

**Opinion**

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# Underestimated Issues in Cancer Patient

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**\*Corresponding author:** Gertrudis Adrianza De Baptista, Central University of Venezuela, USA.**Received Date:** December 16, 2022**Published Date:** January 09, 2023**Opinion****Highlights**

- Nutritional Condition. Evaluation and Diagnosis. Prevalence.
- Attenuate toxicity, manage treatment times, side effects.
- Body Mass: Malnutrition, Obesity, Undernutrition, Sarcopenic, Cachexia.
- Quality of life, reduction of mortality.
- Immune, Metabolic, and Inflammatory status.
- Microbiota-Microbiome: Prebiotics, Probiotics, Symbiotics. Postbiotics.
- Education.
- ASPEN/ESPEN/SEON/ASCO GUIDES.

**Introduction**

To prevent, as well as improve the quality of life and survival of cancer patients, this must be seen under a multimodal concept and thus obtain the best results from cancer therapy. There are nearly a hundred locations or histological varieties (cancer) that, although with common features, have characteristics with implications of a different clinical-therapeutic and prognostic nature. Malnutrition is the common comorbidity in cancer patients, with determinants linked to the patients, the tumor, and the treatment [1]. Very compromised in the hospitalized patient. The objective of this short writing is to review concepts not seen or used as a priority in some entities where cancer patients are managed.

**Incidence WHO (World Health Organization)**

Cancer is the set of diseases characterized by the progressive accumulation of mutations in the genome of a cell. There are various homeostatic mechanisms that determine the balance between cell proliferation and death. By 2030, the global incidence is expected to rise to 21.7 million cancer cases and 13 million cancer deaths due to population growth and aging. In the USA, Gastric Cancer represents more than 20% of all newly diagnosed cancer cases, considered the fourth most common type and the second leading cause of cancer death. " *Actions Regarding Tobacco Use, Diet and Infections Can Prevent A Third of Cancers and it is Possible to Cure*

*Another Third...* It is necessary to carry out prevention programs at the level of the official organisms of each country. ("no smoking" campaigns, "eat healthy", HPV in gynecological consultations, among others) [2].

### Diet, Cancer and Malnutrition

1. The ideal nutrition can reduce the risk of cancer: Antioxidants, Flavonoids, Foliates, Vit D, Ca, Fats. Pre/probiotics. Different lifestyles that include food -diet e.g.: Mediterranean, Western, Okinawa, etc., of different prognoses in various pathologies.
2. Etiological factors in the appearance of cancer: Acrylamides, Heterocyclic amines. Dietary Trans Fats, Alcohol, Genetics, Epigenetics, health of Gastrointestinal Tract (TGI).
3. Malnutrition such as obesity, undernutrition, it is a common factor in cancer, both in its etiology and in its prognosis. Cancerous cachexia, a devastating syndrome, affects 50-80% of patients, responsible for the death of at least 20%. Skeletal muscle loss, even in the presence of adequate food and insulin intake, has a multifactorial and complex etiology, due to the presence of proinflammatory cytokines and specific tumor-derived factors, which initiate an energy-intensive acute phase protein response. The most relevant phenotypic clinical characteristic of Cachexia Ca is muscle loss and strength (Sarcopenia), since this is related to asthenia, fatigue, deterioration of physical function, reduced tolerance to treatments, deterioration of quality of life and reduced survival. Sarcopenia is present in 20-70% of patients depending on the type of tumor, leading to an increased risk of toxicity in chemotherapy. Identification of patients with muscle loss has become increasingly difficult as 40-60% of cancer patients are overweight or obese, even in the setting of metastatic disease [3,4].
  4. Degree of severity in weight loss:
    - a. Low (31-40%): Breast, Hematological.
    - b. Medium (54-64%): Colon, Prostate, Lung.
    - c. High (>80%): Liver, Pancreas, Esophagus, Stomach, Brain, Head and Neck.
5. Teamwork is decisive in the early and assertive evaluation and treatment of the patient, which reduces morbidity and mortality and improves the quality of life, in respect of the ethics of the professional, the patient and family members [5].
6. Consider: Patients with Malnutrition: Obesity, Undernutrition, Micronutrient and Macronutrient deficiencies, Inflammation, subjected to various treatments, surgical, under radiotherapy, chemotherapy, or Immunotherapy. All require early evaluation and treatment [6,7].
7. They must be included in a multimodal treatment from every point of view: exercises, management of the spiritual part, evaluation and nutritional diagnosis, nutritional therapy, therapy for anemia, among others, to be assertive in personalized treatment [8].
8. The education of the personnel in the oncological area has many deficiencies per se, the patient often tends to be distant

due to low empathy and insufficient knowledge of the personnel [9].

