Practical Issues in nutrition intervention in cancer patients

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Do we need to assess nutritional status in oncology patients? ....

- Malnutrition related to disease or treatment?...
- Difficulty swallowing?...
- Symptoms related to cancer treatment?...

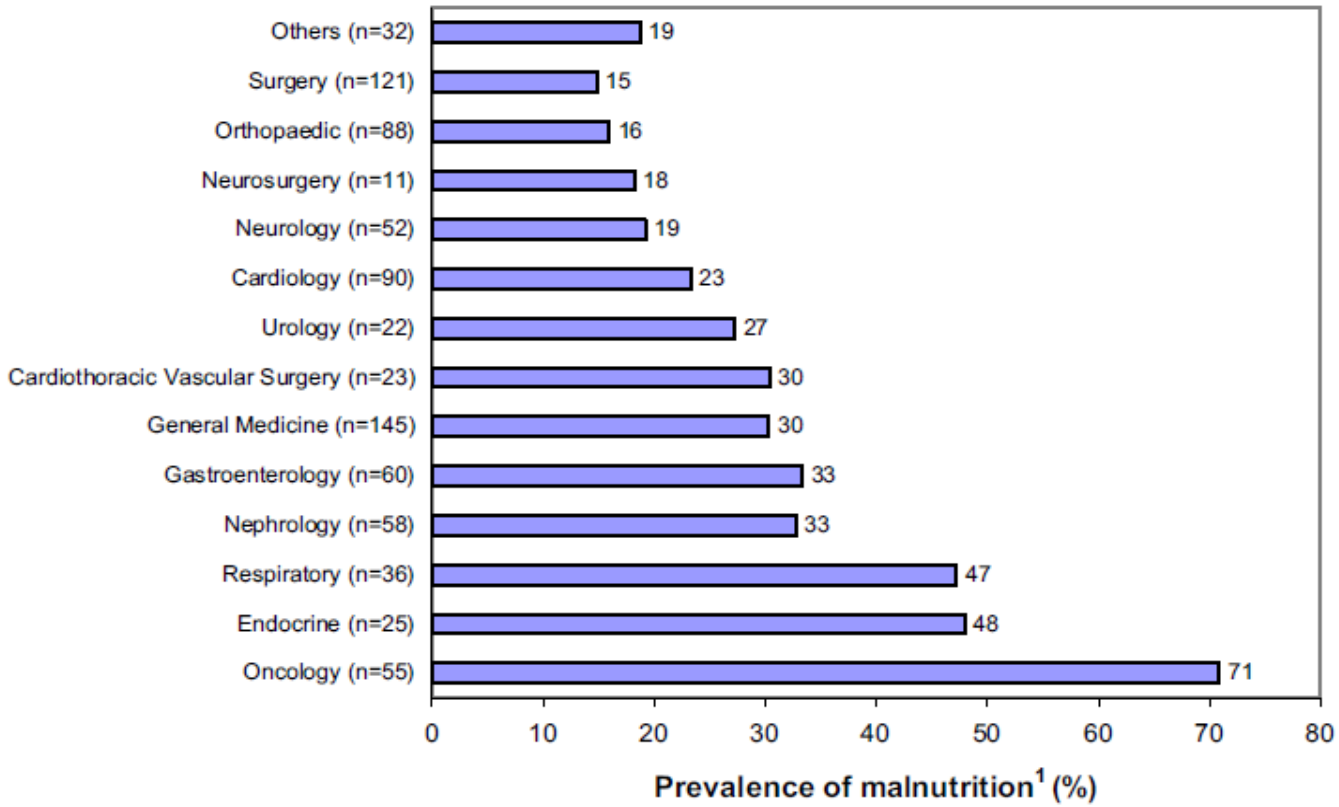
So, what do we do now?

Cancer and malnutrition

There is enough evidence that up to 40% of hospitalized patients with cancer are malnourished, this is associated with an increase in hospital length stay and morbidity

Hebuterne *JPEN* 2014

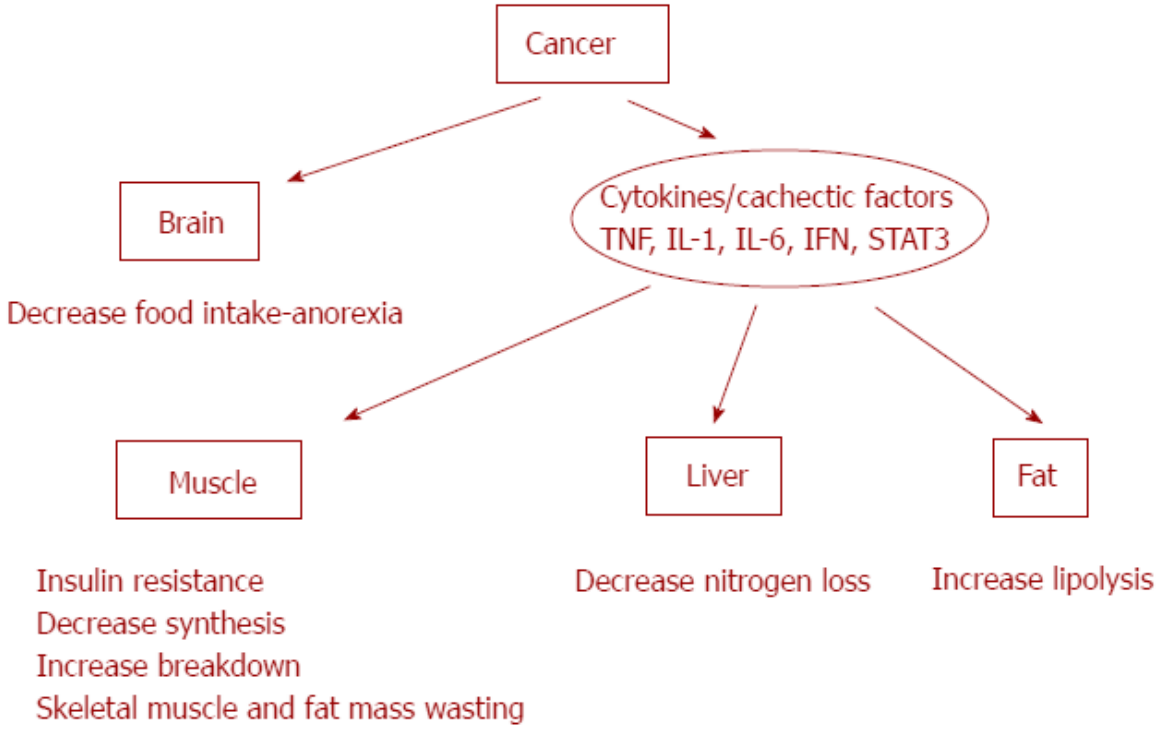
Prevalence of malnutrition



. Prevalence of malnutrition by specialties ($n = 818$). [1]Malnutrition was determined with Subjective Global Assessment within 48 h of hospital admission.

Lim S L, et al, Clinical Nutrition. 2012

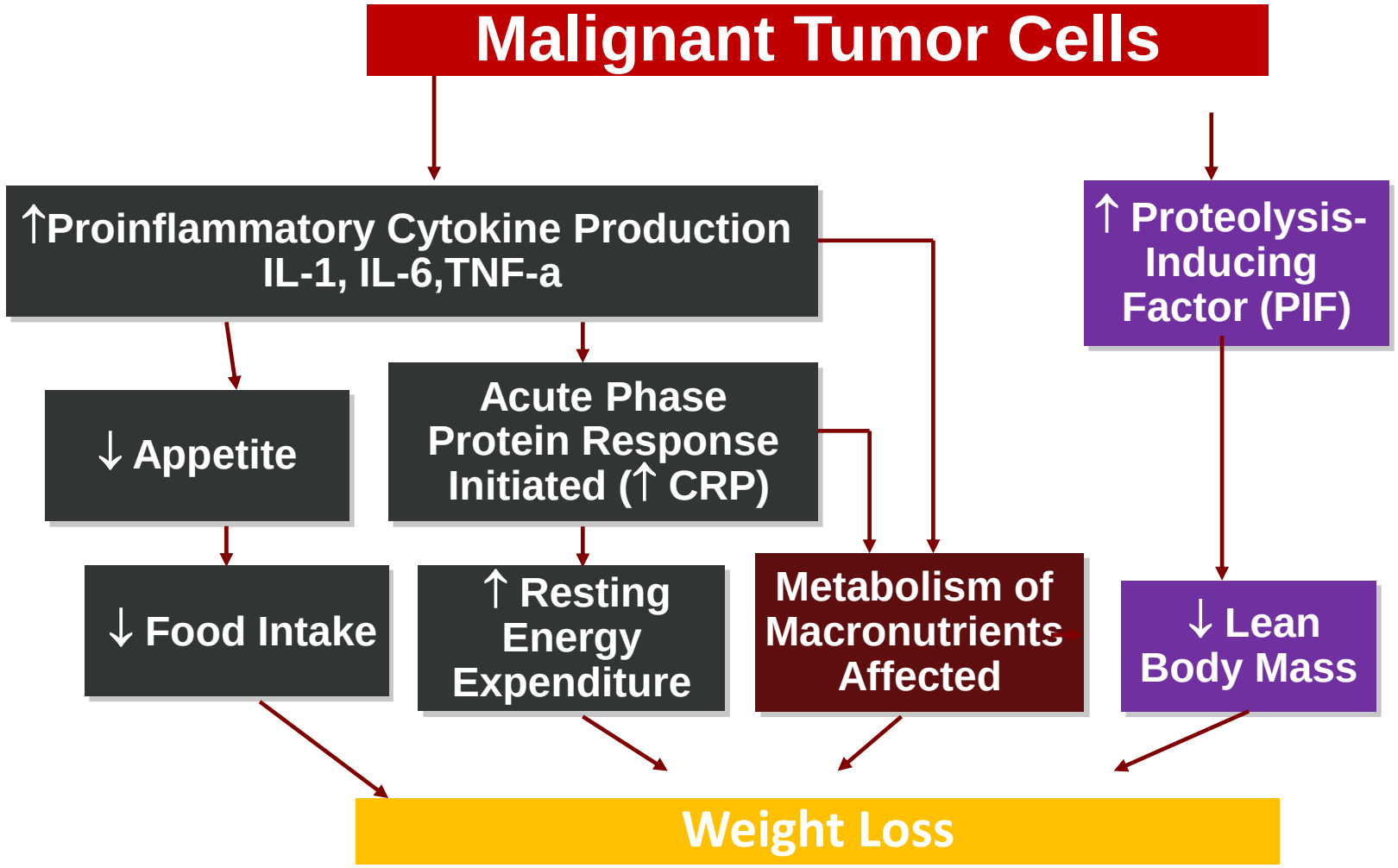
Metabolic changes in oncology patients



Role of tumor-induced systemic inflammation with metabolic pathways in organs affected by cancer cachexia.
IL: Interleukin; TNF: Tumor necrosis factor; IFN: Interferon; STAT3: Signal transducers and activators of transcription 3.

