proceedings

Abstract

Prevalence of Gene Variants Associated with Poor Absorption or Negative Interactions with Key Anti-Inflammatory Nutrients in a New Zealand Population †

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Background: New Zealand (NZ) has high rates of Crohn's disease (CD) at 26/10^5. Having gene variants associated with low levels of *betacarotene,* vitamin D and Omega-3 polyunsaturated fatty acids can impede the immune response. Not known was the prevalence of these variants in the CD population in NZ.

Methods: We determined the prevalence of these gene variants in NZ adults in two matched groups, one with CD (n = 416) and a control group of healthy adults (n = 649) selected from adult subjects in the 'Genes and Diet in Inflammatory Bowel Disease Study' of Nutrigenomics NZ. The selected SNPs included those associated with genes with betacarotene absorption *BCMO1*-Betacarotene 15,15′-monooxygenase-1, (rs12934922, rs7501331); vitamin D concentrations in the genes *GC*-Group-specific component (rs2282679, rs4588, rs1155563), the Cytochrome P450 family: *CYP24A1*-(rs1699913), *CYP2R1* (rs10741657), and *DHCR7*/*NADSYN1* 7-dehydrocholesterol reductase (rs3829251,rs12785878); with fatty acid desaturases genes which influence omega-three and-six fatty acid metabolism: *FADS1*, *FADS2* (rs174556, rs174570, rs2072114, rs174583 & rs174589); with the Peroxisome proliferator-activated- receptor genes relating to: cholesterol levels *PPARA* (rs4253728); and with CD activity. *PPARG* (rs1801282); X-ray repair cross-complementing protein 1, *XRCC1* (rs25487) associated with colorectal adenoma, and SCD- Stearoyl-coA desaturase (rs 2060792) with inflammation. These genotypes were assessed using custom SNP Sequenom MassARRAY analyses.

Results: The three variants: TT in rs12934922, (*BCM01*); GG in rs10741657, (*CYP2R1*) and TT in rs174583 (*FADS2*) had a representation of more than 16%. The- frequencies of these SNPs known to associate with low betacarotene absorption and vitamin D concentration and negative fatty acid interactions respectively, were 18, 39 and 16% in both the healthy as well as the CD groups in these cohorts.. These frequencies are similar to other reported healthy European groups of 24, 38 and 13%.

Conclusion: Around 16%–39% of the NZ population maybe deprived of these anti-inflammatory nutrient requirements due to these variant genotypes.