New Clinical Trial: Modified Citrus Pectin Halts Prostate Cancer Progression

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Study further demonstrates modified citrus pectin's significant anti-cancer actions.

A new double-blind clinical trial on modified citrus pectin (MCP) against biochemically relapsed prostate cancer is opening new doors in the treatment of this aggressive disease. Results published on the first set of subjects highlight the ability of MCP to halt prostate cancer progression and improve clinical symptoms and quality of life in patients for whom effective treatment options have historically been limited. MCP is a dietary supplement derived from citrus pectin and is modified for enhanced absorption and bioactivity in the circulation.

The multi-center clinical trial is continuing through 2018, however, interim results garnered significant attention when presented at the American Society of Clinical Oncology (ASCO) 2018 Genitourinary Symposium and published in the Journal of Clinical Oncology. Of the first 34 patients completing six months of MCP therapy, 79 percent (n = 27) had stabilization or improvement of prostate-specific antigen (PSA) doubling time, and negative prostate-specific membrane antigen (PSMA). Of these, 21 had a stabilization or decrease of PSA. Disease progression measured by an increase in PSA doubling time with positive scans was seen in only 9 percent (n=3) and by PSA doubling time alone in 12 percent (n = 4). No serious side effects were observed.1

The patients enrolled in this study had non-metastatic biochemically relapsed prostate cancer, with three progressively rising PSA tests. Participants received 4.8 grams of MCP, three times a day, for six months. Since all patients demonstrated an escalation of PSA prior to the study, the reduction of PSA doubling times in 79 percent of cases is an important and promising result, indicating the efficacy of MCP in slowing the advancement of invasive prostate cancer.

While these clinical results are newsworthy, they are not isolated. A specific form of MCP used in this study—the type that contains the correct, precise low molecular weight and structure to be absorbed into the circulation—is one of the most researched natural products being investigated today. To date, more than 40 published studies demonstrate this specific MCP's health benefits, including three clinical studies in prostate cancer. And this number is growing quickly, as more independent researchers around the globe investigate the unique mechanisms that make MCP a promising adjunct in promoting health and longevity in the face of serious progressive and chronic diseases.

Why is MCP so effective? Because it has an unmatched ability to block the destructive actions of galectin-3 (Gal-3), an initiator driver of cancer and chronic disease. More than 8,000 published

studies now point to the role of Gal-3 as an important regulator of diverse and critical functions in cancer biology, chronic inflammation, fibrosis and more.

Elevated Galectin-3: Guardian of the Tumor Microenvironment

Gal-3 is gaining significant attention for its role in regulating the tumor microenvironment, as well as numerous other pathogenic processes. One of the fastest growing fields of medical research, compelling clinical and preclinical studies continue to demonstrate the multiple pathways and mechanisms by which overexpression of Gal-3 fuels the development and metastasis of cancer, cardiac failure, organ fibrosis, neurodegenerative disease, arthritic illnesses, immune dysregulation and other conditions.2-8

Normally, Gal-3 is found in small amounts in our bodies and performs essential functions. However, extracellular levels in the circulation are shown to rise with age, injury and chronic illness. In cancer, Gal-3 originates from tumor cells, as well as macrophages and mesenchymal stromal cells (MSC) within the tumor microenvironment. Through intra- and extracellular actions, Gal-3 promotes cancer cell survival, tumorigenesis, angiogenesis and metastasis, and allows cancer to evade the immune system.

Cellular Gal-3 acts mainly in anti-apoptotic signaling pathways, supporting tumor growth and allowing it to become resistant to the effects of conventional treatments, particularly chemotherapy drugs. In the extracellular matrix, however, Gal-3 plays a more significant role in controlling the tumor microenvironment. Because it is over-expressed, secreted and attaches to the surface of cancer cells, it acts as an adhesion surface protein capable of forming lattices and scaffolding with itself. It binds surface membrane glycoproteins and glycolipids receptors, interrupting normal cell to cell communication, and forms a gel-like biofilm that acts as an anchor for other pro-cancerous growth factors and inflammatory compounds in the extracellular matrix.9

Gal-3 interacts through its carbohydrate recognition domain (CRD) regions on three levels—inside tumor cells themselves (intracellular), between tumor cells and extracellular matrix components, and between tumor and immune cells. Because of its leading role in orchestrating these interactions, Gal-3 has been called the “guardian of the tumor microenvironment.”9