World J Gastrointest Oncol 2015 April 15; 7(4): 17-29

Impact of cancer cells in patients nutritional status



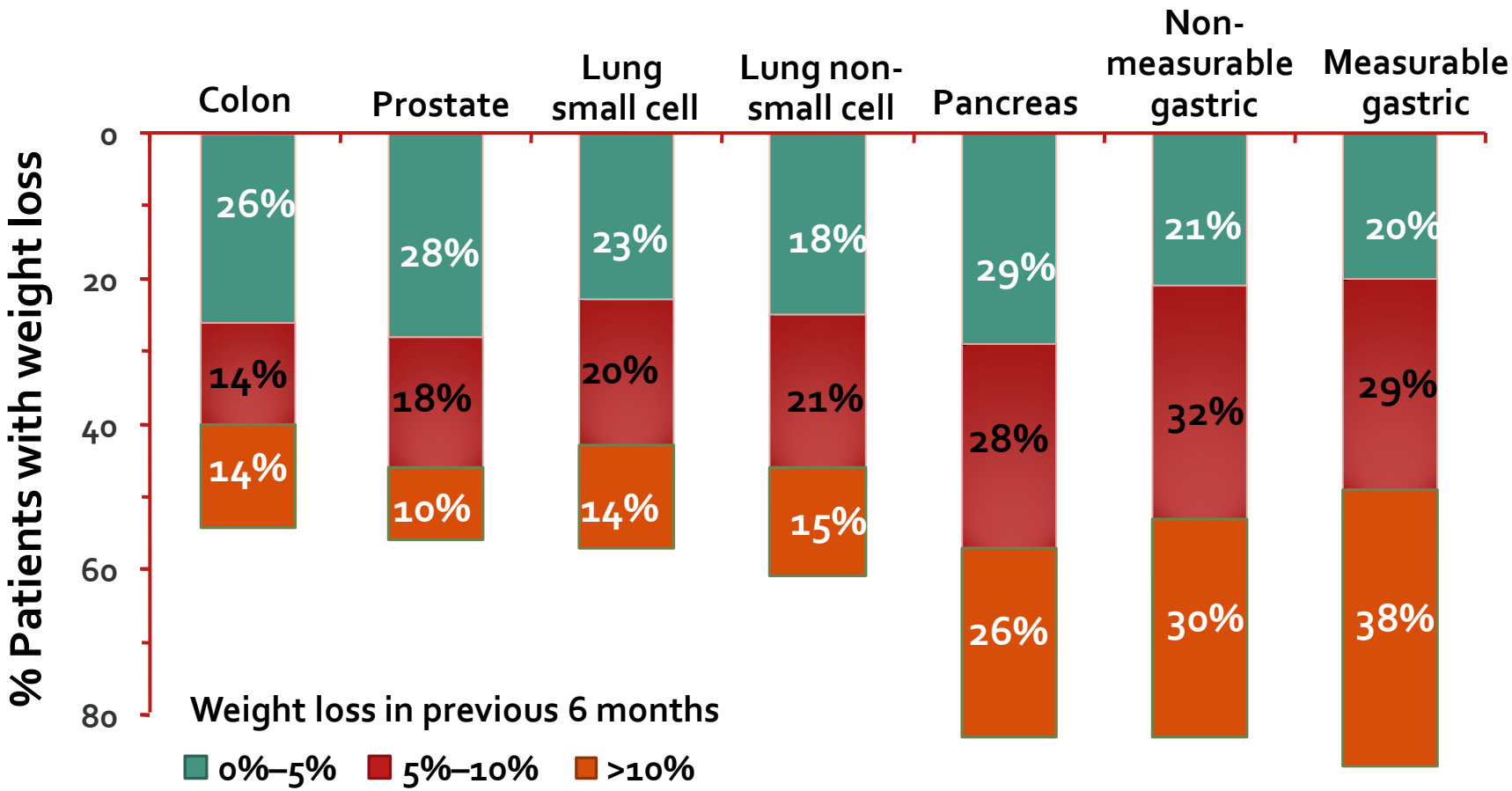
World J Gastrointest Oncol 2015 April 15; 7(4): 17-29

Cancer and malnutrition

- Up to 40% of cancer patients have unexplained weight loss at first diagnosis.
- 80% experience weight loss in advanced stages.
- More than 5% weight loss causes reduced response to therapy.

Olleinschlager, 1991
Kondrup, AJCN 2002
De Wys et al: *Am J Med* 1980:69:491.
Andreyev et al: *Eur J Cancer* 1998;34(4):503.

Frequency/severity of weight loss associated with cancer



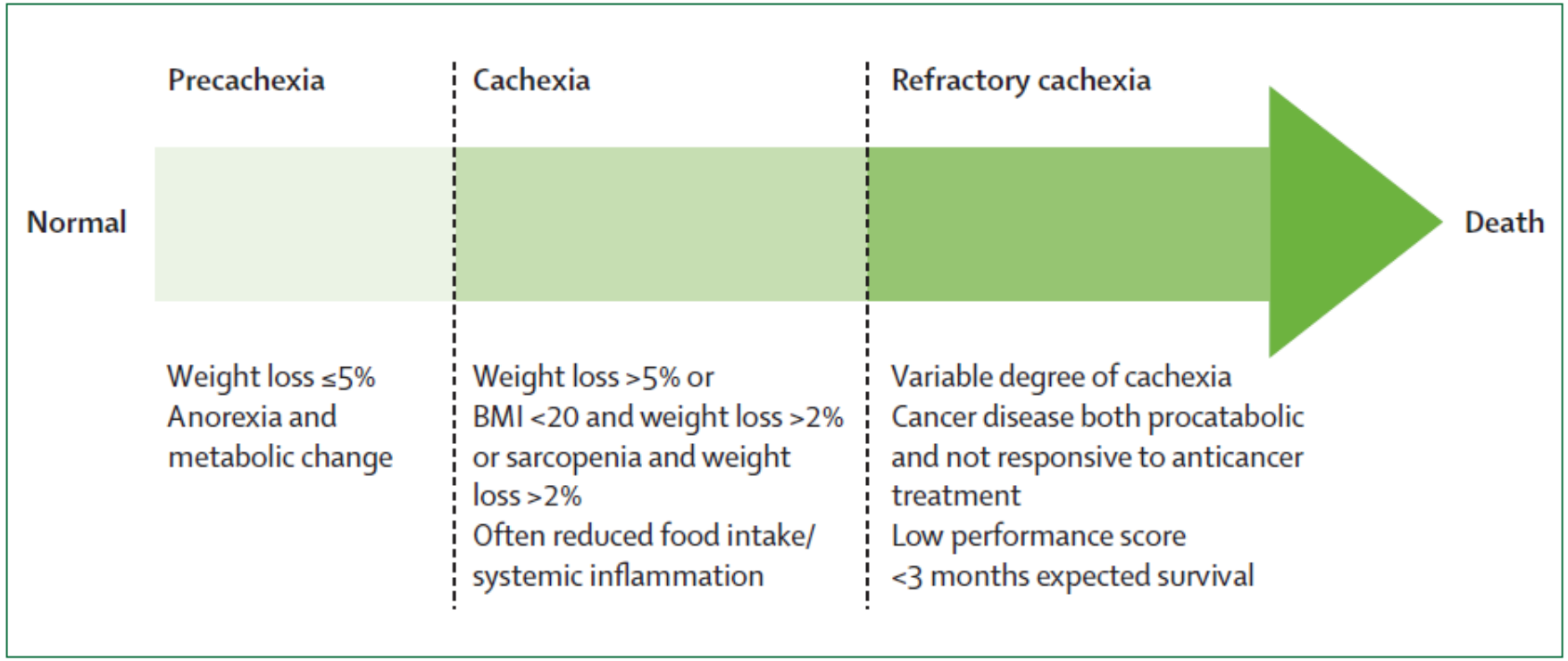
DeWys et al. Am J Med 1980;69:491.

Weight loss and poor nutrition status

- Is associated with morbidity outcomes and mortality:
  - Hospital admissions and readmissions
  - Hospitalary length of stay
  - Quality of life
  - Tolerance to RT and CT treatment
  - Mortality

Fearon K. 2011. *The Lan Onc* 12 (5) 489:495

Malnutrition or cachexia



- Up to 20% of cancer death

Fearon 2011, Defi nition and classifi cation of cancer cachexia: an international consensus

Clinical practice experience of a specielized clinical nutrition service in a public hospital in Mexico City

ASSESSMENT &

TREATMENT

2008

Was determined % of malnutrition.

Assessed:

- BMI
- Starvation
- Food intake
- LOS

Patients:

- Gastroenterology (%)
- Intensive therapy
- Neurology
- Oncology
- General Surgery
- Internal Medicine

ASSESSMENT

Nutrición Hospitalaria

Nutr Hosp. 2008;23(3):294-303
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Original

Estado nutricio en pacientes internados en un hospital público de la ciudad de México

V. Fuchs*, D. Mostkoff**, G. Gutiérrez Salmeán** y O. Amancio***

*Investigador. Hospital General de México. Unidad de Oncología y Apoyo Nutricio. Hospital ABC. **Universidad Iberoamericana. ***Hospital General de México y Facultad de Medicina. Universidad Nacional Autónoma de México. México.

Resumen

Objetivo: Determinar la frecuencia de desnutrición en los pacientes hospitalizados y relacionarla a su índice de masa corporal, ayuno, consumo de alimentos durante la estancia —nivel energético y proteico— y a los días de hospitalización.

Métodos (población de estudio, sujetos, intervención): Se evaluó la pérdida de peso en los últimos seis meses, el índice de masa corporal (IMC), los porcentajes de peso ideal y habitual, días de hospitalización, porcentaje de adecuación de alimento consumido (en kilocalorías y gramos de proteína), los días y razones del ayuno según fuera el caso en pacientes hospitalizados en diferentes servicios del Hospital General de México. Los pacientes se dividieron en grupos de acuerdo a su estado nutricio (con/en riesgo de desnutrición o normal) y se llevó a cabo un análisis descriptivo, así como diversas pruebas t para estimar la diferencia entre medias y comparar los dos grupos.

Resultados: Se evaluaron 561 pacientes. Se observaron diferentes frecuencias de desnutrición de acuerdo a varios indicadores: 21,17% de acuerdo al IMC, 38,07% y 19,57% por porcentaje de peso habitual e ideal respectivamente y una pérdida de peso en 69,57% de los pacien-

NUTRITIONAL STATUS IN HOSPITALIZED PATIENTS IN A PUBLIC HOSPITAL IN MEXICO CITY

Abstract

Objective: To determine the frequency of malnutrition among hospitalized patients and to relate nutrition status with body mass index, fasting time, adequacy intake of protein and energy during hospitalization and length of stay.

Methods (study population, subjects, intervention): We evaluated weight loss in the last 6 months prior to admission, body mass index (BMI), ideal and usual body weight percentages, days of hospitalization, energy and protein intake adequacy, fasting days and cause in hospitalized patients at different wards at Hospital General de Mexico. Patients were divided into groups according to their nutritional status (at risk/with malnutrition or normal) and data was assessed descriptively and comparatively by t-tests to determine mean differences.

2008

Potential Nutritonal Risks

Nutr Hosp. 2008;23(3):294-303
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Frecuencia de desnutrición de acuerdo a diversos indicadores

	n	%
Por IMC		
Desnutrición	119	21,17
Normal	186	33,09
Sobrepeso	155	27,58
Obesidad	101	17,97
Por pérdida de peso habitual		
Riesgo de desnutrición	214	38,07
Sin riesgo	347	61,74
Por % de peso ideal		
Riesgo de desnutrición	110	19,57
Sin riesgo	451	80,24
Por peso perdido		
Perdió peso	391	69,57
Sin cambio	63	11,21
Ganó peso	107	19,03

n = número de pacientes.

Just time for wait…

Generalidades de los hábitos dietéticos intrahospitalarios

	n	*% ajustado*
% de adecuación energético		
En riesgo	433	77,20
Sin riesgo	128	22,8
% de adecuación proteico		
En riesgo	497	87,9
Sin riesgo	68	12,1
Vía de administración de la dieta		
Oral	506	90,20
Enteral	22	3,92
Parenteral	8	1,43
Mixta	2	0,36
Ayuno	23	4,10
Motivo del ayuno durante su estancia		
Tratamiento (pre/post-quirúrgico, etc.)	86	33,73
Propios	39	15,29
Estudios clínicos	130	50,98
% de consumo de la dieta		
≤ 50%	106	19,31
60-70%	118	21,49
≥ 80%	325	59,20
Causa del consumo inadecuado		
Anorexia	124	33,60
Higiene	10	2,71
Monotonía	10	2,71
Sabor	36	9,76
Náusea	76	20,60
Horarios	11	2,98
Tristeza, soledad	69	18,70
Otros	32	8,67

n = número de pacientes.

