PROTEIN INTAKE NEL POST-OEPRATORIO

DOTT. ALBERTO CALABRESE

OSPEDALE S. MARIA - BARI

WHO

“Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health”

World Health Organization (WHO), Technical report series 894: Obesity: Preventing and managing the global epidemic. (PDF), Geneva, World Health Organization, 2000, ISBN 92-4-120894-5

BARIATRIC SURGERY
CLINICAL AND NUTRITIONAL COMPLICATION

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CLINICAL PRACTICE GUIDELINES FOR THE PERIOPERATIVE NUTRITIONAL, METABOLIC, AND NONSURGICAL SUPPORT OF THE BARIATRIC SURGERY PATIENT—2013 UPDATE: COSPONSORED BY AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS, THE OBESITY SOCIETY, AND AMERICAN SOCIETY FOR METABOLIC & BARIATRIC SURGERY⋆

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The European Journal of Obesity

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Review Article

Practical Recommendations of the Obesity Management Task Force of the European Association for the Study of Obesity for the Post-Bariatric Surgery Medical Management

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ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2017) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Review article

American Society for Metabolic and Bariatric Surgery Integrated Health Nutritional Guidelines for the Surgical Weight Loss Patient 2016 Update: Micronutrients

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Clinical Information

Interdisciplinary European Guidelines on Metabolic and Bariatric Surgery

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STEPS

- FIRST STEP

  FOOD HISTORY

  BIA AND ANTHROPOMETRIC VALUES

  10% WEIGHT REDUCTION

- SECOND STEP

  VLCKD

  LCKD

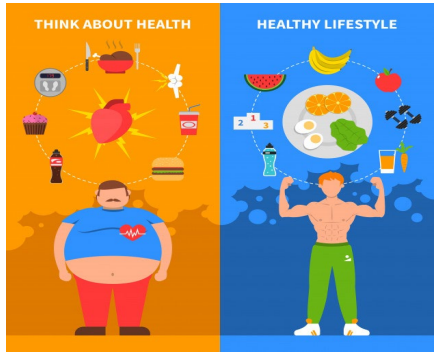
  LCD

- THIRD STEP

  FOLLOW-UP

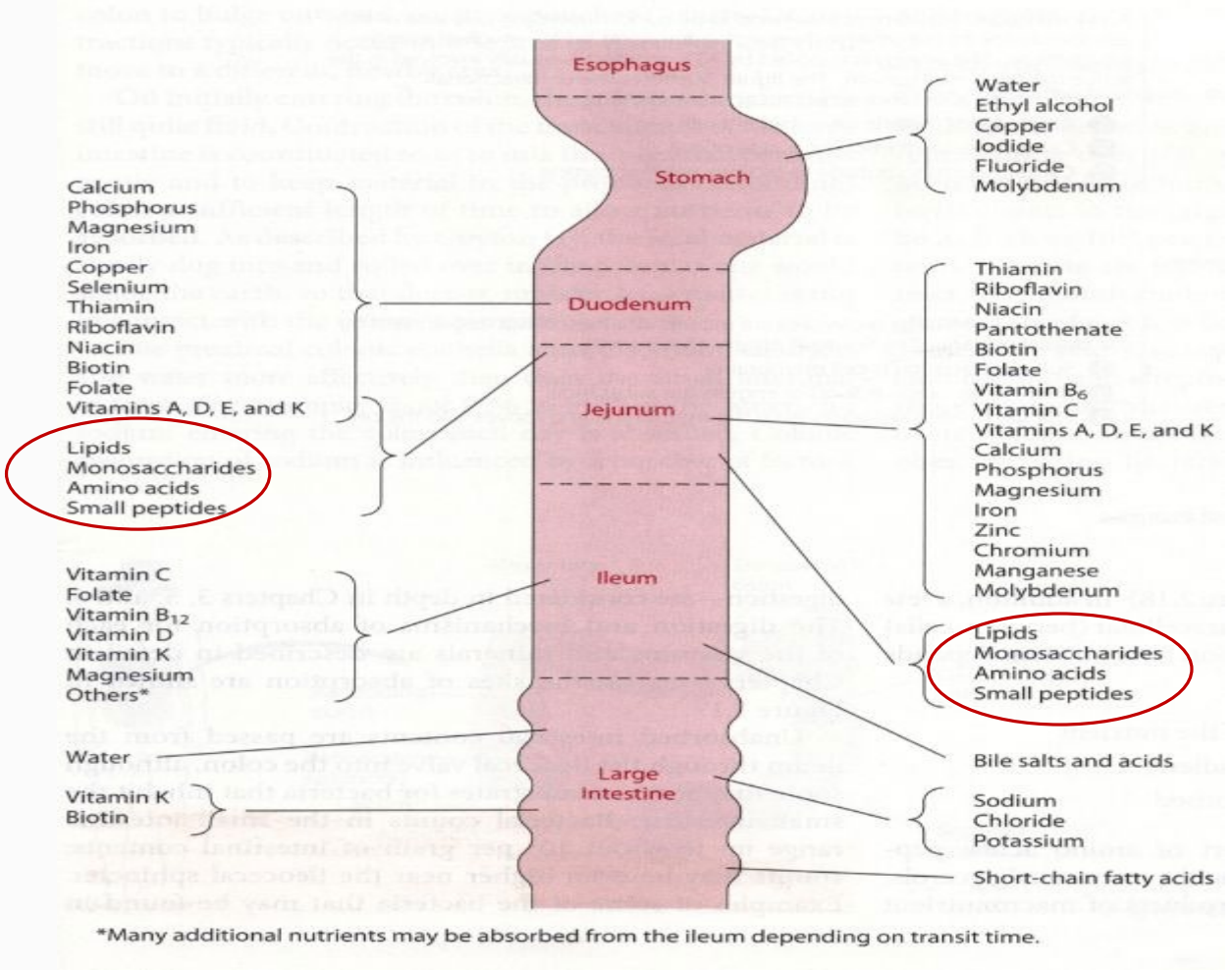
  FOOD PHASES

  FOOD SUPPLEMENT



MICRO AND MACRO NUTRIENTS ABSORPTION

"Advanced Nutrition And human metabolism by Grooper & smith 2009"



LOW FAT, LOW SUGAR....AND PROTEINS?

Journal of Cachexia, Sarcopenia and Muscle 2017; **8**: 345–348
Published online 25 April 2017 in Wiley Online Library (wileyonlinelibrary.com) **DOI:** 10.1002/jcsm.12176

Dietary protein content for an optimal diet: a clinical view

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Table 1. Protein quantity of commonly consumed protein foods.

Foods and USDA standard servings	Protein (g)	Energy (kcal)
1 "scoop" whey protein (shake)	24–26	113
3 oz cooked skinless chicken breast	26	130
3 oz cooked 95% lean ground beef	22	140
6 oz greek yogurt plain	17	100
2 large eggs	12	144
1/2 cup tofu	10	95
1/2 cup beans	8	110
2 tbsp peanut butter	8	190
1 oz almonds	6	165
1 cup cooked oatmeal	6	165
1/2 cup cooked quinoa	4	110

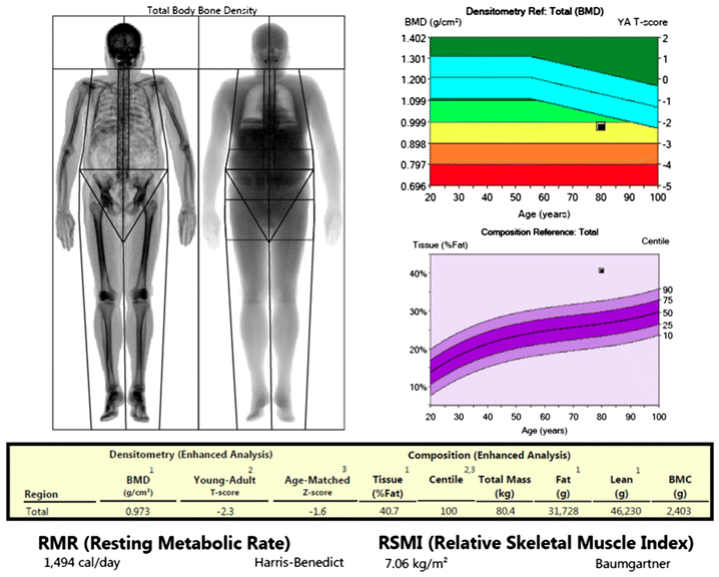
Note: 1 oz = 28.3 g; tbsp, tablespoon. United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference: ndb.nal.usda.gov/.

