Nutrition and Cancer

The main scenario of succumbing to cancer is cachexia, which means loss of muscle mass and weight. There is a strong relationship between muscle mass and the immune system. When we lose muscle not only do the T- and B- lymphocyte count and function deteriorate; it also results in immobility, drops the performance status (the global measure of our well-being), and weakens the respiratory muscles which results in pneumonia. Pneumonia used to be termed “old man’s best friend,” but in modern terms, it is coined the “cancer patient’s best friend.” So, maintaining muscle mass---or better yet, building it---could and does result in better longevity.

What can build muscle mass? Not vitamins. They have no role in protein synthesis. The answer is calories and anabolism (building protein blocks of the muscle mass). Teleological thought would tell us that eating a protein-rich diet would build muscle mass, but that is not feasible in the general catabolic cancer state. Advanced cancer breaks down protein and inhibits protein synthesis through cachexins (cancer cell mediators of protein breakdown). So, the solution rests on two pillars: first, shrink the cancer and second, enhance protein build-up.

This reached the scientific cancer research community with a conclusion: we must shrink the cancer volume and enhance anabolic pathways. Cancer treatment modalities paradoxically inhibit anabolism and muscle build-up, so we had to come up with methods to counter this by creating novel compounds that enhance muscle build-up. Development of such compounds would be, in poker terminology, a “royal flush.”

Currently, we are experimenting with two different approaches to achieve that goal. One way is by using selective androgen receptor stimulants that enhance muscle mass build-up while avoiding the usual known unwanted side- effects of the androgen function. We have a clinical trial for lung cancer to address this scenario with very promising initial evidence. In this Pharmaceutical clinical trial patients with stage III & IV non-small cell lung cancer are randomized to two arms. Arm A patients receive standard chemotherapy alone while patients randomized to Arm B of the trial receive the same chemotherapy plus the experimental selective androgen stimulant. The endpoints of the trial are measuring functional muscle capacity through complex electronic methods, in addition to, objective assessment of muscle mass by dexa scan and MRI of the muscle volume.

Secondly, a novel monoclonal antibody has proven efficacy in building muscle mass in livestock. This agent blocks the myosin receptor in the muscle cells. Myosin inhibits muscle growth. Blocking it resulted in a substantial increase in muscle mass (meat). Currently, we are using this agent in patients with pancreatic and lung cancer. The intent is not only increasing patients’ muscle mass, but also improving their functional status, strengthening their immune system, and prolonging their lives. It is work in progress, but progress can only come through trial and error.

Your patients are welcome to be part of this clinical trial available at our cancer center where we fight cancer on all fronts: killing cancer cells, building the immune system, and building muscle mass. This work is slow, but it is resulting in incremental gains. Fighting cancer is not a fight in a boxing ring where one punch decides the winner. It is a series of battles in a long war. Each victory is a milestone towards an outright conquest of this formidable enemy. Every physician who encounters a cancer patient is a fighter in this war. Cancer patients cannot be part of this war unless they are given the opportunity to be a soldier in the battlefield.

Nash Gabrail, MD