Population 2008 Vs 2015

	2008 (N=303)		2015 (N=443)		
	Mean	SD	Mean	SD	p
Height	157.34	10.381	159.53	9.867	0.004
Weight	62.22	15.714	63.98	14.675	0.122
BMI	25.22	6.375	25.07	5.007	0.722
Usual Weight	68.63	30.523	69.45	17.164	0.669
Usual Weight (%)	93.47	14.947	92.91	11.237	0.578

Patients with cancer have the same pattern of weight loss despite the passing years so better strategies must be applied

Hospital General de México 2008-2015

2013

Nutrición Hospitalaria

Nutr Hosp. 2014;30(1):173-178
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Original / *Valoración nutricional*

Prevalencia de riesgo de desnutrición evaluada con NRS-2002 en población oncológica mexicana

Karolina Alvarez-Altamirano[1], Tania Delgadillo[2], Antonio García-García[3], Gabriela Alatriste-Ortiz[1] y Fuchs-Tarlovsky Vanessa[1]

[1]Servicio de oncología del Hospital General de México. México. [2]Universidad Autónoma de Sinaloa. [3]Dirección general de investigación del Hospital General de México. México.

NRS-2002 → Cancer patients → 40.5% with score +3

WEIGHT LOSS	NUTRITIONAL RISK (%)	NO RISK (%)
NONE	9.9	11.3
LOW	8.8	13.1
MEDIUM	9.7	0
HIGH	21.8	0

it's just a matter of time

OVARIAN CANCER

- Does not affect digestive system
- However nutritional status is affected

Nutritional deficiencies

- **Ovarian cáncer:**
  - Benign vs malign tumors affecting Body Composition in patients
  - 64 benign ovary tumour patients vs 56 malignant ovary cancer patients.
  - Measure of the following parameters: biochemical, anthropometric, body composition with the usa of DEXA, BIA and cutaneal folds.

Álvarez C, Hernández H, Oliva JC, Fuchs V

Body composition(benign vs. malignancy)

Variable	Malign n=56	Benign n=64	P
Weight	60.7 ± 11.7	63.7 ± 11.9	NS
BMI	26.1 ± 4.9	27.6 ± 4.4	NS
CM	14.8 ± 1.2	15.1 ± 0.9	NS
TCF	19.6 ± 7.7	25.5 ± 8.02	0.00**
% fat (anthropometric)	19.0 ± 7.4	41.7 ± 5.2	0.00**
% BIA	*28.4 ± 8.6	*32.6 ± 8.1	NS
% DEXA	*33.5 ± 9.3	*39.0 ± 6.8	0.07 NS

- n= 20 benignos
- n= 10 maligno

Prueba t-student muestras independientes **p > 0.05

Álvarez C, Hernández H, Oliva JC, Fuchs V

Biochemical data

Indicador	Tumor		P*
	Benigno n=35	Maligno n=23	
Proteínas totales	6.8 ±0.732	6.62 ±1.170	>0.241
Albúmina	3.951 ±0.568	3.396 ±0.733	<0.003
Transferrina	255 ±57.29	203.61 ±63.91	<0.008
Hemoglobina	13.16 ±1.78	12.17 ±2.16	>0.07
Hematocrito	38.91 ±4.8	36.47 ±5.8	>0.113
Leucocitos	7596.76 ±3490.51	6651.74 ±2917.97	>0.29
Linfocitos	2462.85 ±940.80	1971.70 ±1190.22	<0.055
CA-125	315.72 ±966.63	1163.42 ±1550	<0.000

426 Asia Pac J Clin Nutr 2013;22 (3):426-430

Original Article

Nutritional status and body composition are already affected before oncology treatment in ovarian cancer

Vanessa Fuchs-Tarlovsky PhD[1], Karolina Alvarez-Altamirano RD[2], Deborah Turquie-Sacal MSc, RD[3], Carolina Alvarez-Flores RD[3], Hellen Hernandez-Steller MSc[4]

[1]*Hospital General de Mexico, Oncology ward, Cuauhtémoc, Mexico*
[2]*Nuevo León Autonomus University, Nuevo Leon, Mexico*
[3]*Iberoamerican University, D.F., Mexico*
[4]*Nutritional Support Unit, San Juan de Dios Hospital, San José, Costa Rica, Mexico*

Ovarian cancer women had lower fat reserves by skin-fold thickness and lower serum proteins (albumin, transferrin, and lymphocytes) even though they were overweight.

2015

Clinical Nutrition Department*

- 43,731 inpatients were treated and assessed by the Clinical Nutrition Department in 2015.
  - Male: 41%
  - Female: 51%
  - Mean hospitalary length stay: 3.7 days

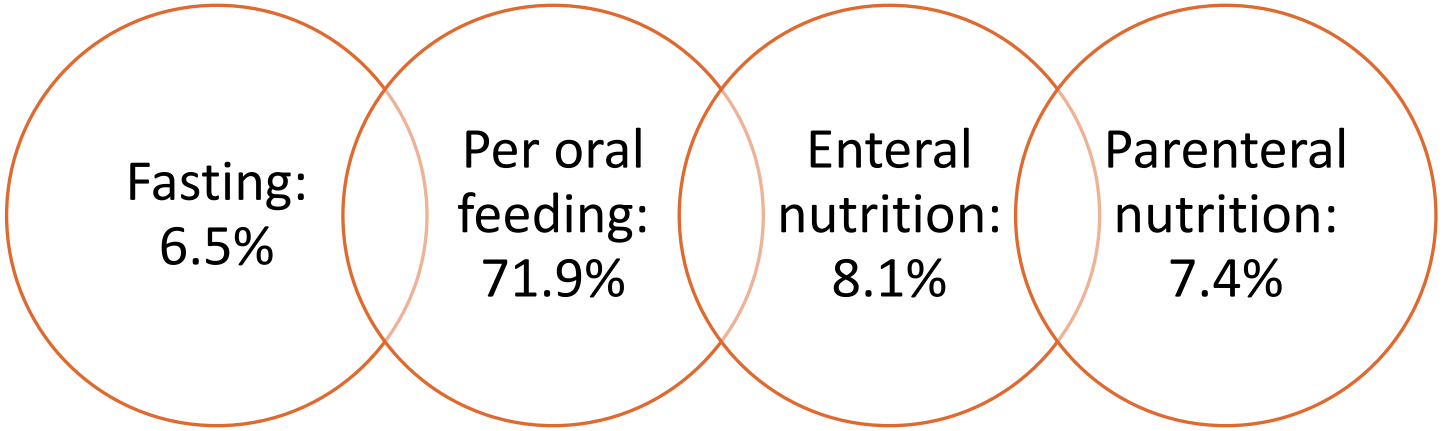
During the entire 2015, according to the NRS-2002 parameters, 21.4% of inpatients were at nutritional risk.

CURRENTLY MALNUTRITION IS A NOWADAYS ISSUE THAT CONTINUES TO PREVAIL IN THE HOSPITALARY BACKGROUND.

Hospital General de México, Statistic Report, 2015.

2015

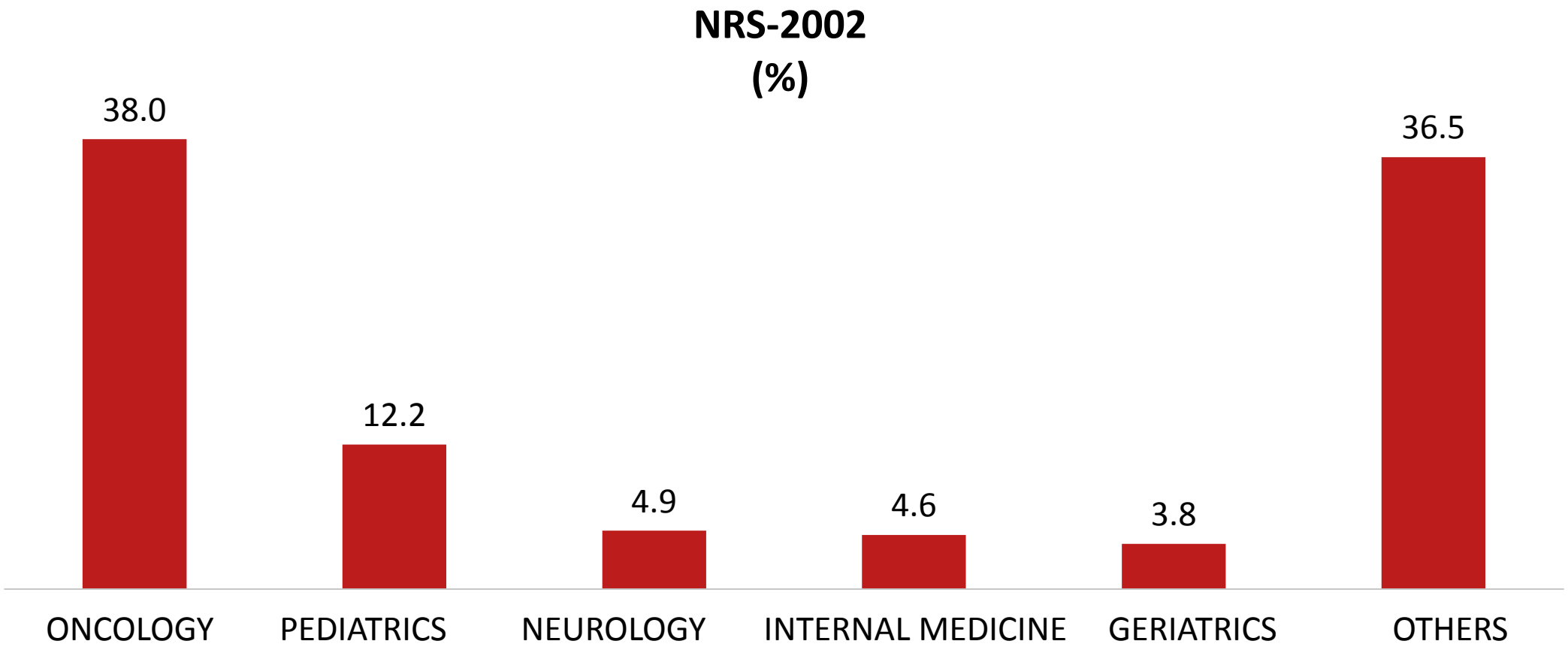
Comparative analysis



Per oral	Enteral Nutrition	Parenteral nutrition
Oncology (n=10320)	Neurology (n=1395)	Oncology (n=3593)
Internal Medicine(n=2261)	Oncology (n=562)	General Surgery Unit 307 (n=143)
Neurology (n=1786)	Internal Medicine (n=207)	General Surgery Unit 305 (n=139)
Infectology (n=1452)	Pediatrics (n=194)	Pediatrics (n=133)
Internal Medicine Unit 110 (n=1215)	Internal Medicine Unit 110 (n=191)	Infectology (n=130)

ASSESSMENT

2015



THERE IS AN INCREASING DEMAND FOR NUTRITIONAL CARE THERAPY IN THE HOSPITALS, INTERNAL MEDICINE AND GERIATRICS.

Hospital General de México, Statistic Report, 2015.

