Boswellia serrata (ácido boswéllico) demetila e acorda genes supressores de tumor no câncer coloretal – efeito epigenético

Boswellic acid induces epigenetic alterations by modulating DNA methylation in colorectal cancer cells.

Shen Y, Takahashi M, Byun HM, Link A, Sharma N, Balaguer F, Leung HC, Boland CR, Goel A.
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Abstract

Accumulating evidence suggests that chemopreventive effects of some dietary polyphenols may in part be mediated by their ability to influence epigenetic mechanisms in cancer cells. Boswellic acids, derived from the plant Boswellia serrata, have long been used for the treatment of various inflammatory diseases due to their potent anti-inflammatory activities. Recent preclinical studies have also suggested that this compound has anti-cancer potential against various malignancies. However, the precise molecular mechanisms underlying their anti-cancer effects remain elusive. Herein, we report that boswellic acids modulate DNA methylation status of several tumor suppressor genes in colorectal cancer (CRC) cells. We treated RKO, SW48 and SW480 CRC cell lines with the active principle present in boswellic acids, acetyl-keto-β-boswellic acid (AKBA). Using genome-wide DNA methylation and gene expression microarray analyses, we discovered that AKBA induced a modest genome-wide demethylation that permitted simultaneous re-activation of the corresponding tumor suppressor genes. The quantitative methylation-specific PCR and RT-PCR validated the gene demethylation and re-expression in several putative tumor suppressor genes including SAMD14 and SMPD3. Furthermore, AKBA inhibited DNMT activity in CRC cells. Taken together, these results lend further support to the growing notion that anti-cancer effect of boswellic acids may in part be due to its ability to demethylate and reactivate methylation-silenced tumor suppressor genes. These results suggest that not only boswellic acid might be a promising epigenetic modulator in the chemoprevention and treatment of CRC, but also provide a rationale for future investigations on the usefulness of such botanicals for epigenetic therapy in other human malignancies.

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