals rich in red meat as opposed to a carbohydrate control diet on faecal markers which are involved in the aetiology of CRC.

Design – Twenty post-menopausal women (aged 60-75) undertook, 3 times a week for 12 weeks, a 30 minute exercise session followed immediately by a cooked meal that was high in lean red meat, low in carbohydrate (n= 10) or low in lean red meat, high in carbohydrate (n=10). Dietary fibre intake and macronutrients were kept constant. At the beginning and end of the study, three-day faecal samples were collected and by-products of protein fermentation and carbohydrate metabolism, undigested fibre residues, and faecal output and colonic bacterial microbiota changes measured.

Outcomes – No significant differences were observed in subjects on either diet when comparing faecal output, faecal pH, other faecal markers, nor faecal lactoferrin. There was a trend observed in changes in the population of colonic microbiota using FISH analysis. Bacteroides spp. and Prevotella spp. appeared to decrease in women consuming a high red meat diet compared with an increase in women consuming a high carbohydrate diet.

Conclusions – In this pilot study the trend in colonic microbiota change is interesting and suggests that dietary influence of colonic microbiota, especially changes in Bacteroidetes, may be indicative of risk of gut damage and disease compared to other faecal markers.

P74

Anti-inflammatory effects of lycopene enrichment on the infected cultured airway epithelial cells

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Background – Rhinovirus (RV) is known to trigger acute asthma. The bronchial epithelial cell is the site of RV infection and is known to lead to the release of pro-inflammatory mediators. Lycopene (an antioxidant) supplementation has been shown to reduce inflammation in asthma patients.

Objective – The aim of this study was to determine the effects of lycopene supplementation on the inflammatory response of airway epithelial cells infected by RV and treated with lipopolysaccharide (LPS).

Design – Confluent airway epithelial cells (Calu-3 cells, passages 28-30) were incubated with lycopene for 24 h, and then infected for 48 h with RV-43, RV-1B or treated with LPS 10 ng/ml. Lycopene (2.5 µg/mL) was delivered to the cells by dissolving in tetrahydrofuran (THF) as a co-solvent. THF alone and UV inactivated RV were used as negative controls. Release of interleukin-6 (IL-6), IL-8, and interferon-gamma induced protein-10 (IP-10) by epithelial cells was measured by ELISA. Gene expression of mentioned cytokines was measured by real time polymerase chain reaction (RT-PCR), after RNA extraction and reverse transcription to cDNA.

Outcomes – Pre-treatment with lycopene resulted in a 24% reduction in IL-6 after RV-1B infection (P=0.026), 9% reduction in IL-8 after LPS exposure (P=0.01), and 31% reduction in IP-10 after RV-43 infection (P=0.0001). A similar reduction was seen in mRNA induction with lycopene supplementation.

Conclusions – Pre-treatment of airway epithelial cells with lycopene moderately reduces inflammation following infection with rhinovirus 43, rhinovirus 1B, and LPS infection. This suggests a potential role for lycopene in suppressing airway inflammation that results from RV infection in acute asthma.