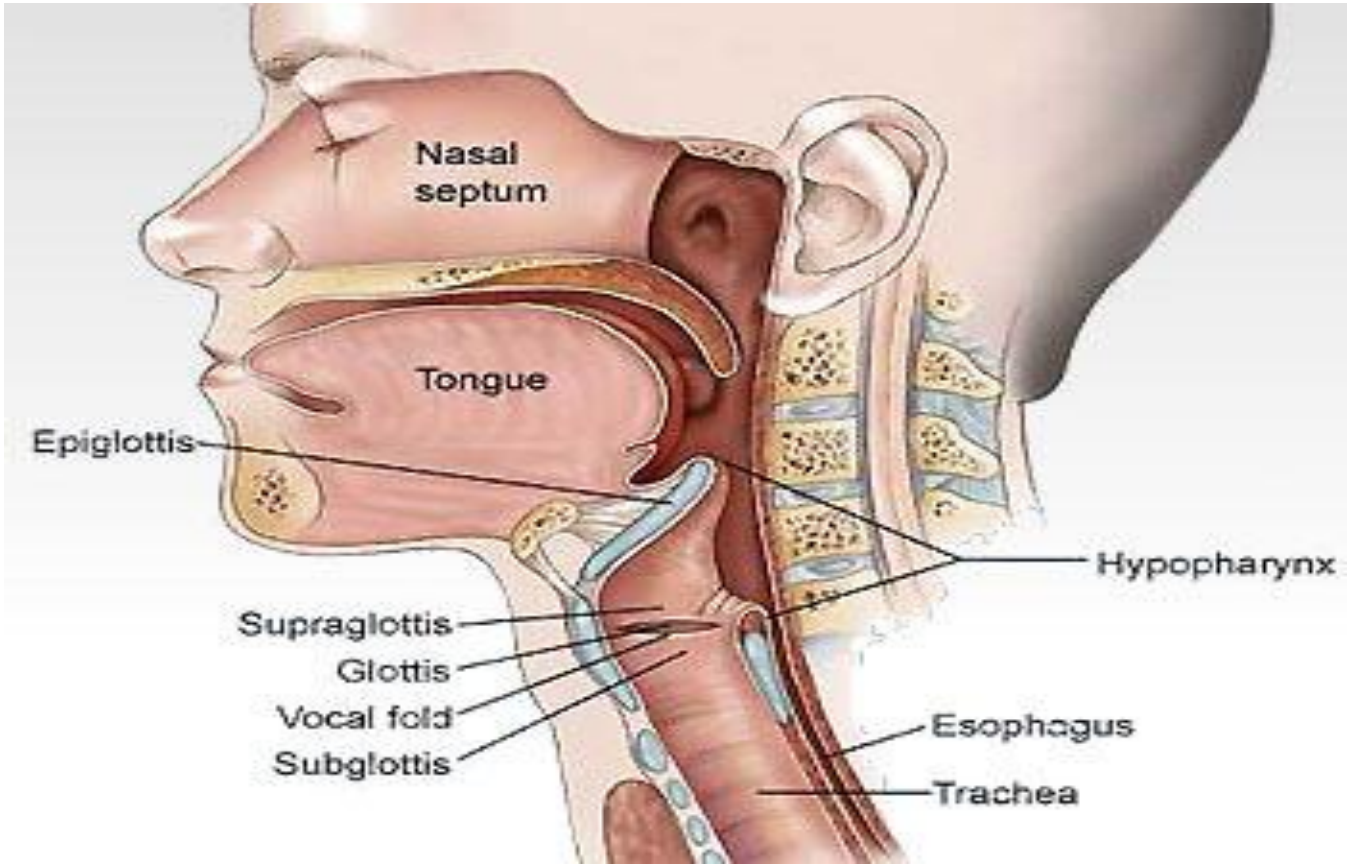
Nutritional assements

- Detect patients that neew nutritional support.
- Prevents deficiencies and excess in nutritional status which can affect the clinical evolution of inpatients.

SURGICAL PROCEDURES MODIFY THE NUTRITIONAL STATUS OF INPATIENTS; THIS MUST BE TAKEN INTO ACCOUNT TO PRESERVE THE INTEGRITY OF TISSUES, THE FUNCTIONAL REPAIRING PROCESSES AND THE PROGNOSIS OF INPATIENTS.

Head and neck cancer

- Regions which affection can imparir feeding
  - Nasal cavity.
  - Oral cavity.
  - Nasopharinx.
  - Oropharinx.
  - Larynx.



Nutrición Hospitalaria

Nutr Hosp. 2008;23(2):134-140
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Original

Evaluación del impacto de un tratamiento nutricional intensivo sobre el estado nutricional de pacientes con cáncer de cabeza y cuello en estadio III y IV

V. Fuchs, V. Barbosa, J. Mendoza, A. Vargas, O. Amancio, A. Hernández-Cuéllar y E. Arana-Rivera

Servicio de Oncología. Hospital General de México. México.

Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Head and neck cancer

General Objective

Assess the effect of intensive nutritional therapy in patients with head and neck cancer, stages III and IV (Antropometric/biochemical/dietetic data)

Patients: 41

Inpatients weight loss: 69.57%

Mean daily feeding parameters: **987.45±103.73 Kcal and 78.87±32.13 g of protein in averege.**

Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Methods

Cohort, comparative, experimental study design.

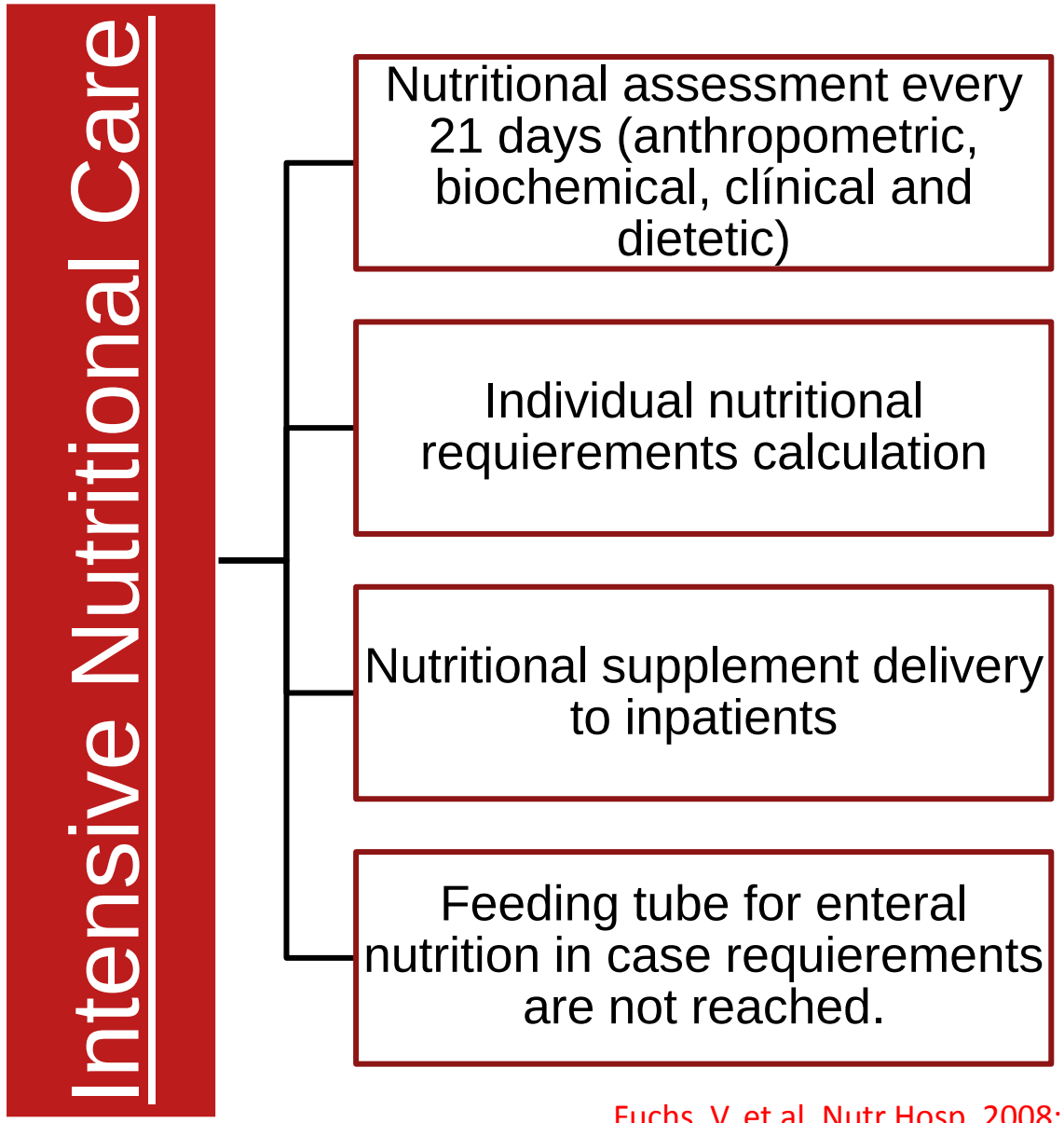
Conventional treatment

- Feeding advice (instructed by physician and/or nutse)
- Enteral nutrition feeding tube for the patiens with malnutrition
- Enteral nutrition

Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Methods

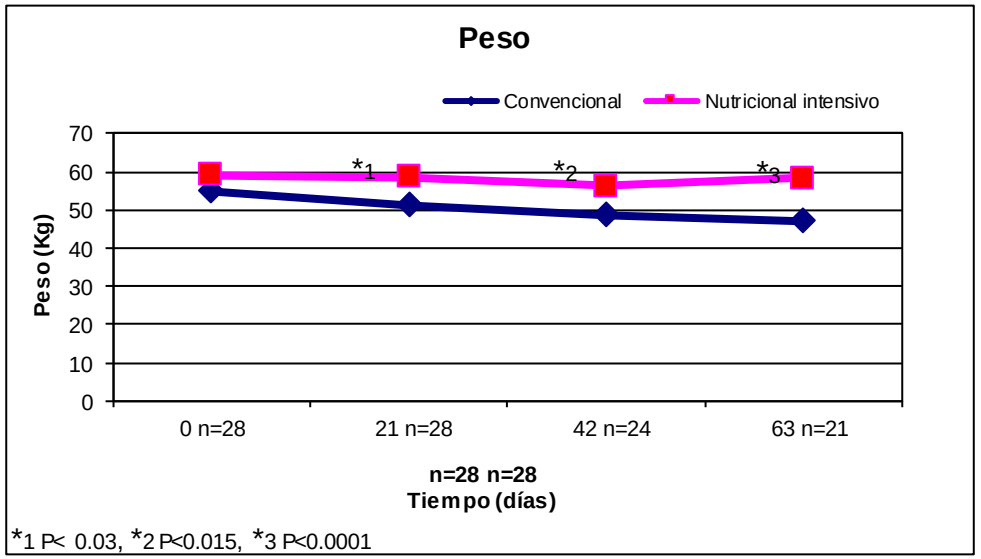
TREATMENT

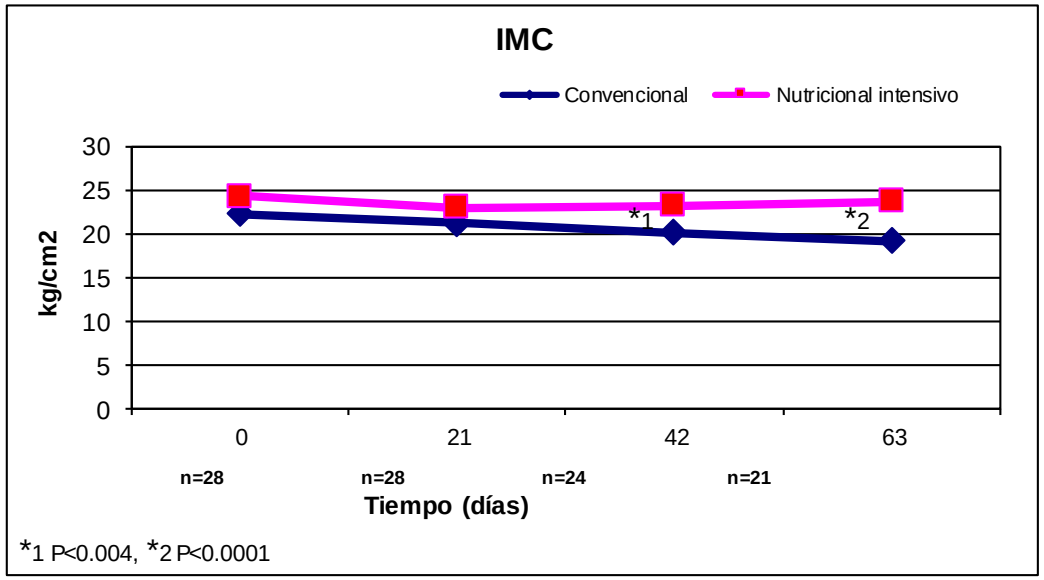


Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

TREATMENT

Anthropometric results





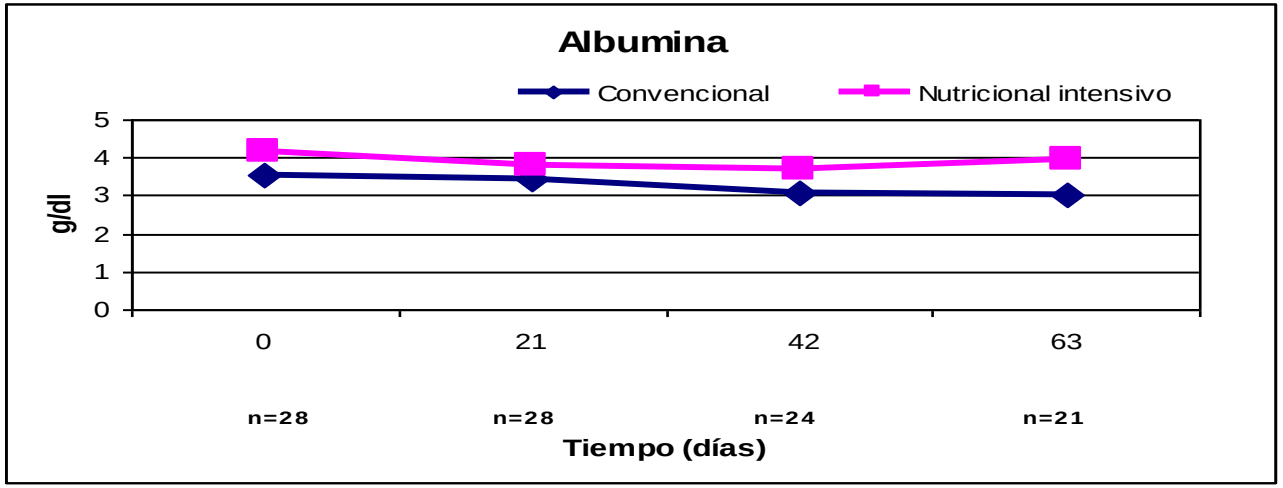
Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

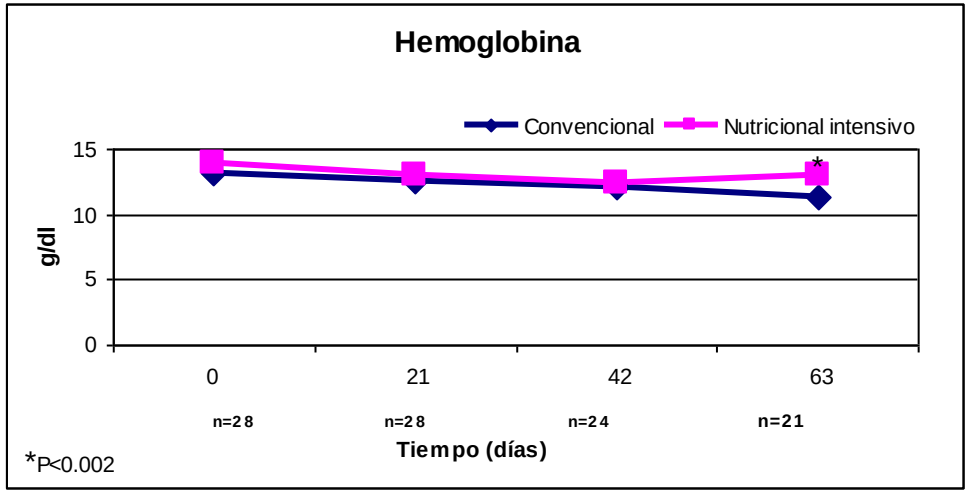
Anthropometric results

Parameters	Basal			21 days			42 days			63 days		
	TC (n=31)	TNI (n=22)	P*	TC (n=31)	TNI (n=22)	P*	TC (n=31)	TNI (n=15)	P*	TC (n=31)	TNI (n=11)	P*
Weight (kg)	50.27 ± 12.42	59.60 ± 14.31	NS	47.19 ± 9.60	59.14 ± 13.52	<0.015	44.9 ± 9.05	56.62 ± 12.89	<0.011	43.52 ± 8.98	58.02 ± 10.85	<0.001
BMI(Kg/m2)	21.01 ± 4.73	24.32 ± 4.77	NS	20.20 ± 3.20	22.98 ± 4.26	NS	19.12 ± 3.21	23.32 ± 4.26	<0.002	18.32 ± 3.04	23.73 ± 3.40	<.0.000
% Fat	21.14 ± 7.2	27.30 ± 11.24	<0.013	18.95 ± 7.5	26.67 ± 11.58	<0.004	17.2 ± 7.7	26.52 ± 11.26	<0.002	15.37 ± 7.5	29.50 ± 9.59	<0.000
ICC	0.89±0.86	0.89 ± 0.10	NS	0.88 ± 0.75	0.90 ± 0.10	NS	0.87 ±0.79	0.88 ± 0.83	NS	0.88 ± 0.77	0.88 ± 0.91	NS
% Usual weight	89.58 ± 9.98	87.65 ± 11.98	NS	86.53 ± 8.76	87.22 ± 13.08	NS	82.17 ± 8.74	87.15 ± 11.13	NS	79.22 ± 9.49	90.57 ± 9.36	<0.002
% Weight loss	10.10 ± 9.9	12.77 ± 13.08	NS	13.16 ± 9.0	12.34 ± 11.98	NS	17.25 ± 9.4	12.84 ± 11.1	NS	19.84 ± 10.5	9.4 ± 9.37	<0.008

Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Biochemical results





Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Biochemical parameters

PARAMETER	Basal		P*	21 days		P*	42 days		P*	63 days		P*
	TC (n=31)	TNI (n=22)		TC (n=31)	TNI (n=22)		TC (n=31)	TNI (n=15)		TC (n=31)	TNI (n=11)	
Hemoglobine	12.99 ± 1.55	13.95 ± 1.98	NS	12.50 ± 1.36	13.3 ± 1.94	NS	11.96 ± 1.67	12.42 ± 1.86	NS	11.61 ± 1.89	12.92 ± 1.56	NS
Hematocrite	37.51 ± 6.46	41.42 ± 5.83	<0.038	37.19 ± 4.16	39.98 ± 5.74	<0.055	36.20 ± 4.98	36.57 ± 5.50	NS	34.68 ± 5.49	38.41 ± 5.00	NS
Albumine	3.58 ± 0.63	4.1 ± 0.42	<0.000	3.36 ± 0.71	3.85 ± 0.45	<0.016	3.01 ± 0.73	3.7 ± 0.50	<0.004	2.95 ± 0.77	3.96 ± 0.50	<0.001
Total lymphocytes	2544.5 ± 1695.3	1700.91 ± 579.79	<0.027	2529.6 ± 1750.1	1475.45 ± 715.82	<0.007	2518.6 ± 1653.0	1098.62 ± 814.52	<0.002	2637.4 ± 1937.0	1134.55 ± 772.46	<0.014
ICT	61.0 ± 24.6	86.01 ± 34.9	<0.001	57.49 ± 22.3	95.49 ± 78.05	<0.010	58.23 ± 22.4	93.0 ± 30.83	<0.000	54.80 ± 20.90	86.49 ± 28.32	<0.000
Transferrine	258.6 ± 68.02	214.59 ± 72.95	<0.026	253.1 ± 64.39	221.76 ± 46.70	NS	244.0 ± 69.44	201.93 ± 41.1	<0.042	237.8 ± 71.20	237.6 ± 44.30	NS

Fuchs, V, et al. Nutr Hosp. 2008;23(2):134-140

Significant weight loss before oncology treatment is related to inflammation level and lean body mass reserves in head and neck cancer patients

- Objective: To compare inflammatory parameters, body composition and quality of life of patients with squamous cell head and neck cancer who had lost more than 10% of their body weight before starting cancer treatment with those who did not lose weight

Obed Solis Martinez, Yanelly Trujillo Cabrera, Arturo Hernández Cuellar, Gloria Eugenia Queipo Garcia , Vanessa Fuchs-Tarlovsky (Master Tesis)

Methodology

- Descriptive observational study
- Patients with head and neck cancer before starting their oncology treatments
- Levels of inflammatory cytokines TNF-α, IL-1β and IL-6 were measured
- Body composition & QOL
- Groups: weight loss of 10% before cancer therapy or with out it.

Outcomes

Table 3: Proinflammatory cytokines

Variable	*Total population n=79*	*Percent weight loss*		*p*
		<10% (n=43)	*>10% (n=36)*	
CRP (mg/dL)	31.35 ±51.21	30.40 ±57.06	32.45 ±44.19	0.862
TNF-α	153.46 ±182	111.30 ±170.40	203.83 ±185.04	0.023*
IL-1β	84.47 ±189.13	38.57 ±138.12	139.29 ±226.15	0.017*
IL-6	271.93 ±317.35	190.72 ±319.66	398.64 ±289.90	0.012*
IFN-γ	188.95 ±321.47	191.57 ±395.15	185.83 ±207.16	0.938

TNF-α:tumor necrosis factor alpha,IL-1β: interleukin 1-beta and IFN-γ: interferon gamma. PCR: C reactive protein. Equalvariances assumed. * t-Student test; p<0.05

Outcomes

Table 4: Body composition

Element	*Total population n=79*	*Percent weight loss*		*p*
		<10% (n=43)	*>10% (n=36)*	
Usualweight (Kg)	68.08 ±13.39	70.16 ±12.48	65.61 ±14.18	0.134
Weightloss (Kg)	9.51 ±9.44	4.99 ±2.58	14.91 ±11.65	0.000*
Current weight (Kg)	59.04 ±13.15	64.76 ±11.16	52.22 ±12.16	0.000*
IMC (Kg/m^2)	22.88 ±5.18	25.15 ±3.81	20.16 ±5.34	0.000*
Fat mass (Kg)	18.55 ±6.70	19.57 ±6.22	17.33 ±7.12	0.140
Fat free mass (Kg)	40.33 ±9.99	44.88 ±8.74	34.89 ±8.66	0.000*
Phase angle (°)	5.74 ±1.29	5.92±1.17	5.52 ±1.41	0.175

IMC: body mass index. Not equal variances are assumed: Fat free mass. * t-Student test; p<0.05

Outcomes

Table 1: Blood chemistry

Variable	*Total population*	*Percent weight loss*		*p*
	n=79	*<10% (n=43)*	*>10% (n=36)*	
Lymphocytes (# x10e3/uL)	1.68 ±0.67	1.77 ±0.59	1.56 ±0.75	0.179
Leukocytes (x10e3/uL)	8.79 ±4.94	8.56 ±5.50	9.06 ±4.23	0.660
Erythrocytes (x10e6/uL)	4.58 ±0.64	4.70 ±0.58	4.43 ±0.70	0.653
Hemoglobin (g/dL)	13.70 ±1.86	14.10 ±1.78	13.23 ±1.86	0.040*
Hematocrit (%)	41.60 ±5.57	45.57 ±5.23	40.45 ±5.81	0.092
Platelets (x10e3/uL)	266 ±94	255 ±91	279±98	0.262

Not equal variances are assumed to: Leukocytes and hemoglobin. * t-Student test; $p<0.05$

Outcomes

- There are important differences in inflammatory parameters and in lean body mass reserves between patients who lost weight and those who did not, pervious to oncology treatment.

