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Cocoa shown to have role in colorectal cancer reduction: Review

By Nicola Cottam, 22-May-2014

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Cocoa polyphenols can suppress oxidative stress that provokes the proliferation of cancerous cells in the colon, according to a study published in the book *Cancer: Oxidative Stress and Dietary Antioxidants*.

Colorectal cancer (CRC) is a major contributor to cancer-related mortality, say the authors, because the gastrointestinal tract in the colon is vulnerable to overproduction of 'reactive oxygen species (ROS)', which can induce the production of cancerous cells.

"ROS overproduction may provoke structure and function damages in colonic cells and induce somatic mutations and neoplastic transformation," the scientists explained.

"Because of this, the suppression of oxidative stress by natural antioxidant compounds has gained interest as an effective approach in CRC prevention. Oxidative stress has the potential to affect a large array of carcinogenic pathways involved in proliferation of initiated cells and enhanced malignant transformation."

'Natural' cancer prevention

The high incidence of CRC has provoked a lot of interest in chemoprevention, which involves using natural or synthetic compounds to reverse the development of cancers.

As a result, the possible impact of several nutritional products with antioxidant and anti-inflammatory properties has been extensively studied in recent years and cocoa polyphenols, in particular, have been identified as 'promising candidates for colon cancer chemoprevention'.

"Cocoa, the dried and fermented seeds derived from *Theobroma cacao*, has the highest flavanol content of all foods on a per-weight basis and is a significant contributor to the total dietary intake of flavonoids," the report said.

"For many individuals, cocoa products constitute a larger proportion of the diet than foodstuffs containing bioactive compounds with similar properties such as green tea, wine, or soy beans."

Supporting evidence

The report reviews various *in vitro* studies illustrating the effects of cocoa on cell formation to demonstrate how these mechanisms can be applied in practice.

Studies showed that pre-treating intestinal cells with a cocoa phenolic extract, or a pure cocoa flavanol, for 20 hours counteracted acrylamide-induced cytotoxicity and treatment with a combination of flavanols and cocoa phenolic extract stopped the subsequent increase in ROS.

"Flavanols and a cocoa phenolic extract could protect cell constituents not only by neutralizing several types of radicals but also by up-regulating antioxidant defences as well as by interacting with signalling pathways involved in cell survival," the researchers said.

Pre-treatment with cocoa phenolic extract also reduced inflammation in the colon, which is associated with carcinogenesis, and further a study showed for the first time that a cocoa-enriched diet was able to suppress the early phase of chemically induced colon carcinogenesis in rats.

"Daily consumption of small amounts of flavanols and procyanidins from cocoa or chocolate, in conjunction with usual dietary intake of flavonoids, would constitute a natural approach to potentially prevent colon cancer with minimal toxicity," they concluded.

Source: *Cancer: Oxidative Stress and Dietary Antioxidants*

'Antioxidative Stress Actions of Cocoa in Colonic Cancer'

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