Il "Protein Summit 2", composto da più di 60 nutrizionisti, esperti di salute e educatori nutrizionali, suggerisce di aumentare in particolare l'assunzione di proteine animali perché più ricca di leucina e di conseguenza più efficace per influenzare il metabolismo proteico anabolico

Le proteine animali hanno una densità proteica elevata accompagnata dal minor contenuto energetico di questi alimenti in confronto con le proteine di origine vegetale

SARCOPENIA

Sindrome caratterizzata da perdita progressiva e generalizzata della massa e forza muscolare scheletrica con rischio di esiti avversi quali disabilità fisica, scarsa qualità della vita e morte

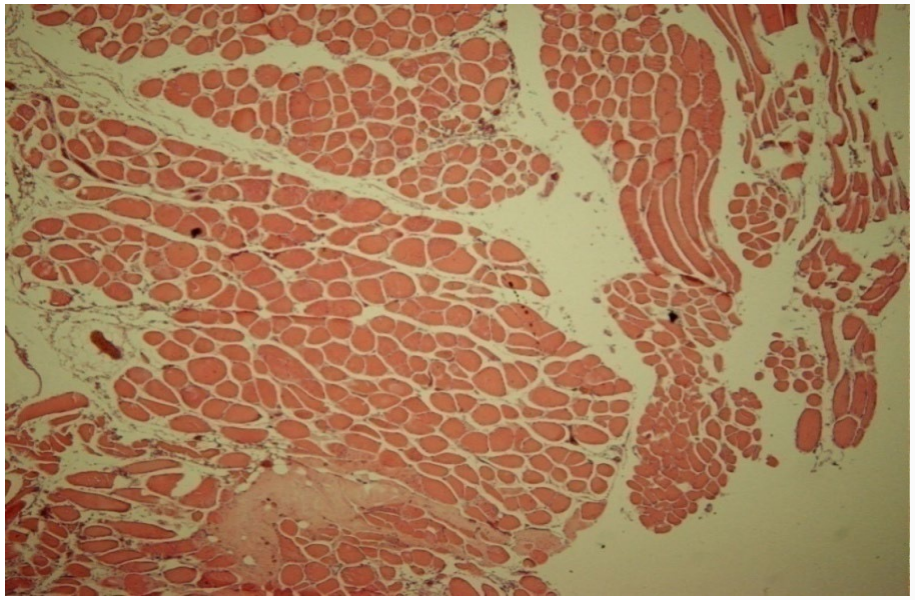


Obes Relat Dis. 2018 Jul;14(7):943-950.
Prevalence and predictors of postoperative thiamine deficiency after vertical sleeve gastrectomy. Tang L1, Alsulaim HA2, Canner JK3, Prokopowicz GP4, Steele KE5.

