ColoLipidGene: signature of lipid metabolism-related genes to predict prognosis in stage-II colon cancer patients

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ABSTRACT

Lipid metabolism plays an essential role in carcinogenesis due to the requirements of tumoral cells to sustain increased structural, energetic and biosynthetic precursor demands for cell proliferation. We investigated the association between expression of lipid metabolism-related genes and clinical outcome in intermediate-stage colon cancer patients with the aim of identifying a metabolic profile associated with greater malignancy and increased risk of relapse. Expression profile of 70 lipid metabolism-related genes was determined in 77 patients with stage II colon cancer. Cox regression analyses using c-index methodology was applied to identify a metabolic-related signature associated to prognosis. The metabolic signature was further confirmed in two independent validation sets of 120 patients and additionally, in a group of 264 patients from a public database. The combined analysis of these 4 genes, ABCA1, ACSL1, AGPAT1 and SCD, constitutes a metabolic-signature (ColoLipidGene) able to accurately stratify stage II colon cancer patients with 5-fold higher risk of relapse with strong statistical power in the four independent groups of patients. The identification of a group of 4 genes that predict survival in intermediate-stage colon cancer patients allows delineation of a high-risk group that may benefit from adjuvant therapy, and avoids the toxic and unnecessary chemotherapy in patients classified as low-risk group.