Abstract:

Catechol O-methyltransferase (COMT) inactivates neurotransmitters, hormones and drugs such as levodopa. COMT activity is inherited in an autosomal recessive manner and individuals with low activity have thermolabile COMT protein. A low activity allele has been demonstrated at codon 108/158 of the soluble and membrane bound COMT protein, respectively, whereby a G to A transition results in a valine to methionine substitution, rendering the protein more thermolabile. As ethnic differences in erythrocyte COMT activity have been previously demonstrated, the frequency of low activity alleles were investigated in 265 British Caucasian, 99 British South-west Asian and 102 Kenyan individuals. Genotyping of COMT codon 108/158 was performed using a minisequencing method. Erythrocyte COMT activity was measured in 60 British Caucasian individuals by radiochemical assay. The frequency of low activity alleles was 0.54 in Caucasians, 0.49 in South-west Asians, and 0.32 in Kenyans. There was a much lower frequency of individuals with homozygous low activity allele in the Kenyan population (9%) than in Caucasians (31%) or Southwest Asians (27%). Erythrocyte COMT activity was lower and less thermostable in individuals with homozygous low activity alleles. The data provide molecular evidence that low COMT is less common in African individuals than the Caucasian population.