### How to Evaluate and Diagnose?

There are - "gold standard"- EGS- (Subjective Global Assessment) [10] for example in evaluation and diagnosis for Nutritional Status. For body composition, computed tomography (CT), magnetic resonance imaging (MRI), which facilitate the understanding of the prevalence of cancer cachexia (CC). The BMI (Body Mass Index) by itself does not tell us about that body composition. There are classic validated screening instruments (for example, NRS 2002), [11] classic assessment for cancer, Subjective Global Assessment Generated by the Patient (EGS-GP). [12] Another instrument, on which we have been working since 2016 with experts from many countries, is the "GLIM"(Global Leadership of Malnutrition), [13] which brings together many of the known instruments and helps us in the epidemiological area. There are also many validated instruments for the anthropometric field as part of the evaluation, especially when there is no advanced technology.

### Challenges in Trying to Reverse Cancer Cachexia and Sarcopenia

Cancer – Nutrition What to Do? Improve and intervene. "Managed by experts".

- Well-nourished patients have a better prognosis and quality of life due to nutritional status. Nutritional Supplements – important, Omega-3, Protein and e.g.: aa: Leucine - (for muscles) and continuous evaluation. Prevention and treatment are basic.
- Malnutrition and obesity can negatively influence morbidity and mortality in cancer patients.
- Antioxidants, either in food or drugs.
- Radiotherapy-Chemotherapy: Avoid toxicity and its consequences, e.g., mucositis, enteritis, diarrhea, etc., to manage times without interrupting the process.
- Surgery/Immunotherapy. Excellence with the ERAS (Enhance Recovery After Surgery) [14] protocol and Immunonutrition, [15] e.g.: Colorectal cancer. Perioperative with immunonutrition or pharmaconutrition, reduces complications (see ESPEN-ASPEN guidelines).
- Management of the Microbiome/Micro-biota, fiber pre and probiotics/postbiotics, symbiotics/antibiotics. Management of Dysbiosis of the Gastrointestinal Tract [16].
- Short FAST, Ketos Diets, very fashionable: more studies are required.
- Give only food, how? vitamins? Medicines, Pharmaconutrition with experts.
- Give Dietary Supplements, Enteral Nutrition and/or Parenteral Nutrition/NP Supplement.

It should be noted that it is difficult to eat a balanced diet with macro and micronutrients while receiving cancer treatment and if the side effects that arise persist for prolonged periods. With Che-

mo/Radiotherapy some vitamins and minerals could interfere with the effectiveness of the treatment. People “believe” that taking large amounts of vitamins and minerals will boost your immune system or kill cancer cells. Large doses can be harmful. It is necessary to carry out a test to know the levels and manage with the RDA-DRI's. 2021-2022.

### Implications on the Nutritional Status / Tumor

- Decreased intake and energetic and metabolic commitment.
- Catabolic factors (cytokines).
- Anorexia, aversion to food, taste disturbances, dysphagia, odynophagia. Deal with experts.
- Alteration in the production and use of glucose, insulin resistance, mobilization of fats and muscle proteins.
- Cancerous cachexia. multimodal management.

