

Saw Palmetto may fight prostate cancer

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Editorial comment on 'Saw Palmetto may fight Prostate Cancer' by Reuters News more than 20 years ago reported from the American Society of Cell Biology meeting, later published by Goldmann et al. (2001).

Saw Palmetto berry extracts (SPBEs), a common herbal supplement taken by men with enlarged prostates, may also have anticancer properties. Led by Dr. C. Pal Sharma of Boston Bioproducts in Milford, MA 01757, the research team analyzed the effect of SPBE on cancer cells. They exposed prostate cancer cells and a common cancer cell line to different concentrations of berry extract and monitored their growth in the laboratory. They found that a much smaller amount of SPBE was required for prostate cancer cells than for common cancer cells, suggesting that SPBE is very specific to prostate cancer cells, even though the expression of COX-2 protein was similarly reduced in both types of cancer cells after SPBE exposure. In addition, the same research group later identified eight sterol components, of which beta-sitosterol and stigmasterol inhibit prostate cancer growth by increasing p53 protein expression and reduce carcinogenesis in DU145 cells by decreasing p21 and p27 protein expression (Scholtyssek et al., 2009). These findings demonstrated the potential of sterols from SPBE as potential antitumor agents.

Around the same time, De Lemos (2002) measured the effect of a herbal supplement, named PC-SPES on prostate cancer and found that PC-SPES was associated with some efficacy in prostate cancer patients. The author concluded that PC-SPES may have a role for patients who have failed standard treatments for androgen-independent disease and have no history of thromboembolism or abnormal bleeding and that PC-SPES has a toxicity profile similar to that of androgen suppression and estrogen therapy. In another study, Marks et al. (2002) showed that PC-SPES has promise as a treatment for prostate cancer, but more research is needed to determine the optimal dosage and to investigate potential side effects. At around the same time, Nelson and Montgomery (2003) reviewed the

available evidence of unconventional therapies for prostate cancer, including dietary supplements, herbs, and other natural products. They concluded that while some unconventional therapies showed promise in preclinical studies, the evidence for their effectiveness in treating prostate cancer in humans is limited, and some therapies could even be harmful. The authors went on to say that, while some herbal therapies have shown promise in preliminary studies, there is insufficient evidence to support their routine use in clinical practice.

Yang et al. (2007) investigated the mechanism of action of Saw Palmetto by inhibiting prostate cancer cell growth. They found that Saw Palmetto inhibited the androgen receptor (AR) and STAT3 signaling pathways, leading to growth arrest and apoptosis in cancer cells. Purified Saw Palmetto induced (i) growth arrest of prostate cancer LNCaP, DU145, and PC3 cells, and (ii) apoptosis of LNCaP cells in a time- and dose-dependent manner, and (iii) increased the expression of p21waf1 and p53 protein. In addition, the authors found that Saw Palmetto downregulated dihydrotestosterone (DHT)- or interleukin (IL)-6-induced expression of prostate-specific antigen (PSA) in conjunction with downregulation of nuclear AR levels. Saw Palmetto also downregulated IL-6-induced levels of the phosphorylated form of STAT3 in LNCaP cells and inhibited the growth of LNCaP cells as tumor xenografts in BALB/c nude mice without adverse effects. All these results suggest that Saw Palmetto may be useful in treating people with prostate cancer. The study by Von Löw et al. (2007) reviewed the preclinical and clinical data on various herbal therapies for prostate cancer, including PC-SPES. They found that PC-SPES showed promises in clinical trials, but was associated with serious side effects such as blood clots, breast enlargement, and liver toxicity, and concluded that, although some herbal therapies showed promise in preclinical and clinical studies, more research was needed to determine their safety and efficacy, and to standardize their formulations.

In addition, Klempner and Bubley (2012) reviewed the evidence for complementary and alternative medicines (CAMs) for prostate

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cancer and concluded that some CAMs may have therapeutic benefits, but more rigorous studies are needed to confirm their efficacy and safety, while also educating oncologists and patients.

Silvestri et al. (2013) investigated the effect of (*Serenoa repens*, SR = Saw Palmetto) on the expression of inflammation-related genes in primary cell cultures of human prostate cancer. Chronic inflammation is a known risk factor for the development of prostate cancer. SR is known to have anti-inflammatory properties and is often used to treat benign prostatic hyperplasia (BPH). The researchers used quantitative polymerase chain reaction to assess the expression of inflammation-related genes in prostate cancer cells treated with SR. The study showed that SR treatment led to significant down-regulation of inflammation-related genes in prostate cancer cells and activation of the nuclear factor- κ B pathway in prostate tissue. These findings suggest that SR may be a promising natural compound for the prevention and treatment of prostate cancer.

Opoku-Acheampong et al. (2016) investigated the effect of Saw Palmetto supplements (SPS) on the growth of androgen-sensitive prostate cancer cells. They found that Saw Palmetto extract inhibited cell growth in vitro and in vivo. In general, the lack of difference in efficacy of SPS with different nutrient profiles could mean that laurate, myristate, oleate, linoleate, campesterol, stigmasterol, and β -sitosterol are not the only bioactive components, or that there is a synergistic effect of specific or all fatty acids and/or phytosterols in SPS are responsible for the antiandrogenic activity. Tsai et al. (2017) found that a standardized herbal extract could reduce tumor inflammation and enhance the effects of chemotherapy in prostate cancer cells.

Recently, Grammatikopoulou et al. (2020) conducted a review of randomized controlled trials investigating the effect of dietary factors and dietary supplements on PSA levels in men with prostate cancer and increased cancer risk. They found limited evidence to support the use of Saw Palmetto and other herbal products to reduce PSA levels. Fontana et al. (2020) provided a comprehensive review of the molecular mechanisms and targets of various natural products for the prevention and treatment of prostate cancer. They concluded that the use of phytochemicals in the treatment of prostate cancer has several advantages: natural products are generally safe and well tolerated, and they are usually affordable. In addition, they are endowed with various in vitro and in vivo antitumor properties, including growth-suppressive, death-promoting, anti-invasive, and anti-angiogenic activities. In particular, they selectively target the AR signaling axis and cellular metabolism which are hallmarks of prostate cancer. These promising pleiotropic effects have been partially confirmed in prostate cancer patients, where phytochemical use has been associated with chemoprevention and PSA reduction rather than tumor eradication.

In conclusion, more rigorous studies are needed to evaluate the efficacy and safety of natural products in the treatment of prostate cancer.

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