

# Onco-surgery and nutrition in cancer patients

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**Abbreviations:** PHA, phyto hem agglutinin; PNI, prognostic nutritional index; PG-SGA, patient generated subjective global assessment; MST, malnutrition screening tool; MUST, malnutrition universal screening tool; MNA, mini nutritional assessment; SGA, subjective global assessment; BMI, body mass index; MUAC, mid upper arm thickness

## Editorial

The prevalence of malnutrition in hospitalized patients is to the extent of 40% on a worldwide basis.<sup>1</sup> Among cancer patients, due to the multiple catabolic changes and treatment effect, patient's nutritional status is progressively affected. Chemotherapy, radiotherapy and surgical treatments lead to side effects like nausea, vomiting, anorexia, esophagitis, dysphagia, diarrhoea and lethargy. This further deteriorates their nutritional status and the body enters the state of malnutrition.<sup>2,3</sup> During the phase of malnutrition the body is deficient of energy, protein and other important nutrients necessary to support

bodily functions.<sup>4</sup> Malnutrition leads to weight loss, muscle wasting, extracellular fluid volume expansion, sensitivity to fluid and salt overload, which further leads to delayed wound healing, morbidity, mortality, and increased cost of medical care.<sup>5</sup> Malnutrition results in lower immunity and therefore the stress response to trauma, injury and surgery is deranged.<sup>6,7</sup> According to literature, due to immune dysfunction lymphocyte response sensitivity to phyto hem agglutinin stimulation and macrophage passage inhibitory factor activity is declined in malnourished cancer patients. This further leads to slow cell regeneration, decline in protein synthesis and thymic atrophy.<sup>8-10</sup> In totality, the recommendation proposed for these cancer patients is to employ nutritional supplementation (in the form of oral, enteral, parenteral, total parenteral) -along with immune nutrition support in preoperative period.<sup>11</sup>

Prognostic nutritional index (PNI), patient generated subjective global assessment (PG-SGA), malnutrition screening tool (MST), malnutrition universal screening tool (MUST), mini nutritional assessment (MNA) are valid nutrition assessment tools used to assess cancer patients nutritional status.<sup>12-14</sup> PG-SGA is an adaptation of subjective global assessment (SGA), which, as well as incorporating three global ratings of nutritional status (well nourished, moderately or suspected of being malnourished and severely malnourished), includes a numerical score (0-35) and additional nutrition impact symptoms.<sup>15</sup>

Preoperative body mass index (BMI), percentage weight loss and hypoalbuminemia are important components of several malnutrition screening indices among cancer patients. Among malnourished colorectal cancer patients also these screening indices have shown increased association to length of hospital stay. While hypoalbuminemia (serum albumin <3.5g/L) was more accurate in predicting post operative morbidities.<sup>16</sup> Studies suggested that low hemoglobin levels were related to poor survival in patients with ovarian cancer. An inverse correlation between serum albumin and length of hospital stay among patients with gynecological cancer has

been shown.<sup>17</sup> Serum creatinine has shown significant correlation with body weight and with lean (fat-free) mass.<sup>18</sup> Level of muscle mass affects serum creatinine concentration, therefore it can be an indicators for muscle wasting in malnourished cancer patients.<sup>18</sup> Malnutrition status assessed using SGA tool has displayed close correlation with skin fold thickness, mid upper arm thickness (MUAC), and serum albumin in advanced cancer patients.<sup>19</sup> Gastrointestinal postoperative cancer patients with significant preoperative weight loss have reported lengthier hospital stay than their counter parts with no weight loss.<sup>1</sup> They also documented significant positive correlation between length of hospital stay and reinforcement of adequate post-operative adequate nutrition postoperatively.<sup>1</sup> Longer hospital stay was also associated to increased risk of post operative complications. Compared to well-nourished preoperative patients, malnourished showed a trend to experience more postoperative complications.<sup>1</sup> Another study on gastrointestinal cancer patients concluded that severely malnourished cancer patients (classified using SGA tool) had a longer length of hospital stay leading to an overall higher expenditure. This study in addition, revealed a close relationship between patient nutritional status and clinical outcomes.<sup>20</sup> A study on gynecological cancer patients assessing patient nutritional status and its relation with length of hospitalization showed more severely malnourished the patient was, the lower the levels of BMI, total skin fold thickness and serum albumin. They suggested that addressing malnutrition and poor quality of life may decrease patient length of hospitalization.<sup>21</sup>

Since surgery is associated with morbidity like infections and wound complications, which can increase length of hospital stay, it may be prudent to provide nutrition support during the perioperative period in these individuals. A sensible approach would be to implement protocols for oncology patients, which show nutritional screening, assessment, and intervention as appropriate.<sup>22</sup> It is recommended to delay surgery and imparting 10-14 days of pre-operative nutritional supplementation in hospitalized malnourished patients.<sup>23,24</sup> Correcting malnutrition may decrease the length of hospital stay and even

lower the rate of hospital readmissions in undernourished cancer patients. A recent meta-analysis on intervention studies focusing on malnourished preoperative surgical patients highlighted the importance of nutritional supplementation prior to surgery. Patients on nutrition support had improved prognosis to reduce postoperative infectious complication, non-infection complications and length of hospital stay than on standard treatment.<sup>11</sup> It has been earlier reported that colon cancer patients with more than 5% preoperative weight loss have experienced significantly higher incidence of anastomotic leakage<sup>25</sup> and over 15 % weight loss (in surgical oncological patients) experience severe postoperative complications.<sup>26</sup> Recently a randomized intervention control trial on surgical oncology patients with no symptoms of malnutrition was concluded. The patients consuming an isocaloric nutritional drink two weeks prior to surgery had less severe postoperative complication than the control group patients on daily diets.<sup>27</sup> Therefore, it is recommended to initiate nutritional supplementation in all surgical patients with treatment related weight loss history.

We conclude malnutrition remains a major issue for onco-surgical patients it requires appropriate assessment and optimization prior to a major onco-surgery. This requires a multi-disciplinary approach including clinical nutrition experts, peri-operative physician and surgeon.

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## Conflicts of Interest

None.

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