### The Studies Indicate very interesting things like

- The prevention of tumors by whey protein is accompanied by increased levels of glutathione in serum and tissues, and increased proliferation of splenic lymphocytes, phagocytosis, and NK, helper T, and cytotoxic T cell activity [17,18]. The minor component lactoferrin has received the most attention; inhibits intestinal tumors and perhaps tumors at other sites. Lactoferrin acts by induction of apoptosis, inhibition of angiogenesis, modulation of carcinogen-metabolizing enzymes, and perhaps by acting as an iron scavenger [17,18].
- The mechanisms of regulation mediated by the microbiota and of the innate and adaptive immune responses to tumors, the consequences on cancer progression and whether tumors become resistant or susceptible to different therapeutic regimens against cancer.
- On the other hand, the pleiotropic effects of *Butyrate* in maintaining the health and defense of the intestinal mucosa [19].
- Immune modulation through the stimulation of regulatory T cells, the promotion of microbial metabolism and homeostasis and epigenetic modulation (a mixture of fiber consumption and probiotics at the colonic level produce *Butyrate*, propionate, and acetate), studies speak of the benefits of butyrate in colon cancer. *Butyrate* acts as an inhibitor of histone deacetylase- epithelial inflammation and proliferation-, *Which Suppresses the Long-Term Risk of Carcinogenesis* [19].

*Older Population = More Cancer* and chemo and radiotherapy damage all types of cells, immunotherapy tries to stop cell control and make it chronic, but only 10 to 50% have benefit. The answer is different in men and women.

- Some chemotherapies, for example, Intratumoral Gemcitabine, have a positive effect with antibiotics and decrease the size of the tumor in animals (within the tumor tissue).
- Hence the second line of action, in terms of treatment, is “the antibiotic” [20].
- Mixed bacteria (mixed), drugs, other elements such as proton pump inhibitors, obesity, exercises, all this effects the patient's

prognosis. It is not known exactly, but there is strong evidence in this regard.

- Chronic inflammation predisposes to carcinogenesis. Cellular and molecular components of tumor-associated inflammation can affect neoplastic progression [21-23].

*Events and Molecules Involved in this Crosstalk Between the Tumor and the Inflammatory Microenvironment Emerge as Attractive Targets in Therapeutic Intervention Against Cancer with Significant Clinical Impact* [21].

Anti-inflammatory agents should be explored both for the prevention and for the treatment of cancer (Omega 3, Arginine, Glutamine, among others) both in the perioperative period and in radio/chemotherapy treatments. Its true potential will be recognized only through well-controlled clinical trials. The systematic review suggests an overall positive effect of nutritional interventions during chemo(radio)therapy on Body Weight (BW). Subgroup analyses showed effects were driven by high-protein n-3 PUFA-enriched ONS, suggesting the benefit of targeting metabolic alterations [24].

*Systemic Inflammation, Hallmark of Patients with Cancer*, the inflammatory response the driving force behind the metabolic alterations present in these patients.

- “Protective effect of prior anti-inflammatory medications, primarily NSAIDs, against manifestations of the cachexia phenotype at cancer diagnosis. These observations support further exploration of potential therapeutic benefits from anti-inflammatory medications early in cancer”. It is important to provide recommendations for well-designed RCT to determine the effect of nutritional interventions on clinical outcomes, with specific focus on reaching nutritional goals and providing the right nutrients, as part of an integral supportive care approach” [25].
- Chemotherapy exacerbates cancer cachexia.
- Some chemotherapeutic agents induce peracetic cytokines and myostatin.
- *Elucidating Interactions Between Mediators Involved in Cancer Cachexia (Cytokines, Chemokines, Tumor Factors, Myostatin) Could Accelerate the Development of New Therapies Against Cancer-Induced Inflammation and Therefore Cachexia* [26].

### Within the Metabolic Alterations

- The synthesis of cytokines (IL-1, IL-6 and TNF) by the tumor affects motility, gastric emptying, alteration in satiety signals (increase in leptin levels = greater satiety [26].
- Inhibition of lipoprotein lipase (LPL), abnormal elevation in the Cori Cycle, gluconeogenesis, insulin resistance, increased lipolysis, muscle loss caused by muscle breakdown, decreased lipogenesis, and decreased muscle synthesis [26].

Guidelines on Cancer Patient Nutrition should be reviewed and discussed with health personnel ESPEN/ASPEN/SEOM/ASCO/ESMO– European Society Parenteral Nutrition, American Society Parenteral and Enteral Nutrition, Spanish Society of Cancer, American Society of Cancer, European Society for Medical Oncology [27-29].