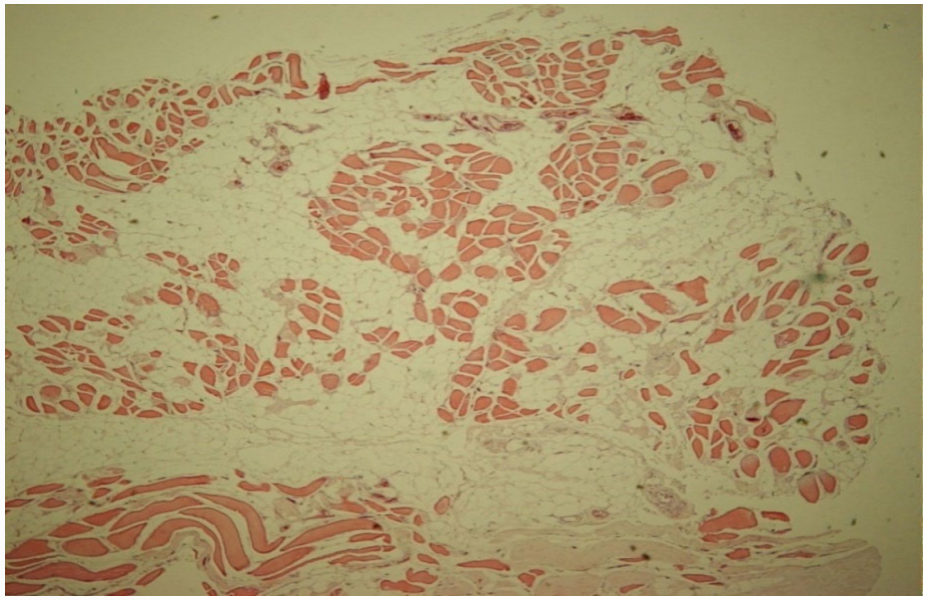
Prevalenza dell'8% nel pre-intervento
1/3 dei pazienti a un anno dalla Sleeve Gastrectomy

SARCOPENIA AND OBESITY

- Ectopic fat deposition changes muscle composition and declines muscle strength and function



Man 80 years old,
BMI 26



Man 79 years old,
BMI 35.2

Rossi A et al. Obesity 2010;18:2379

DIETARY APPROACH

Practical guidance for optimal dietary protein intake and exercise for older adults above 65 years

Recommendations
For healthy older adults, we recommend a diet that includes at least 1.0 to 1.2 g protein/kg body weight/day.
For certain older adults who have acute or chronic illnesses, 1.2 to 1.5 g protein/kg body weight/day may be indicated, with even higher intake for individuals with severe illness or injury.
We recommend daily physical activity for all older adults, as long as activity is possible. We also suggest resistance training, when possible, as part of an overall fitness regimen.

Deutz NE, Bauer JM,et all.:Protein intake and exercise for optimal muscle function with aging: recommendations from the ESPEN Expert Group. Clin Nutr. 2014 Dec;33(6):929-36

Dietary protein intake

- Older adults have greater protein needs to compensate for anabolic resistance and hypermetabolic disease.
- Older adults may also have decreased intake due to age-related appetite loss, medical conditions, financial limits.
- Optimal intake of at least 1.0 to 1.5 g protein/kg BW/day is recommended; individual needs depend upon the severity of malnutrition risk.

Exercise

- Regular exercise helps maintain skeletal muscle strength and function in older adults.
- Resistance training has limited but positive effects on recovery of muscle in older people.
- A combination of resistance training and adequate dietary protein/amino acid intake for healthy muscle aging is recommended.

AND IN THE BARIATRIC SURGERY?

OBES SURG (2016) 26:785–796
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ORIGINAL CONTRIBUTIONS

Micronutrient and Protein Deficiencies After Gastric Bypass and Sleeve Gastrectomy: a 1-year Follow-up

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Table 2 Energy, food, and macronutrient intakes according to the surgical models at baseline and 3 and 12 months

