

ABSTRACT

Dietary management for gynecological cancer patients in an evidence-based approach: A Systematic Review

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BACKGROUND

- Malnutrition remains a common problem in cancer patients as a major cause of morbidity and mortality.
- Gynecological cancers are characterized by specific energy metabolism alterations, cancer and treatment related complications and symptoms such as anorexia which result in a cachexia syndrome and reduced patient quality of life (QoL) and survivorship.
- Dietary strategies that support and ensure maintenance of adequate intake and utilization of nutrients are likely to reduce the extent of malnutrition, cancer, treatment process-related malnutrition and their adverse events.
- Evidence-based dietary intervention before, during and after the conventional cancer treatment modalities and as a combination regime may significantly save life and improve quality of life of cancer patients.

OBJECTIVES

- This systematic review aimed at providing an evidence-based approach in dietary management for gynecological cancer patients.

METHODS

- A Systematic Review design was employed. PubMed, EMBASE, the Cochrane Library, Scopus, CINAHL, and ClinicalTrials.gov were searched in April 2021 to identify suitable studies on dietary management for gynecological cancer patients.
- The emerging evidence were summarized in thematic areas.

RESULTS

- Four thematic areas emerged; dietary management of gynecological cancer patients during pre- and post-operative (surgical) intervention, during chemo-and-radiotherapy, improving quality of life and survival time through dietary management of gynecological cancers, the therapeutic (anti-cancer) effect of diet on gynecological cancers.

Table 1. Dietary management of gynecological cancer patients during pre- and post-operative (surgical) intervention

Study	Study design	Intervention	Results
Mohammad et al. 2020	RCT	Intervention group (IG) received an intensive individualized dietary counselling with supply of oral nutritional supplements (ONS) at baseline (Day 1). This continued with telephone and home visit follow-up by dietitian (Day 3 and Day 6) vs control group (CG) that only received general nutritional counselling without supply of (ONS)	A significant weight changes between groups ($p < 0.001$), with 0.14% weight gain in IG and 1.3% weight reduction in CG was observed. Mean energy and protein intake of IG were higher compared to CG by +329 kcal/day and +12.2 g/day, respectively.
Billson et al. 2015	Systematic review of RCTs	Early oral feeding (EOF) (oral fluids in the first 24 hours, and solid foods on the following day of surgery) vs a 'traditional' oral feeding (TOF)	Most women in the early feeding group (14/18 studies) were able to resume eating solid food one day after surgery. Length of hospital stay (LOHS) for patients who received EOF was shorter compared to TOF
Aynaci et al. 2019	Cohort study	To recommend actions that can be applied to gynecologic surgery clinic to reduce the incidence of malnutrition after surgery.	Complications was observed to increase with the risk of malnutrition.
Gerardi et al. 2008	Case-control Based on a clinical pathway	A prescribed clinical pathway, including rapid diet advancement vs individual surgeon preference.	Patients who had rapid diet advancement had a significantly ($p = 0.014$) shorter median LOHS (7 vs 10 days, and lower median 30-days postoperative hospital cost (\$19,700 vs \$25,110, ($P = 0.028$).

Table 2. Dietary management of gynecological cancer patients during chemo-and-radiotherapy

Study	Study design	Intervention	Results
Sanchez et al. 2019	Cohort study	Nutritional status and change in body composition of locally advanced cervical cancer (LACC) patients throughout treatment.	From no malnutrition at diagnosis except 33.3% sarcopenic, and most overweight; by the end of treatment, 69% became clinically malnourished and 58% were sarcopenic, 62.8% became anemic and 34.5% had low albumin levels.
Muls et al. 2020	Systematic Review	Dietary habits before, during and after treatment in women with a gynecological malignancy.	Patients lost weight during treatment, but this was not long-lasting. Long-term results suggest that fat and protein intake increase significantly, but no correlation between symptoms and nutritional parameters.
Croisier et al. 2020	Systematic review of RCTs	Whether fiber modification in patients with gynecological cancer undergoing pelvic radiotherapy prevent or alleviate gastrointestinal side effects vs standard care, placebo, or no intervention.	Some positive trends regarding improvements in incidence and severity of diarrhea and bowel symptoms were observed.
Garcia-Peris et al. 2016	RCT	Prebiotic mixture vs placebo during abdominal radiotherapy (RT).	The number of bowel movements per day and monthly increased in both groups. The number of days with watery stool (Bristol score 7) was lower in the prebiotic group $p (3.3 \pm 4.4$ to $2.2 \pm 1.6)$.
Schmidt et al. 2020	Cohort study	A counseling service for integrative medicine concepts, including nutrition as an outpatient program.	78% of the patients noticed an improvement, 74% benefited from nutritional counseling.
Zorn et al. 2020	Controlled cross-over trial	Whether modified short-term fasting (MSTF) reduces the incidence of chemotherapy-induced toxicities and whether an initial ketogenic diet (KD) as fasting supportive diet reduces fasting-related discomfort.	A significantly fewer chemotherapy postponements post-MSTF, an indication of improved tolerance of chemotherapy. The KD as a fasting supportive diet neither reduced fasting-related discomfort nor improved compliance of our fasting regimen.
Henson et al. 2013	Systematic review	Effects of nutritional interventions for reducing gastrointestinal (GI) toxicity in adults undergoing radical pelvic radiotherapy.	A reduction in diarrhea was demonstrated with nutritional intervention (risk ratio (RR) 0.66; 95% confidence interval (CI) 0.51 to 0.87), but no significant weight change.