- Weight loss should be evaluated in every patient and a nutritional tailored treatment should start as soon as possible in those patients who lost weight

Effect of eicosapentaenoic acid on body composition and markers of inflammation in patients with head and neck cancer

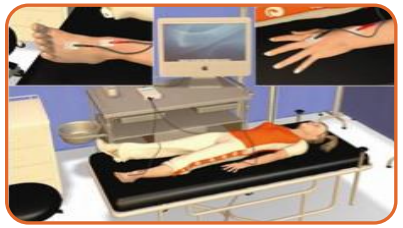
- **Objective:** The main objective of the assignment, was to evaluate the effects of the eicosapentaenoic acid towards the corporal composition and inflammatory markers in patients diagnosed with head and neck tumors that were submitted to antineoplastic treatment

Tesis de Maestría: Obed Solís Martínez,
Escuela Superior de Medicina, Instituto Politécnico Nacional, 2016

Methods and Materials:

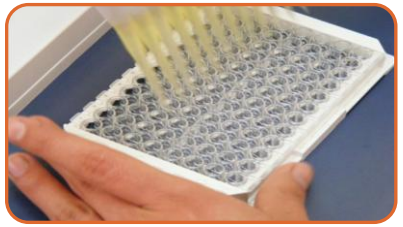
- A controlled clinical trial was conducted, in which patients with head and neck cancer were administered with a 2 gram dose of eicosapentaenoic acid during a period of 6 weeks, doing so approximately 15 days before beginning the antineoplastic treatment (surgery, radiotherapy, chemotherapy, or mixed treatment)

Methods and Materials:



Body composition

- Weight (BMI)
- Weightloss
- The bioimpedance JRL Quatium IV system



Inflammatory markers

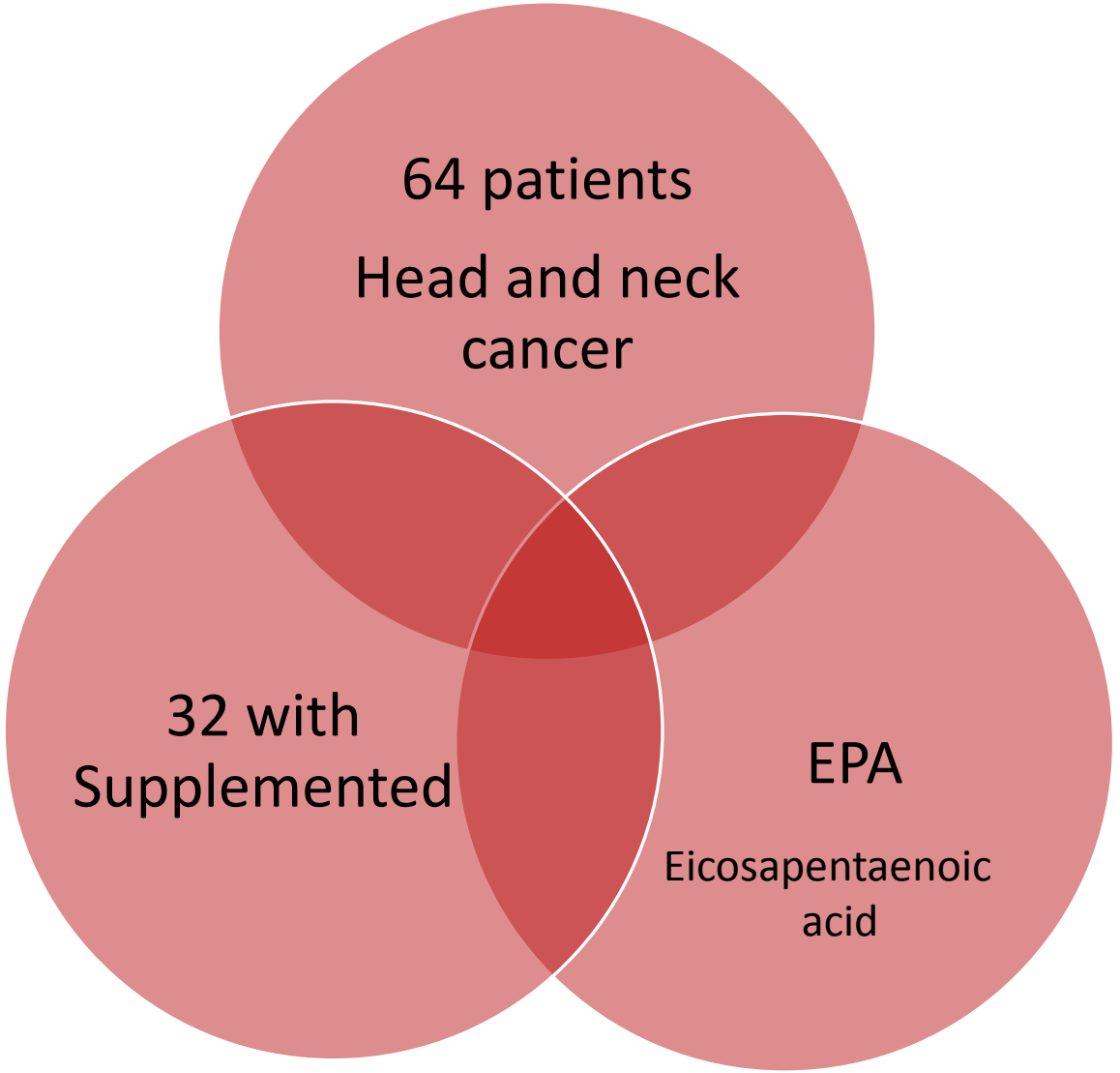
- Elisas technique with the Bio-Rad PRO HU-CYTO 17-PLEX

Quality of life

- Evaluated with the questionnaires which were validated by The European Organisation for Research and Treatment of Cancer (EORTC): QLQ-C30

TREATMENT

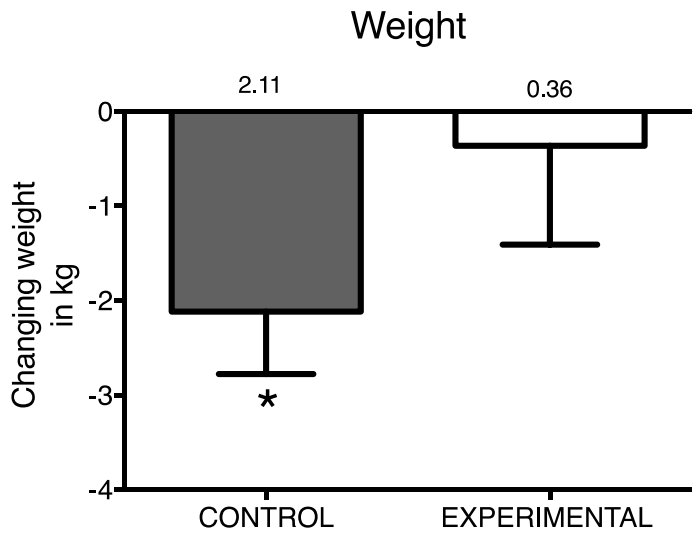
Results

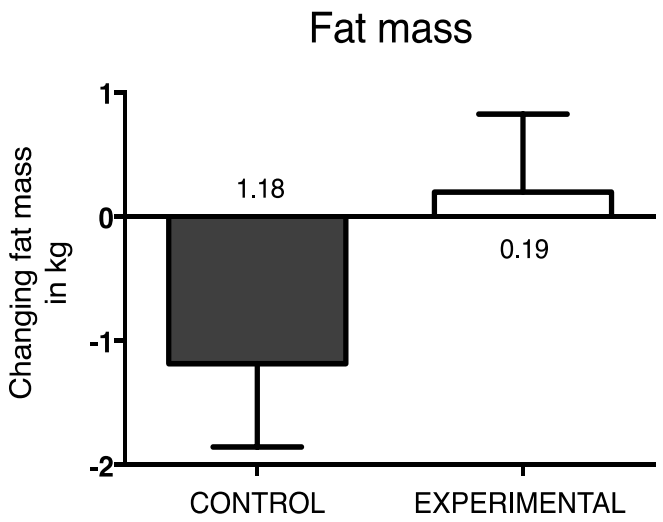


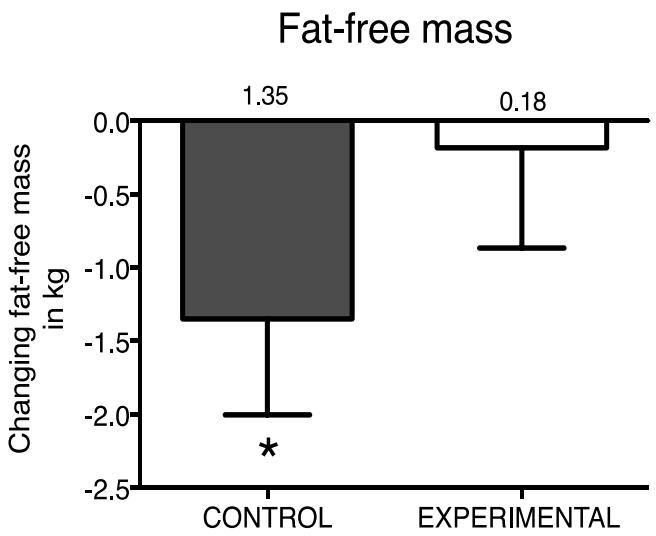
Tesis de Maestría: Obed Solís Martínez, Escuela Superior de Medicina, Instituto Politécnico Nacional, 2016

TREATMENT

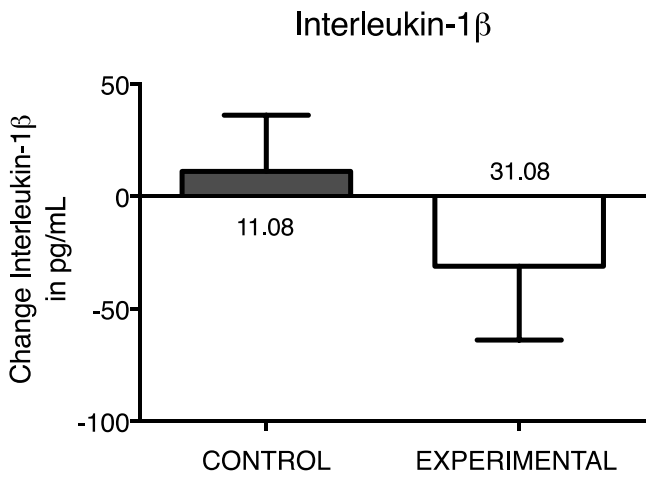
Results:

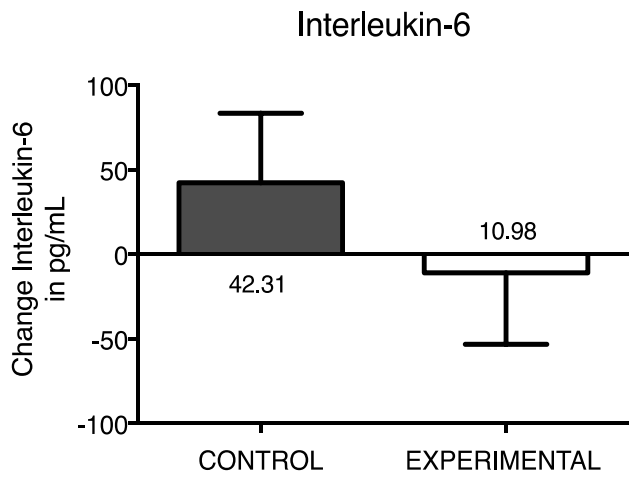


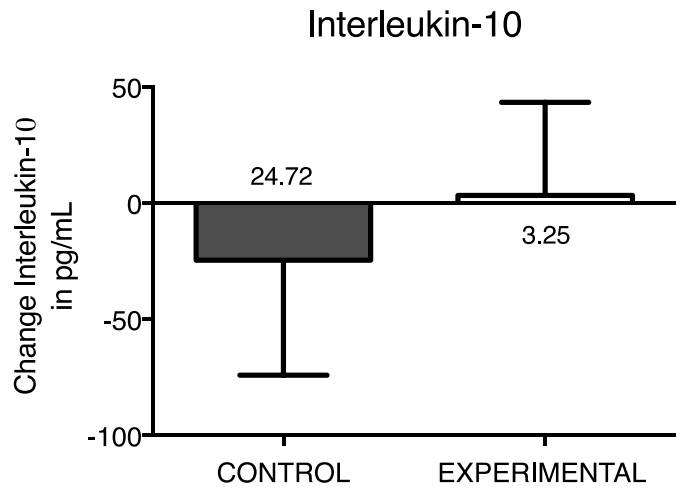


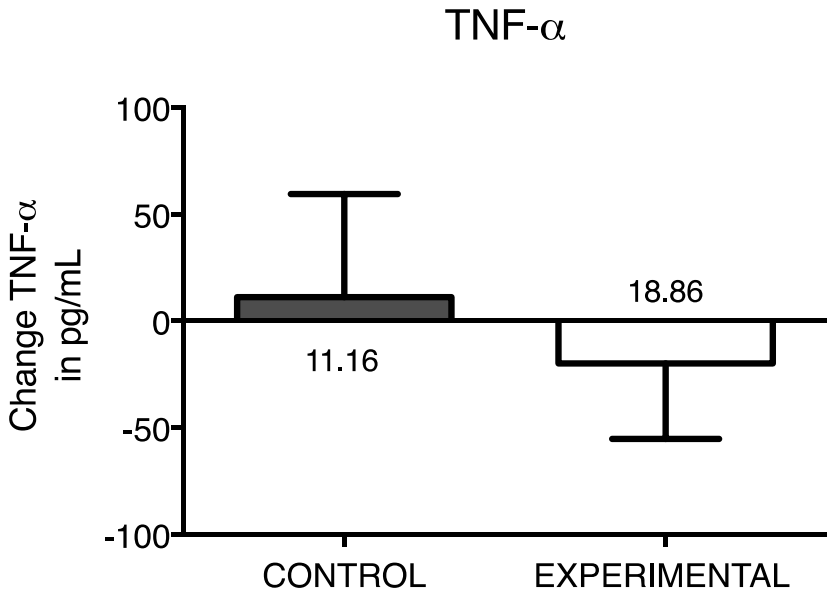


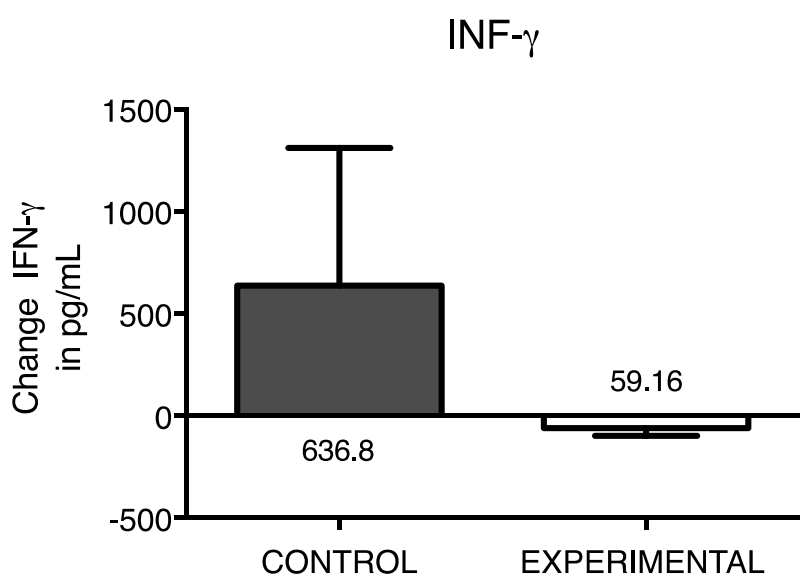
Inflammatory markers





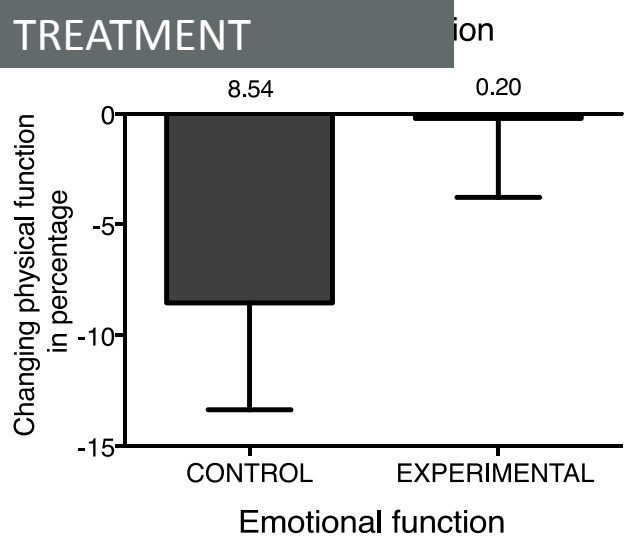


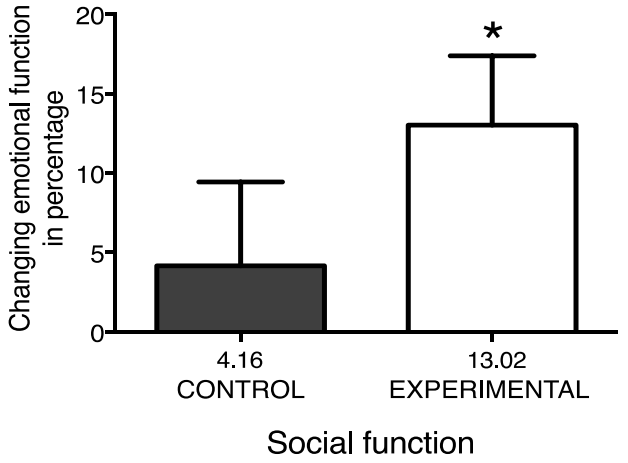


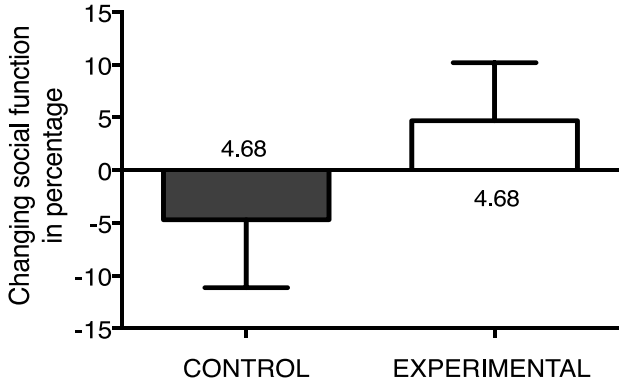


Tesis de Maestría: Obed Solís Martínez, Escuela Superior de Medicina, Instituto Politécnico Nacional, 2016

TREATMENT







Tesis de Maestría: Obed Solís Martínez,
Escuela Superior de Medicina, Instituto Politécnico Nacional, 2016

Outcome

EPA SUPLEMENTATION

modulating pro-inflammatory cytokine synthesis

IL-1β, IL-6, IFN-γ y TNF-α.

EPA SUPLEMENTATION

Improving the inflammatory state

IL- 10

EPA SUPLEMENTATION

Maintains fat and weight free mass was intact

Improvement in their QOL.

Tesis de Maestría: Obed Solís Martínez, Escuela Superior de Medicina, Instituto Politécnico Nacional, 2016

Support Care Cancer
DOI 10.1007/s00520-012-1674-6

ORIGINAL ARTICLE

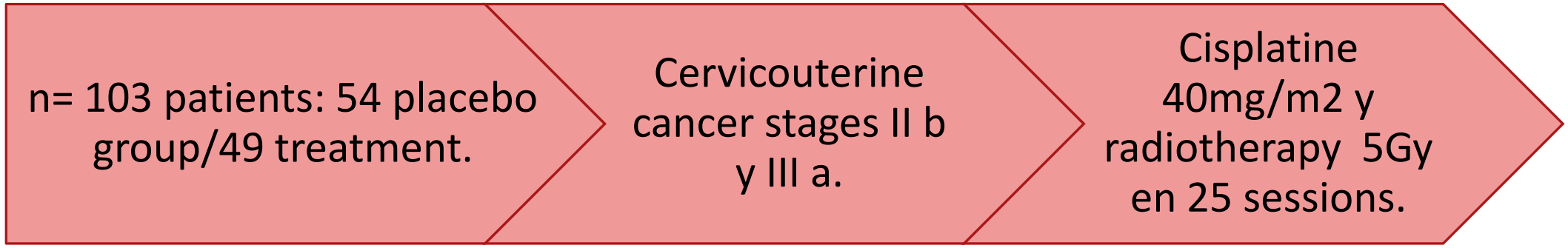
Antioxidant supplementation has a positive effect on oxidative stress and hematological toxicity during oncology treatment in cervical cancer patients

Vanessa Fuchs-Tarlovsky · María Amanda Casillas Rivera · Karolina Alvarez Altamirano · Juan Carlos Lopez-Alvarenga · Guillermo Manuel Ceballos-Reyes

Received: 20 July 2012 / Accepted: 26 November 2012

Abstract
Background and aim Hematological toxicity and oxidative stress are common in cancer patients. Antioxidant supplementation has been shown to decrease oxidative stress, but there is still controversy on this topic. The aim of this study was to determine the effect of antioxidant supplementation on oxidative stress, hematological toxicity, and quality of life (QoL) in cervical cancer patients.
Methods Randomized, single-blinded controlled trial in women with cervical cancer treated with radiotherapy and chemotherapy with cisplatin. Subjects were randomly quality of life questionnaire was applied before and after oncology treatment. Student's *t* test for independent samples and X^2 for categorical variables were performed.
Results One hundred three patients were randomly assigned to receive treatment with antioxidants 49 (48 %) or placebo 54 (52.40 %). At the end of the oncology treatment, hemoglobin levels were maintained, and global QoL was better only in the supplemented group ($p<0.025$).
Conclusions Antioxidant supplementation in patients treated with chemotherapy and radiotherapy apparently decreased oxidative stress, maintained hemoglobin levels,

Antioxidant supplementation with oncology therapy (Cysplatin)



Placebo VS suplementados con antioxidantes:

4.80 mg de B-caroteno, **200 mg de vitamina C**, 200 UI de vitamina E, 50 mg de selenio y 15 mg de Zinc.

Support Care Cancer (2013) 21:1359–1363

Table 1 Analysis of variables of oxidative stress before and after cancer treatment

Oxidative stress markers	Placebo initial mean±SD $n=54$	Placebo final mean±SD $n=54$	p	Suplemented initial mean±SD $n=49$	Suplemented final mean±SD $n=49$	p	p INTERGROUP
MDA (nmol/mL)	8.29±6.4	10.65±11.3	0.10	12.05±8.7	14.75±12.3	0.14	0.16
Carbonyls (nmol/mL)	84.60±67.3	126.8±143.7	0.06	91.26±68.7	75.85±57.9	0.25	0.000*
Carbonyl/mg protein (mmol)	1.5±1.4	2.53±3.1	0.05*	1.55±1.4	1.41±1.6	0.65	0.003*

*$P<0.05$

Table 2 Hematologic variables between placebo and supplemented groups before and after cancer treatment

Blood count variables	Placebo initial mean±SD $n=54$	Placebo final mean±SD $n=54$	p	Supplemented initial mean±SD $n=49$	Supplemented final mean±SD $n=49$	p	p INTERGROUP
Lympocytes (X 10^3 U/mm^3)	1.95±0.86	0.61±0.99	0.000*	1.78±0.86	0.46±0.23	0.000*	0.487
Eritrocytes (g/dL)	4.60±0.56	3.86±0.46	0.000*	4.46±0.36	4.03±0.41	0.000*	0.990
Hemoglobin (g/dL)	13.13±1.49	11.62±1.36	0.000*	13.31±1.35	12.50±1.22	0.04*	0.003*
Hematocrite (%)	37.73±5.02	33.86±3.78	0.000*	38.83±3.44	36.49±2.03	0.000*	0.004*
Platelets (X 10^3 U/mm^3)	301.28±76.61	240.98±65.52	0.000*	318.89±91.97	255.46±81.34	0.000*	0.379

*$P<0.05$

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Nutrición Hospitalaria

Nutr Hosp. 2011;26(4):819-826
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Original

Efecto de la suplementación con antioxidantes sobre el estrés oxidativo y la calidad de vida durante el tratamiento oncológico en pacientes con cáncer cérvico uterino

V. Fuchs-Tarlovsky[1,2], M. Bejarano-Rosales[1], G. Gutiérrez-Salmeán[2], M.ª A. Casillas[3], J. C. López-Alvarenga[1] y G. M. Ceballos-Reyes[2]

[1]Servicio de Oncología y Dirección de Investigación. Hospital General de México. [2]Escuela Superior de Medicina. IPN. [3]Iberoamerican University. Mexico City. México.