	GBP			SG		
	Baseline n=22	3 months n=22	12 months n=14	Baseline n=30	3 months n=30	12 months n=19
Energy and food intakes						
Energy intake, kcal/day	2005 (1539–2266)^{c}	711 (615–1006)^{a}	1226 (8133–1559)^{b}	1658 (1445–2395)^{c}	833 (539–1108)^{a}	1078 (793–1354)^{b}
BMR, kcal/day	2179 (2005–2409)^{c}	1770 (1702–2072)^{b}	1653 (1480–1791)^{a}	1959 (1853–2218)^{c}	1742 (1593–1894)^{b}	1686 (1565–1963)^{a}
Fruit and vegetables, serving/day	4.8 (3.2–7.0)^{b}	2.2 (0.8–3.2)^{a}	2.1 (1.5–3.9)^{ab}	3.0 (1.6–4.3)^{b}	1.5 (0.8–2.1)^{a}	1.4 (1.0–2.6)^{ab}
Starchy foods, serving/day	2.8 (2.1–3.7)^{b}	0.7 (0.3–1.2)^{a}	1.1 (0.8–1.6)^{a}	2.6 (2.1–3.3)^{c}	0.7 (0.3–1.1)^{a}	1.2 (0.7–1.7)^{b}
Dairy products, serving/day	2.1 (1.3–3.1)	1.7 (0.5–2.6)	2.1 (0.8–2.5)	1.6 (1.0–2.4)	1.4 (0.6–1.9)	1.2 (0.7–1.7)
Meat and fish, serving/day	1.4 (1.0–2.6)^{b}	0.8 (0.6–1.1)^{a}	0.7 (0.4–1.6)^{ab}	1.6 (1.1–2.5)^{b}	0.9 (0.6–1.4)^{a}	1.0 (0.7–1.8)^{ab}
Macronutrient intakes						
Protein, g/day	83.5 (70.6–105.6)^{c}	41.7 (24.0–49.0)^{a}	50.4 (36.9–65.2)^{b}	78.3 (64.0–107.2)^{c}	41.2 (26.8–52.6)^{a}	51.8 (36.4–65.3)^{b}
N (%), <60 g/day	2 (9)^{a}	19 (86)^{b}	9 (64)^{b}	4 (13)^{a}	26 (87)^{b}	11 (58)^{b}
Protein, g/kg/day	0.66 (0.57–0.73)^{b}	0.38 (0.24–0.46)^{a}	0.59 (0.48–0.72)^{b}	0.65 (0.57–0.80)^{c}	0.39 (0.29–0.50)^{a}	0.46 (0.39–0.74)^{b}
Total lipid, %EI/day	32.0 (30.0–40.6)	36.8 (32.4–39.3)	38.8 (33.6–45.6)	37.4 (33.2–39.9)	41.6 (35.8–44.7)	39.5 (37.1–44.5)
SFA, %EI/day	14.7 (11.3–16.4)	15.5 (13.1–16.6)	17.4 (13.7–20.9)	15.6 (14.5–18.7)	17.4 (15.3–19.6)	15.8 (13.7–19.4)
PUFA, %EI/day	4.8 (4.2–5.8)	4.3 (3.2–6.4)	3.5 (3.0–5.5)	5.0 (4.0–5.9)	5.0 (3.3–6.4)	5.6 (4.3–8.0)
Total carbohydrate, %EI/day	47.8 (42.0–49.7)	44.0 (38.9–49.2)	42.2 (35.4–47.1)	44.1 (40.0–46.7)	37.4 (32.3–46.8)	42.4 (33.4–45.1)

Labeled medians or percentages without a common letter differ between time points for each surgical model, as tested by paired pairwise post hoc comparisons with Holm-Bonferroni correction or paired McNemar's test

EI energy intake

A 1 anno di follow-up il 64% dei pazienti operati di bypass gastrico e il 58% dei pazienti operati di sleeve gastrectomy presentano un ridotto intake proteico (< 60 g/die).

60 g/die
APPORTO PROTEICO MINIMO PER MITIGARE LA PERDITA POSTOPERATORIA DI MASSA MAGRA NEI PRIMI MESI
Linee guida AACE/TOS/ ASMBS

...CONTINUE

Table 4 Metabolic and nutritional parameters according the surgical models at baseline and 3, 6, and 12 months

