Is Conventional Pomegranate Extract Enough?

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POMEGRANATE SEED OIL: A POTENT CANCER FIGHTER

Cutting-edge research has uncovered numerous life-saving modes of action for pomegranate seed oil, most notably in the area of chemoprevention. Other roles for pomegranate seed oil include facilitating repair of aging skin, immune function modulation, and inflammation reduction.

The data on pomegranate seed oil’s cancer fighting potential is most compelling in tissues of the male and female reproductive systems. Pomegranate seed oil is a potent inhibitor of aromatase, the enzyme that produces estrogen from testosterone, and 17-beta-hydroxysteroid dehydrogenase type 1, which is responsible for the conversion of estrone to potent estradiol. This enzymatic blockade contributes to pomegranate seed oil’s ability to inhibit growth of estrogen-dependent breast cancer cells in culture. It also reduces the cancer cells’ invasiveness (ability to cross barriers). A separate mechanism is also clearly at work here, because the oil also increases cellular suicide (apoptosis) even in cancer cells that lack estrogen receptors.

Cancer cells need to grow new blood vessels to support their rapid growth and tissue invasion (angiogenesis). They typically do this by ramping up production of a variety of growth factors, including vascular endothelial growth factor (VEGF) and inflammatory interleukins.

NATURAL LIPID AND GLUCOSE CONTROL: PON AND PPAR ACTIVATORS

Polyphenols in pomegranate juice increase the activity of the vital paraoxonase (PON) enzymes PON-1 and PON-2. PON-1 supports artery-cleansing HDL by stabilizing its molecular complex against oxidation and breakdown and helping cellular scavengers (macrophages) remove oxidized cholesterol from tissue. PON-2 exerts similar antioxidant protection at the cellular level rather than in the blood.

Pomegranate juice polyphenols work by increasing gene expression of both PON enzymes, while also preventing PON-1 inactivation and increasing the stability of its binding to HDL cholesterol. Other components of the pomegranate tree, including its flowers and seeds, have displayed similar effects, particularly on PON-2.

These additional botanical constituents also affect another set of intracellular protein complexes: peroxisome proliferator-activated receptors (PPAR) alpha and gamma. Both are transcription factors that regulate how and when genes become activated. Between them they tightly regulate fatty acid uptake and storage, glucose metabolism, and inflammation.

Drugs in the family of fibrates (gemfibrozil, fenofibrate, and others) are synthetic PPAR-alpha activators that can help improve lipid profiles, while drugs in the thiazolidinedione family (such as rosiglitazone) are synthetic PPAR-gamma activators that help lower blood glucose. Both categories of drugs, however, cause significant adverse side effects. To date, efforts to develop a drug that activates both PPARs (a clearly desirable action) have failed. A recent explosion of data on the pomegranate flower suggests that this component of the pomegranate tree possesses these dual PPAR-alpha/gamma activator properties, a finding with profound implications for treatment of diabetes and its complications.

Pomegranate seed oil powerfully inhibits production of VEGF while upregulating production of migratory inhibitory factor (MIF) in breast cancer cells. In a laboratory model of vessel growth, these modulations translated into a significant decrease in new blood vessel formation. Pomegranate seed oil’s capacity to block breast cancer development was also demonstrated in an organ culture model of mouse breast cancer. Treating the glands with the oil prior to exposure to a powerful carcinogen resulted in an astonishing 87% reduction in the number of cancerous lesions compared with controls—substantially greater protection than has been previously reported for derivatives of pomegranate juice.
As with flower extracts, pomegranate seed oil contains a number of unique chemical constituents with potent biological effects. *Punica acid* is an omega-5 polyunsaturated fatty acid that inhibits both estrogen-dependent and estrogen-independent breast cancer cell proliferation in lab cultures. Punicic acid also induced apoptosis at rates up to 91% higher than those in untreated cell cultures—effects which appear to be related to fundamental regulation of cancer cell signaling pathways.

Another common malignancy that often depends on sex hormones for its growth is prostate cancer, a leading cause of cancer-related mortality in American men, accounting for more than 29,000 deaths each year. Because of its slow rate of growth and appearance later in life, prostate cancer has been identified as an ideal target for nutritional chemoprevention.

Pomegranate seed oil sharply inhibits proliferation of a number of human prostate cancer lines through changes in the cell growth cycle and also by inducing apoptosis (cell death). At the same time, it has been shown to powerfully suppress cancer cell invasion. Pomegranate oil also acts in synergy with other pomegranate components, suppressing prostate cancer proliferation and metastatic potential more effectively than each component individually.

References

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