Essentially, Gal-3 has four major roles in cancer progression:

1) Supports tumorigenesis
2) Promotes metastasis
3) Drives angiogenesis
4) Allows immune evasion

A simple Gal-3 blood test is available and can be used in conjunction with other diagnostic tools to measure the risk and progression of some of our most serious health concerns. Because of its leading role in driving inflammation and the progression of inflammation to fibrosis, the Gal-3

test was approved by the FDA (U.S. Food and Drug Administration) in 2011 as a diagnostic and prognostic indicator of congestive heart failure. This simple assay may also be considered for use as a complement to the PSA test in prostate cancer assessment, and is used by a growing number of practitioners in measuring risks and progression of other cancers.

As indicated in the extensive body of research, mitigating the harmful effects of Gal-3 is critically important in maintaining health and longevity. According to the literature and as mentioned above, the only available proven Gal-3 blocker is a specific form of MCP with a molecular weight range of 3-13 kilodaltons, and esterification less than 5 percent.

This form of MCP is shown to be effective in reducing cancer growth and metastasis, preventing and reversing fibrosis, lessening nerve pain, and protecting organs and tissues. In fact, it is the most-researched Gal-3 blocker, shown in numerous studies to bind and block excess Gal-3 and reduce its harmful actions throughout the body.

MCP and Galectin-3 Research in Cancer

A fast-growing body of published data points to MCP's diverse anti-cancer mechanisms and effects, mainly demonstrating its ability to downregulate Gal-3 activity. MCP was the first reported natural inhibitor of Gal-3 activity in melanoma, prostate, colon and breast cancer.10-14 Early animal studies exploring MCP's efficacy against metastases were conducted at Wayne State University and showed MCP successful in inhibiting the binding of prostate cancer cells to endothelial cells.12 The researchers continued studies on triple negative breast cancer models in animals. MCP's impact on tumor growth, angiogenesis and metastasis was reported, with the degree of benefit improved using higher doses of MCP.14 Researchers at Columbia University (New York) tested MCP to determine its impact on both androgen-dependent and androgen-independent prostate cancer cell lines. The authors concluded that MCP inhibited cell proliferation and apoptosis in all the prostate cancer cell lines.15 Further studies have recently shown that MCP inhibits gastrointestinal cancer cells,16 and bladder tumor growth through downregulation of Gal-3.17

MCP is also shown in to enhance the effects of certain chemotherapy drugs. Inhibition of Gal-3 by MCP is shown to reverse multiple myeloma cell resistance to bortezomib and enhance apoptosis induced by dexamethasone.18 Combination effect of MCP and doxorubicin on viability, cell cycle arrest and apoptosis in prostate cancer cells demonstrated synergistic enhancement of doxorubicin toxicity, regardless of androgen dependency.19 Synergistic effect of MCP and paclitaxel was also demonstrated with ovarian cancer cells.20

These results show that adding MCP to therapeutic regimens for treating cancers where Gal-3 is overexpressed could significantly improve the effects of chemotherapy, possibly allowing for lower chemotherapy dosages and fewer side effects.

MCP is also shown to enhance radiation treatment. Data from a study presented at the 2015 American Society for Cancer Research Conference on several androgen-independent prostate cancer cell lines, showed that exposure to increasing concentrations of MCP significantly enhanced the cell-killing ability of radiation.21

Published clinical data on MCP in cancer, as well as extensive clinical anecdotal observation over the last three decades, reinforce these preclinical study findings. An early pilot study showed that MCP increased the PSA doubling time in seven out of 10 men taking MCP for 12 months, compared with PSA progression before taking MCP.22 In another compassionate care clinical study performed in Germany, 49 advanced end-stage cancer patients with multiple cancer types including colorectal, prostate, breast, kidney, lung, uterine, liver, pharynx, pancreatic, melanoma, stomach, bile duct and chondrosarcoma, were given MCP for a four-week cycle. After two cycles of treatment with MCP, 21 percent of the patients had a clinical benefit of disease stabilization or improved quality of life. A patient with stage IV metastatic prostate cancer showed a 50 percent decrease in serum PSA level after 16 weeks of treatment, improving his quality of life and decreasing pain.23

One critical point among all of these studies is the importance of choosing the correct form of MCP. The MCP studied in the published literature, and importantly, the only available agent shown effective in binding and blocking excess Gal-3, offers promising adjuvant therapy for cancer and other conditions.

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