	GBP				SG			
	Baseline *n*=22	3 months *n*=22	6 months *n*=22	12 months *n*=14	Baseline *n*=30	3 months *n*=30	6 months *n*=30	12 months *n*=19
Hemoglobin (g/dl)	13.9 (13.0–14.7)	13.9 (13.4–14.7)	13.8 (13.5–14.1)	13.7 (13.3–14.1)	13.7 (13.2–14.5)	13.7 (12.9–14.4)	13.6 (13.1–14.1)	13.4 (13.0–14.1)
<12 g/dl, *N* (%)	2 (9)	0 (0)	1 (5)	1 (7)	0 (0)	1 (3)	0 (0)	1 (5)
Ferritin (µg/l)	115 (62–201)	86 (69–188)	96 (65–199)	100 (58–166)	121 (39–230)	154 (92–266)	144 (92–234)	144 (82–176)
<30 µg/l, *N* (%)	3 (14)	0 (0)	1 (5)	1 (7)	3 (10)	1 (3)	1 (3)	1 (5)
Iron (µmol/l)	14.0 (10.0–16.0)	13.0 (12.0–17.0)	15.0 (13.0–18.0)	15.0 (12.0–18.0)	15.0 (12.0–22.0)	16.0 (14.0–19.0)	17.0 (13.0–19.0)	16.5 (130–19.0)
<9 µmol/l, *N* (%)	4 (18)	0 (0)	0 (0)	0 (0)	2 (7)	2 (7)	0 (0)	1 (5)
Transferrin (g/l)	3.1 (2.7–3.1)	2.3 (2.2–2.8)	2.4 (2.1–2.8)	2.5 (2.0–2.8)	2.7 (2.5–2.9)	2.4 (2.2–2.7)	2.5 (2.3–2.7)	2.6 (2.3–2.7)
>3.1 g/l, *N* (%)	3 (14)	2 (9)	2 (9)	1 (7)	3 (10)	0 (0)	1 (3)	0 (0)
Total iron binding capacity (µmol/l)	67.5 (61.0–76.0)	58.0 (55.0–71.0)	59.0 (53.0–69.0)	62.0 (51.0–70.0)	66.5 (61.0–72.0)	61.0 (56.0–67.0)	62.0 (58.0–67.0)	64.0 (57.0–67.0)
>80 µmol/l, *N* (%)	1 (5)	2 (9)	1 (5)	1 (7)	2 (7)	0 (0)	1 (3)	0 (0)
Transferrin saturation coefficient (%)	0.21 (0.16–0.26)	0.22 (0.17–0.24)	0.25 (0.19–0.32)	0.24 (0.19–0.33)	0.25 (0.18–0.33)	0.29 (0.23–0.33)	0.28 (0.20–0.32)	0.25 (0.23–0.29)
<0.15 %, *N* (%)	5 (23)	3 (14)	1 (5)	3 (21)	2 (7)	1 (3)	1 (3)	1 (5)
Albumin (g/l)	35.5 (33.0–37.0)[a]	39.0 (36.0–41.0)[b]	38.0 (36.0–41.0)[b]	39.0 (37.0–40.0)[b]	37.0 (35.0–39.0)[a]	40.0 (37.0–42.0)[b]	40.0 (38.0–42.0)[b]	41.0 (38.0–42.0)[b]
<37 g/l, *N* (%)	13 (59)	7 (32)	6 (27)	3 (21)	14 (47)	6 (20)	2 (7)	3 (16)
Prealbumin (g/l)	0.25 (0.19–0.30)[b]	0.20 (0.16–0.21)[a]	0.20 (0.19–0.22)[a]	0.20 (0.18–0.25)[ab]	0.23 (0.21–0.25)[b]	0.18 (0.17–0.21)[a]	0.19 (0.18–0.21)[a]	0.19 (0.18–0.22)[a]
<0.2 g/l, *N* (%)	6 (27)	8 (37)	10 (45)	5 (38)	5 (17)[a]	17 (57)[b]	15 (50)[b]	10 (52)[b]
Calcium (mmol/l)	2.29 (2.24–2.37)	2.39 (2.33–2.43)	2.37 (2.28–2.39)	2.31 (2.26–2.39)	2.31 (2.24–2.38)	2.37 (2.31–2.44)	2.31 (2.28–2.38)	2.33 (2.31–2.38)
25(OH)-vitamin-D3 (ng/ml)	13.0 (10.0–23.0)[a]	–	29.5 (26.5–32.0)[b]	27.0 (22.0–29.0)[b]	17.0 (11.0–23.0)[a]	–	26.9 (22.5–30.5)[b]	25.0 (20.0–30.0)[b]
<30 ng/ml, *N* (%)	19 (86)	–	10 (45)	10 (71)	25 (83)	–	18 (60)	13 (68)
Parathyroid hormone (pg/ml)	48.3 (41.5–58.9)	–	–	44.1 (35.1–47.1)	46.8 (36.4–54.0)	–	–	39.5 (32.3–43.3)
>45 pg/ml, *N* (%)	13 (59)	–	–	6 (43)	15 (50)	–	–	4 (21)
Thiamin (nmol/l)	157 (150–174)	–	193 (155–193)	197 (174–215)	147 (134–175)	–	177 (158–191)	181 (149–218)
<126 nmol/l, *N* (%)	2 (9)	–	1 (5)	0 (0)	5 (17)	–	1 (3)	0 (0)
Erythrocyte folate (nmol/l)	1287 (1023–1429)	–	1760 (1457–1961)	1940 (1421–2169)	1234 (1036–1377)[a]	–	1411 (1246–1806)[b]	1540 (1366–1804)[b]
<945 nmol/l, *N* (%)	4 (18)	–	2 (9)	0 (0)	5 (17)	–	0 (0)	0 (0)
Serum folate (nmol/l)	16.8 (12.9–24.0)	–	26.9 (22.8–33.4)	27.9 (22.8–41.0)	17.7 (14.7–20.5)[a]	–	22.8 (18.4–28.4)[b]	20.2 (15.6–26.4)[b]
Vitamin B12 (pmol/l)	284 (209–334)	–	252 (227–345)	221 (195–278)	293 (248–358)	–	311 (224–464)	311 (216–432)
<140 pmol/l, *N* (%)	1 (5)	–	1 (5)	0 (0)	1 (3)	–	0 (0)	0 (0)

