The association between APC I1307K allele and colorectal and non-colorectal cancer risk

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Background: the APC I1307K missense mutation has been detected in 6–7% of the general Ashkenazi Jewish (AJ) population and in 10%–28% of AJ with either a personal or family history of colorectal cancer (CRC) or adenomatous polyps. Aim of study: was to confirm this association and to evaluate the role of I1307K in non colorectal neoplasms.

Subjects and Methods: Clinical data and blood samples were collected from individuals undergoing annual screening at the Cancer Prevention Center in the Tel-Aviv Medical Center. The APC I1307K was detected using real-time PCR (polymerase chain reaction) from DNA extracted from peripheral mononuclear cells. The prevalence of personal history of CRC, colorectal adenomatous polyps and non-colorectal cancers among I1307K carriers and non-carriers was compared.

Results: Overall, the APC I1307K variant was detected in 455/5937 (7.7%) individuals undergoing testing (10.7% Ashkenazi, 1.5% Sephardic). A personal history of any type of neoplasm was reported by I1307K carriers with an odds ratio (OR) of 2.48 (95% CI 2.0–3.0, \(P=0.0001\)) compared with non-carriers. Significant increased OR was found for personal histories of colorectal and several other types of cancer (Colorectal adenomatous polyps: OR 1.98 (95% CI 1.5–2.3, \(P=0.001\); Colorectal cancer (CRC): OR 1.98 (95% CI 1.5–2.6, \(P=0.001\); Pancreas: OR 1.79 (95% CI 0.99–3.2, \(P=0.05\); Breast: OR 1.9 (95% CI 1.2–3.1, \(P=0.008\); Lung: OR 3.2 (95% CI 1.3–8, \(P=0.01\); Skin cancers: OR 2.1 (95% CI 1.2–3.8, \(P=0.01\)). No significant association was found between a personal history of other types of cancers (esophagus, stomach, prostate, gynecological, kidney and urinary tract, hematological, brain, endocrine and liver) and I1307K carrier state. Conclusion: Our study confirmed the association between I1307K and colorectal neoplasms and found an association between this variant and pancreatic, breast, lung and melanoma cancers.