## Impacts on Metabolism

Protein turnover, muscle loss and increase in acute phase proteins. CHO's (carbohydrates) have peripheral insulin resistance and poor glucose tolerance (it is important to review glycolytic tumors, among others). Lipid oxidation capacity is maintained or increased, especially in those with weight loss. Low muscle mass is associated with early termination of chemotherapy, because of toxicity [30].

## Colophon

Under these concepts issued, cancer treatments have nutritional implications, it is necessary to consider the parameters to be evaluated. Cancer treatments tend to deteriorate the nutritional condition, depending on the type of cancer and the established treatment, which increases mortality. The promotion of healthy habits that avoid the generation of reactive oxygen species, together with the ingestion of antioxidants as components of the diet, can lead to the proper oxidant/antioxidant balance and consequently to the prevention of cancer, as well as supplements already diagnosed with cancer. For malnourished patients immuno-nutrition shortened the hospitalization time, reduces post operative infections complications. Nutrition plays a fundamental role in cancer prevention, as well as in its progression and treatment. The microbiota plays a critical role in the performance of the functions of the gastrointestinal system, through the regulation of the inflammatory response and immune homeostasis. Restrictive, ketogenic diets must be supported by randomized, controlled, double-blind studies of excellence. At the time of implementation, remember that *Malnutrition* is the leading cause of death in cancer patients, and that the treatments and the tumor led to this situation.

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## Conflict of Interest

No conflict of interest.