RESULTS

Table 3. Dietary management of gynecological cancer patients: Improving quality of life and survival time

Study	Study design	Intervention	Results
Zhang et al. 2019	Meta-analysis of RCTs	The effects of dietary advice in cancer patients who were malnourished or at risk of malnutrition vs the usual care in terms of mortality and quality of life (QoL).	Dietary counseling did not reduce mortality (RR = 1.11, 95%CI = 0.95 to 1.29) and body weight (WMD = 4.28 kg, 95%CI = -0.21 to 8.76 kg) but improved energy intake and QoL.
Maccio Et al. 2012	RCT	Megestrol acetate (MA) plus L-carnitine, celecoxib, and antioxidants (arm 1) vs MA alone (arm 2) with respect to lean body mass (LBM), resting energy expenditure (REE), Eastern Cooperative Oncology Group performance status (ECOG PS), C-reactive protein (CRP), interleukin (IL)-6, tumor necrosis factor (TNF)- α reactive oxygen species (ROS).	The combination arm was more effective than arm 2 with respect to LBM. REE, fatigue, and global QoL. Appetite increased, ECOG PS and inflammation and oxidative stress parameters IL-6, TNF- α , CRP, and ROS decreased significantly.
Oliveira et al. 2020	Cohort study	The association between nutritional status and quality of life (QoL) in incurable cancer patients in palliative care.	A high prevalence of nutritional risk (NR) (85.4%) and cancer cachexia (CC) (78.7%) were observed. Patients with worse nutritional status presented significantly poorer overall QoL.
Argefa and Roets 2021	Cohort study	The association between the nutritional status and survival of cervical cancer patients: The malnourished vs unmalnourished	Prevalence of malnutrition determined by PG-SGA was 17.7% at admission and 47.1% at the end of follow-up. One in three (29.7%) patients required nutritional intervention, higher risk of mortality among the malnourished (HR: 3.12, 95% CI: 1.23 - 7.86).
Rios et al. 2021	Cross-sectional study	Associations between quality of life (QoL) and nutritional status.	Poorer nutritional status was significantly associated with worsened physical, social, emotional and functional well-being QoL domains.
Gupta et al. 2009	Retrospective chart review	The impact of improvement in nutritional status on ovarian cancer survival:	Improvement in nutritional status is associated with better survival.

Table 4. Dietary management of gynecological cancer patients: The therapeutic (anti-cancer) effect of diet

Study	Study design	Intervention	Results
Sun et al. 2009	Systematic review	The potential of berberine, a plant-based alkaloid with a tetracyclic skeleton, as an alternative medicine for tumor chemotherapy	Berberine exhibited anti-inflammatory, antiproliferative, pro-apoptotic, and antimetastatic actions.
Min et al. 2014	Review	Anticancer effects and molecular mechanisms of epigallocatechin-3-gallate	Epigallocatechin gallate (EGCG), a polyphenol in green tea extracted from the leaves of Camellia Sinensis exhibits antiproliferative, antiangiogenic, antimetastatic, and proapoptotic properties.
Shafabakhsh et al. 2019	Review	The chemo-preventive and curative role of quercetin for ovarian cancer.	Quercetin, a plant flavonol, exhibited anti-inflammatory, pro-oxidative, antiproliferation, and apoptosis induction activities.
Karavasiloglou et al. 2019	Cohort study	Post-diagnostic "Healthy Eating Index" (HEI) and the "Mediterranean Diet Score" (MDS) vs unhealthy pattern in gynecological cancer survivors.	Higher HEI score was associated with lower mortality (HR = 0.97, 95% CI: 0.95-0.98, suggesting a protective effect.
Vahedpoor et al. 2017	RCT	Administered 50,000 IU vitamin D3 supplements vs Placebo.	Vitamin D intake led to significant reduction in serum insulin level and plasma malondialdehyde (MDA) level, elevation in quantitative insulin sensitivity check index, plasma nitric oxide (NO), total antioxidant capacity (TAC), and total glutathione (GSH).

CONCLUSIONS

- This study identified critical dietary interventions that can be implemented before, during and after the conventional cancer treatment modalities and as combination regimen to improve patient QoL and survival times.
- Appropriate dietary therapeutic protocols with effective psychological and social support are crucial for enhanced dietary management benefit.
- Key words:** Dietary management; Gynecological cancer; Evidence-based approach; Systematic Review.