

What is the effect of nutrition interventions on long term cardiovascular and metabolic parameters in cancer survivors and patients?

Danielle Brown, Bogda Koczwara, Michelle Miller
Flinders University and Flinders Centre for Innovation in Cancer (FCIC)

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Background

- Cancer survivors have increased risk of developing cardiovascular and metabolic conditions
 - Mechanism behind this increased risk is not clear, several different hypotheses
- Nutrition plays a key role in cardiovascular and metabolic illness prevention

Ref: Hooring et al. 2007, Maloney et al. 2008, Pass et al. 2008, Jensen 2008, Yeh & Buckford 2008, Lopez-Monreal et al. 2010, de Vos et al. 2004, Trowers & Johnson 2014, Szabo et al. 2007



Methods

Study design: literature review

Inclusion Criteria

- Cancer survivors or patients treated with curative intent.
- Intervention that involves changes to the participants dietary intake.
- Randomised or quasi-randomised controlled trial.
- Reports change in either a cardiac and/or metabolic outcome



Methods

Exclusion Criteria

- The intervention incorporates the use of medication.
- The nutrition intervention is administered via parenteral, enteral or intravenous means.
- The intervention is specifically targeted at cancer cachexia or malnutrition.
- Pilot or feasibility studies.
- The total length of intervention is <3 months.



Endpoints

- inflammation (CRP or interleukins),
- arterial stiffness, endothelial function,
- sympathetic nervous system function,
- blood lipids (HDL, LDL, triglycerides and/or total cholesterol),
- blood pressure,
- blood glucose levels,
- degree of insulin resistance,
- body composition (fat mass, muscle mass, lean body mass, muscle arm circumference, triceps skinfold waist circumference, hip circumference, waist/hip ratio, degree of weight loss/change or body mass index [BMI])

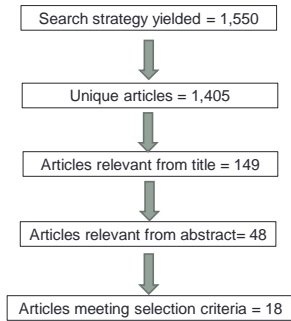


Methods

- Databases - Medline and Medline In Process, Scopus and CINAHL
- Filters - RCTs or articles, English language, humans
- Trials evaluated using the 'Quality Criteria Checklist for Primary Research' created by the *American Dietetic Association*
 - Checklist grades studies as either positive, neutral or negative quality
 - Aspects evaluated include: bias, comparability of groups, validity of outcome measures, statistical analysis



Results



Results- General Healthy Eating

Study	Design	Cancer type	Intervention	Endpoint	Significant for cardiometabolic endpoint	Quality grade
Hawkes et al. (2013)	n= 410 Parallel RCT	Colorectal cancer	Telephone delivered coaching sessions	Primary: PA, HRQoL, cancer-related fatigue Cardiometabolic: BMI	Yes	Neutral
Demark-Wahnefeld et al. (2007)	n=543 Crossover RCT	Breast and prostate cancer	Workbooks and newsletters	Primary: lifestyle behaviours Cardiometabolic: BMI, serum cholesterol	Yes	Positive
Demark-Wahnefeld et al. (2012)	n= 641 Parallel RCT	Breast, prostate and colorectal cancer	Personally tailored workbook, newsletters and telephone counselling	Primary: physical function Cardiometabolic: body weight, BMI	Yes	Neutral
von Gruenigen et al. (2012)	n= 75 Parallel RCT	Endometrial cancer	Group sessions	Primary: weight Cardiometabolic: body weight, waist circumference	Yes	Positive

Results – Energy Intake 1

Study	Design	Cancer type	Intervention	Endpoint	Significant for cardiometabolic endpoint	Quality grade
Chelebowska et al. (2006)	n= 2,437 Parallel RCT	Breast cancer	15% calories from fat	Primary: relapse free survival Cardiometabolic: BMI, weight	Yes	Neutral
Hebert et al. (2001)	n=199 3-arm parallel RCT	Breast cancer	20% energy from fat	Primary: diet and body mass Cardiometabolic: body mass	No	Positive
Mefferd et al. (2007)	n= 85 Parallel RCT	Breast cancer	Energy deficit of 500-1,000kcal per day	Primary: BMI, body composition, cholesterol Cardiometabolic: BMI, body composition, cholesterol	Yes	Neutral
Rock et al. (2001)	n=1,010 Select cohort of larger RCT	Breast cancer	20% energy from fat	Primary: body weight Cardiometabolic: body weight	Yes	Positive

Results – Energy Intake 2

Study	Design	Cancer type	Intervention	Outcome	Significant for cardiometabolic endpoint	Quality grade
Saqib et al. (2007)	n= 2,718 Sub analysis of a larger parallel RCT	Breast cancer	>30g/d fibre and 20% energy from fat.	Primary: body weight Cardiometabolic: body weight	Yes	Positive
Scott et al. (2013)	n= 90 Parallel RCT	Breast cancer	Reduce energy intake to 600kcal/day	Primary: body weight Cardiometabolic: body weight, waist circumference	Yes	Positive
Thomson et al. (2004)	n= 77 Ancillary study of a larger parallel RCT	Breast cancer	>30g/d fibre and 20% energy from fat	Primary: body weight, body composition Cardiometabolic: weight, body composition	Yes	Neutral
Villaini et al. (2012)	n= 96 Parallel RCT	Breast cancer	Energy deficit of 250kcal/day.	Primary: body weight Cardiometabolic: weight, body composition	Yes	Positive

Results – Individual Dietary Counselling

Study	Design	Cancer type	Intervention	Outcome	Significant for cardiometabolic endpoint	Quality grade
Kim et al. (2014)	n=56 Parallel RCT	Stomach cancer	Nurse partnered relationship with each participant involving a nutritional plan	Primary: nutritional and functional status Cardiometabolic: body weight, BMI, body composition	No	Positive
Loprinzi et al. (1996)	n= 109 Parallel RCT	Breast cancer	Dietitian counselling to maintain/lose bodyweight	Primary: body weight Cardiometabolic: body weight	No	Negative
Oversee et al. (1993)	n=137 Parallel RCT	Breast, ovarian and lung cancer	Dietitian counselling aiming to meet protein and energy requirements.	Primary: energy and protein intake Cardiometabolic: body weight, body composition	Yes	Neutral

Results – Supplements/extracts

Study	Design	Cancer type	Intervention	Outcome	Significant for cardiometabolic endpoint	Quality grade
Fortes & Novaes (2011)	n= 70 Parallel RCT	Colorectal cancer	Dried Agaricus sylvaticus extract equivalent to 30mg/kg/day	Primary: blood pressure Cardiometabolic: blood pressure, cholesterol, glucose	Yes	Neutral
Fortes, Silva & Novaes (2012)	n= 24 Parallel RCT	Colorectal cancer	Dried Agaricus sylvaticus extract equivalent to 30mg/kg/day	Primary: anthropometric measures Cardiometabolic: BMI, body composition	Yes	Negative
Algotar et al. (2010)	n= 140 Secondary analysis of a 3-arm parallel RCT	Prostate cancer	200µg or 800µg of selenized yeast per day	Primary: serum glucose Cardiometabolic: serum glucose	No	Neutral

Conclusions

- Modest evidence for impact of nutritional interventions on cardio-metabolic parameters after cancer
 - Most promising evidence is for the alteration of energy density
 - A general decrease of energy intake more effective than a focus of reducing fat intake.
 - limited generalisability as mostly breast cancer studies
- Limited use of outcome measures other than BMI
- Limited data on role of supplements

