



Dietary Composition and Caloric Intake Associated with Patient Prognosis

Stefan Blaak*

Department of Public Health Nutrition, University of Copenhagen, Copenhagen, Denmark

DESCRIPTION

Ovarian cancer remains one of the leading causes of gynecologic cancer-related mortality globally. Despite advancements in surgical and pharmacologic interventions, long-term survival outcomes remain suboptimal for many patients. Factors influencing prognosis extend beyond clinical staging and treatment protocols. Emerging evidence highlights the significance of nutritional status and dietary intake in modulating disease progression and survival.

Among various nutritional parameters, both the quantity and quality of macronutrient intake are gaining research attention. Macronutrients namely proteins, fats and carbohydrates play vital roles in immune function, tissue repair and metabolic regulation, all of which are particularly relevant during and after cancer treatment. However, the type and source of these nutrients, not merely the amount, may influence biological outcomes in patients undergoing cancer therapy.

Understanding macronutrient role in cancer context

Macronutrient quality refers to the source, biological value and metabolic effects of proteins, fats and carbohydrates. For example, in protein intake, animal-based and plant-based proteins differ in their amino acid profiles and associated effects on inflammation and metabolism. Similarly, fats derived from unsaturated plant sources contrast significantly in physiological impact when compared to saturated fats from animal products.

Carbohydrates, too, vary widely in quality. Whole grains, legumes, fruits and vegetables offer complex carbohydrates and fiber that support metabolic stability, whereas refined sugars and processed starches are linked with glycemic variability and systemic inflammation. These variations are particularly relevant in cancer management, as inflammatory responses, glucose

control and body composition are closely tied to disease outcomes.

Dietary intake and energy balance

Energy balance reflects the relationship between energy intake through food and energy expenditure via basal metabolism and physical activity. In the context of cancer, both negative and excessive energy balance can influence prognosis.

Energy deficits, often arising from treatment-related side effects such as nausea, mucositis and anorexia, can lead to unintentional weight loss and muscle wasting—factors associated with reduced survival. On the other hand, excessive intake, especially of energy-dense but nutritionally poor foods, may contribute to metabolic dysregulation, adiposity and poor treatment response.

The quality of macronutrient intake, when assessed alongside total caloric intake, may thus offer a more comprehensive perspective on nutritional status than either measure alone. Specific macronutrient-energy combinations might support a more favorable internal environment for recovery, immune regulation and cellular repair.

Evidence from observational studies

Several observational cohort studies have evaluated dietary patterns in cancer patients and their relationship with outcomes. In ovarian cancer, data remain limited but growing. In some studies, higher intake of high-quality proteins (especially those from fish, legumes and nuts) has been associated with improved overall survival. Conversely, high intake of processed meats and saturated fats has correlated with poorer outcomes.

One study found that among women diagnosed with ovarian cancer, those who consumed diets rich in complex carbohydrates, fiber and plant-based proteins had lower all-cause and disease-specific mortality over a five-year follow-up.

Correspondence to: Stefan Blaak, Department of Public Health Nutrition, University of Copenhagen, Copenhagen, Denmark, E-mail: sblaak@ucn.dk

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Importantly, these associations remained significant even after adjusting for total energy intake, suggesting that the quality of macronutrients contributed independently to survival.

Similarly, intake of unsaturated fats, particularly omega-3 fatty acids from marine sources, has been associated with improved chemotherapy tolerance and reduced systemic inflammation, both of which can influence survival trajectories.

Potential biological mechanisms

The relationship between macronutrient quality and survival in ovarian cancer may be mediated through several mechanisms. Rapid glucose fluctuations associated with high-glycemic-load diets may fuel tumor cell proliferation. Whole food sources of carbohydrates, which release glucose more gradually, can promote metabolic stability and reduce insulin-mediated growth signaling.

High-quality protein intake, particularly in the presence of adequate energy, supports muscle protein synthesis and reduces

sarcopenia. Loss of lean mass has been consistently associated with lower chemotherapy tolerance and poorer survival. Fiber-rich and plant-based diets influence gut microbiota composition, which can in turn affect systemic immunity, nutrient absorption and inflammation all factors relevant to cancer progression and recovery.

The interaction between macronutrient quality and energy intake appears to play a meaningful role in the survival of patients with ovarian cancer. Diets characterized by high-quality proteins, complex carbohydrates and healthy fats may support better outcomes by modulating inflammation, preserving lean mass and improving metabolic regulation. Although more rigorous studies are needed, integrating individualized nutritional support into standard oncology care may offer a valuable adjunct to medical therapy, enhancing resilience and improving long-term prognosis.