Resumen

Introducción: **En México el cáncer cérvico uterino representa un grave problema de salud pública. El tratamiento depende de su extensión; para los estadios iniciales, cirugía y para los localmente avanzados combinación**

EFFECT OF ANTIOXIDANT SUPPLEMENTATION OVER OXIDATIVE STRESS AND QUALITY OF LIFE IN CERVICAL CANCER

Abstract

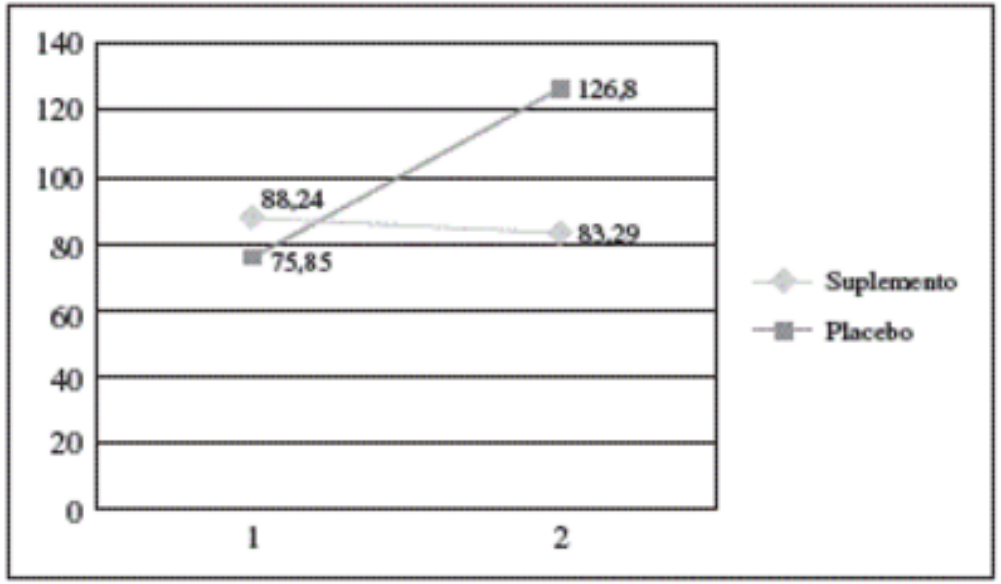

Fig. 1.—Modificación de la tasa de carbonilos séricos a lo largo del estudio en ambos grupos.

- Antioxidant supplementation reduced oxidative stress mainly at the level of protein, did not affect food intake.
- Quality of life was better in the supplemented patients.

Nutr. Hosp. vol.26 no.4 jul./ago. 2011

Nutrición Hospitalaria

Nutr Hosp. 2011;26(4):819-826
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Original

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Resumen

Introducción: **En México el cáncer cérvico uterino representa un grave problema de salud pública. El tratamiento depende de su extensión; para los estadios iniciales, cirugía y para los localmente avanzados combinación de quimioterapia con cisplatino y radioterapia. Ambas terapias producen estrés oxidativo a nivel celular. Todo este proceso afecta el consumo de antioxidantes naturales y la calidad de vida.**

Objetivo: **Conocer el efecto que tiene la suplementación con antioxidantes (β-caroteno, vitamina C y vitamina E)**

EFFECT OF ANTIOXIDANT SUPPLEMENTATION OVER OXIDATIVE STRESS AND QUALITY OF LIFE IN CERVICAL CANCER

Abstract

Background: **Mexico has a high rate of cervical cancer which represents an important public health issue. The treatment for this disease depends on the extension of the tumor; for the initial stages surgery is recommended, and for locally advanced tumors, a combination of chemotherapy and radiotherapy is used. All this process affects nat-**

Antioxidant supplementation during oncology treatment has no effect on cervical cancer recurrence

La suplementación con antioxidantes durante el tratamiento oncológico no tiene efecto sobre la recurrencia de cáncer cervicouterino

Karolina Álvarez-Altamirano[1], Alma Nubia Mendoza-Hernández[2], Carolina Carcoba-Tenorio[3], José Antonio García-García[1] and Vanessa Fuchs-Tarlovsky[1]

[1]Hospital General de México. [2]Facultad de Nutrición. Universidad Popular Autónoma del Estado de Puebla. Puebla. México. [3]Universidad Anahuac del Norte. Huixquilucan. México

Abstract

Introduction and aim: Antioxidant therapy with chemotherapy and radiotherapy in cervical cancer patients is controversial. While some evidence suggests that the use of antioxidants diminishes side effects from anticancer therapy, there is also data to suggest that antioxidants increase the risk of recurrence by affecting oncology treatments.

Methods: We conducted a controlled clinical trial in cervical cancer patients supplemented with an antioxidant mixture or a placebo during four years after their antineoplastic treatment was completed and the effect on recurrence. We also conducted data on used hemoglobin and albumin levels. Differences between groups were analyzed using chi-square test. Survival was calculated by the Multivariate COX regression with omnibus test and the enter method.

Results: 103 treated patients were in clinical stages IIB and IIIB of cervical cancer, 48% (n = 49) of the patients were treated with antioxidant supplementation and 52% (n =54) of the patients were in the placebo group. Of the original 103 patients, were able to follow up on 88 patients for an additional four years. 23.9% (n = 21) of the patients presented cancer recurrence and 76.1% (n = 67) did not, 21.6% (n = 19) patients showed metastasis. 8% (n = 7) patients were in the antioxidant group and 15.9% (n = 14) were in the placebo group ($p > 0.05$).

Regarding implications of cancer survivors, antioxidant supplementation apparently seems not to have interference with recurrence in cervical cancer patients but there is not enough evidence to prove it. A different dosage may have the expected effect; however, further studies with another dosage and criteria are necessary.

Conclusions: Supplementation with antioxidants during treatment of cervical cancer has no effect on cancer recurrence after 4 years of follow-up.

Key words:

Cervical cancer.
Recurrence.
Antioxidant supplementation.

Antioxidants during antineoplasic treatment dis not affect recurrence in cervical cancer

Recurrence

23.5%

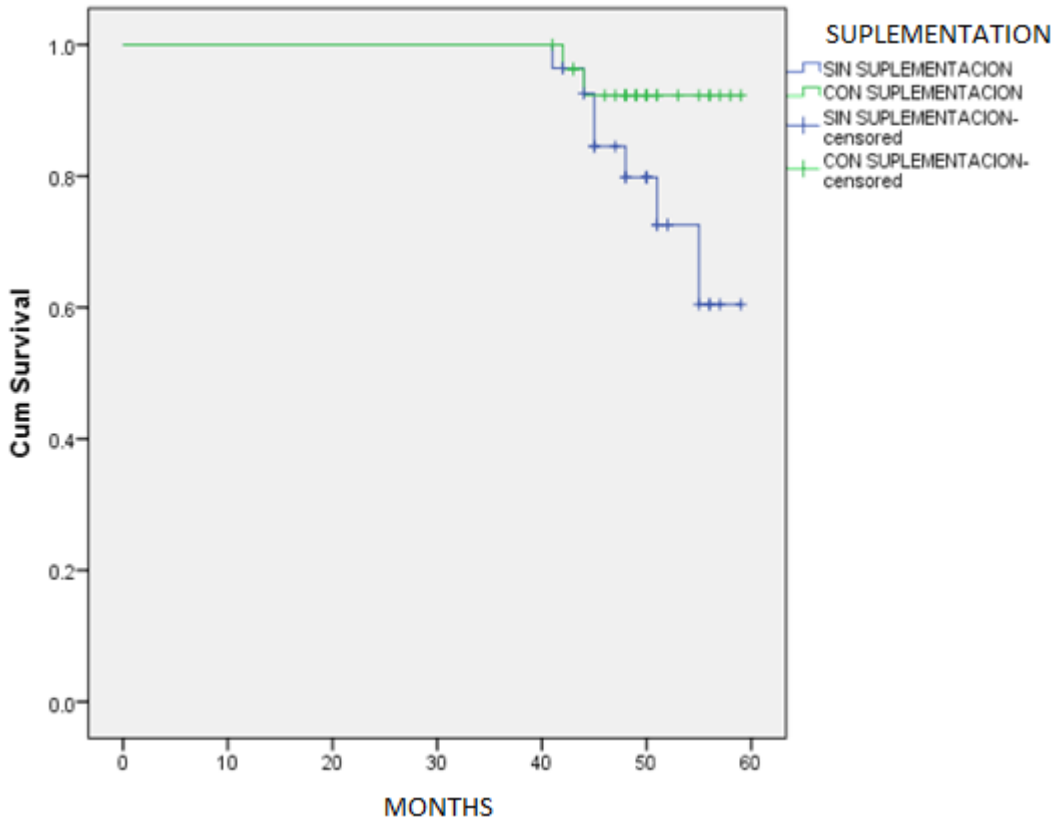
8%

Supplemented

15%

Placebo

P>0.05
Sin diferencias estadísticas entre grupos



Nutr Hosp. 2016; 33(2):411-414

Nutrition 29 (2013) 15–21

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Review

Role of antioxidants in cancer therapy

Vanessa Fuchs-Tarlovsky Ph.D., R.D. *

Servicio de Oncología, Hospital General de México, Dr. Balmis #148 Col. Doctores, México DF, 06750, México

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Keywords:
Antioxidant
Cancer therapy
Oxidative stress

ABSTRACT

Oxidative stress is a key component in linking environmental toxicity to the multistage carcinogenic process. Reactive oxygen species (ROS) are generated in response to both endogenous and exogenous stimuli. To counterbalance ROS-mediated injury, an endogenous antioxidants defense system exists; however, when oxidation exceeds the control mechanisms, oxidative stress arises. Chronic and cumulative oxidative stress induces deleterious modifications to a variety of macromolecular components, such as DNA, lipids, and proteins. A primary mechanism of many chemotherapy drugs against cancer cells is the formation of ROS, or free radicals. Radiotherapy is based on the fact that ionizing radiation destroys tumor cells. Radiotherapy induces direct lesions in the DNA or biological molecules, which eventually affect DNA. Free radicals produced by oncology therapy are often a source of serious side effects as well. The objective of this review is to provide information about the effects of antioxidants during oncology treatments and to discuss the possible events and efficacy. Much debate has arisen about whether antioxidant supplementation alters the efficacy of cancer chemotherapy. There is still limited evidence in both quality and sample size, suggesting that certain antioxidant supplements may reduce adverse reactions and toxicities. Significant reductions in toxicity may alleviate dose-limiting toxicities so that more patients are able to complete prescribed chemotherapy regimens and thus, in turn, improve the potential for success in terms of tumor response and survival.

Take home message

- Malnutrition in oncology patients is a very frequent problem.
- Oncology patients are in very high risk of malnutrition and therefore increasing the risk of complications, length of hospital stay and poor quality of life.
- Nutrition stategies must be found in order to modulate or reduce caquexia and be able to improve quality of life, oncology treatment tolerance and survival in cancer.

THANK YOU!!!