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Biomarkers for Rectal Adenocarcinoma Identified by Lipidomic and Bioinformatic

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Abstract : Lipidomic strategy can provide important information regarding cancer pathogenesis mechanisms and could reveal new biomarkers to enable early diagnosis of rectal adenocarcinoma (RAC). This study set out to evaluate lipoperoxidation biomarkers, and lipidomic signature by gas chromatography (GC) and electrospray ionization-qToF-mass spectrometry (ESI-qToF-MS) combined with multivariate data analysis in plasma from 23 RAC patients (early- or advanced-stages cancer) and 18 healthy controls. The most abundant ions identified in the RAC patients were those of phosphatidylcholine (PC) and phosphatidylethanolamine (PE) while those of lisophosphatidylcholine (LPC), identified as LPC (16:1), LPC (18:1) and LPC (18:2), were down-regulated. LPC plasmalogen containing palmitoleic acid (LPC (P-16:1)), with highest VIP score, showed a low tendency in the cancer patients. Malondialdehyde plasma levels were higher in patients with advanced cancer (III/IV stages) than in the early stages groups and the healthy group ($p<0.05$). No differences in F2-isoprostane levels were observed between these groups. This study shows that the reduction in plasma levels of LPC plasmalogens associated to an increase in MDA levels may indicate increased oxidative stress in these patients and identify the metabolite LPC (P-16:1) as new biomarkers for RAC.

Keywords : biomarkers, lipidomic, plasmalogen, rectal adenocarcinoma
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