## References

- Stephane SM, M Isabel T D Correia (2020) Epidemiology of weight loss, malnutrition and sarcopenia: A transatlantic view. *Nutrition* 69: 110581.
- WHO American Cancer Society. Oral Cavity and Oropharyngeal Cancer.
- Aoife M Ryan, Derek G Power, Louise Daly, Samantha J Cushen, Éadaoin Ní Bhuachalla, et al. (2016) Cancer-associated malnutrition, cachexia, and sarcopenia: the skeleton in the hospital closet 40 years later, Published online by Cambridge University Press, UK.
- Arends J, Strasser F, Gonella S (2021) Cancer cachexia in adult patients. *ESMO Clinical Practice Guidelines*, 6(3): 100092.
- Albert Barrocas (2019) Demonstrating de Value of the Nutritional support Team to the C-Suite in a Value-Based Environment: Rise or Demise of Nutrition Support Teams? *Nutrition in Clinical Practice* 34(6): 806-819.
- Fosam A, Rachel J Perry (2020) Current mechanism in obesity and tumor progression. *Curr Opin Clin Nutr Metab Care* 23(6): 395-403.
- Maria Cristina Gonzalez, Carla A Pastore, Silvana P Orlandi, Steven B Heymsfield (2014) Obesity paradox in cancer: new insights provided by body composition. *Am J Clin Nutr* 99(5): 999-1005.
- Ligibel Jennifer A, Bohlke Kari, May Anne M, Clinton Steven K, Demark-Wahnefried, et al. (2022) Exercise, Diet, and Weight Management during Cancer Treatment. *ASCO Guidelines Journal of Clinical Oncology* 40(22).
- Erin S Sullivan, Niamh Rice, Elaine Kingston, Aoife Kelly, John V Reynolds, et al. (2021) A national survey of oncology survivors examining nutrition attitudes, problems and behaviors, and access to dietetic care throughout the cancer. *Clinical Nutrition ESPEN* 41: 331-339.
- Detsky AS, McLaughlin JR, Baker JP, Johnston N, Whittaker S, et al. (1987) What is subjective global assessment of nutritional status? *JPEN J Parenter Enteral Nutr* 1987; 11: 8-13.
- Jens Kondrup, Henrik Højgaard Rasmussen, Ole Hamberg, Zeno Stanga (2003) Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials *Clinical Nutrition* 22(3): 321-336.
- Ottery FD (2000) Patient-Generated Subjective Global Assessment. In: McCallum PD, Polisea CG (eds.) *The Clinical Guide to Oncology Nutrition*. Chicago: The American Dietetic Association, USA, pp. 11-23.
- Gordon L Jensen, Tommy Cederholm, M Isabel T D Correia, M Christina Gonzalez, Ryoji Fukushima, et al. (2019) GLIM Criteria for the Diagnosis of Malnutrition: A Consensus Report from the Global Clinical Nutrition Community. *JPEN J Parenter Enteral Nutr* 43(1): 3240.
- Ljungqvist O, Scot M, KC Fearon (2017) Enhanced Recovery After Surgery: A Review. *JAMA Surg* 152(3): 292-298.
- Kaili Yu, Xiaoya Zheng (2020) Immunonutrition vs Standard Nutrition for Cancer Patients: A Systematic Review and Meta-Analysis (Part 1). 44(5): 742-767.
- Amiran Dzutsev, Romina S Goldszmid, Sophie Viaud, Laurence Zitvogel, Giorgio Trinchieri (2015) The role of the microbiota in inflammation, carcinogenesis, and cancer therapy. *Eur J Immunol* 45(1): 17-31.
- PW Parodi (2007) A Role for Milk Proteins and their Peptides in Cancer Prevention. *Curr Pharm Des* 13(8): 813-828.
- Devkota S, Wang Y, Musch MW, Vanessa L, Fehlner-Peach H, et al. (2012) Dietary-fat-induced taurocholic acid promotes pathobiont expansion and colitis in *Il10<sup>-/-</sup>* mice. *Nature* 487(7405):104-108.
- Amiran D, Romina SG, Sophie V, Laurence Z, Giorgio T (2015) The role of the microbiota in inflammation, carcinogenesis, and cancer therapy. *Eur J Immunol* 45(1):17-31.
- S Tynkkynen, KV Singh, P Varmanen (1998) Vancomycin resistance factor of *Lactobacillus rhamnosus* GG in relation to enterococcal vancomycin resistance (*van*) genes. *Int J Food Microbiol* 41(3): 195-204.
- Eiró N, Vizoso FJ (2012) Inflammation and cancer. *World Journal of Gastrointestinal Surgery* 4(3): 62-72.
- Brock T (2010) Inflammation in Cancer. *Cancer 2011 / Karin M, Greten F, y Grivennikov S, La inmunidad la inflamación y el cáncer*. Cellpress, 140(6).
- Josep M Argilés, Francisco J López-Soriano, Silvia Busquets (2019) Mediators of cachexia in cancer patient. 66: 1115.
- M A E de van der Schueren, A Laviano, H Blanchard, M Jourdan, J Arends, et al. (2018) Systematic review and meta-analysis of the evidence for oral nutritional intervention on nutritional and clinical outcomes during chemo(radio)therapy: current evidence and guidance for design of future trials. *Ann Oncol*. 29(5): 1141-1153.
- Santiago Olaechea, Anne Gilmore, Christian Alvarez, Bhavani S Gannavarapu, Rodney Infante, et al. (2022) Associations of Prior Chronic Use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and Glucocorticoids with Cachexia Incidence and Survival. Original research article. *Front Oncol, Pharmacology of Anti-Cancer Drugs*.
- Bozzetti F, Stanga Z (2020) Does Nutrition for cancer patients feed the tumour? A clinical perspective. *Crit Rev Oncol Hematol* 153: 103061.
- Laura K, Christine H, N O'Callaghan, AE LaVertu, Xinge D, et al. (2022) Evidence-based nutrition guidelines for cancer survivors in Europe: a call for action. *European Journal of Clinical Nutrition* 76: 819-826.
- Liam McKeever (2021) New implementations for the ASPEN clinical guidelines and a call for protocol review on the nutrition guidelines for adult head & neck cancer. 45(7): 1397-1399.

29. Eric J Roeland, Kari Bohlke, Vickie E Baracos, Eduardo Bruera, Egidio del Fabbro, et al. (2020) Management of Cancer Cachexia: ASCO Guidelines. *J Clin Oncol* 38(21): 2438-2453.
30. Martini J Sealy, Tanadech Dechaphunkul, Cees P van der Schans, Wim P Krijnen, Jan LN Roodenburg, et al. (2020) Low muscles mass is associated with early termination chemotherapy related to toxicity in patients with head and neck Cancer. *Clin Nutr* 39(2): 501-509.