Labeled medians or percentages without a common letter differ between time points for each surgical model, as tested by paired pairwise post hoc comparisons with Holm-Bonferroni correction or paired McNemar's test. Normal ranges are as follows: hemoglobin 12–17 g/dl; ferritin 30–300 µg/l; iron 9–27 µmol/l; transferrin 1.7–3.1 g/l; total iron-binding capacity 40–80 µmol/l; transferrin saturation coefficient 0.15–0.35 %; albumin 37–50 g/l; prealbumin 0.2–0.35 g/l; calcium 2.1–2.65 mmol/l; 25(OH)-vitamin-D3 30–100 ng/ml; thiamin 126–250 nmol/l; serum folate 7–39.5 nmol/l, vitamin B12 140–490 pmol/l

A 1 anno di follow-up il 21% dei pazienti operati di bypass gastrico e il 16% dei pazienti operati di sleeve gastrectomy sono a rischio di malnutrizione proteica (albumina < 37 g/L).

Gli esami di laboratorio evidenziano una costante riduzione dei livelli di prealbumina nel 37 e 38% dei pazienti operati di bypass gastrico e nel 57 e 52% dei pazienti operati di sleeve gastrectomy, rispettivamente, dopo 3 e 12 mesi di follow-up.

CONCLUSION

- Un adeguato intake proteico post-chirurgico è essenziale per prevenire la perdita dei capelli, le infezioni, la scarsa guarigione delle ferite e la malnutrizione calorico-proteica.

- La quotidiana supplementazione multivitaminica e minerale almeno nel primo anno postoperatorio è in grado di prevenire la maggior parte dei deficit nutrizionali conseguenti a bypass gastrico e sleeve gastrectomy

IN THE END

L’ottimizzazione del risultato postoperatorio del paziente e dello stato nutrizionale, inizia prima dell'intervento. I pazienti devono essere istruiti prima e dopo l'intervento chirurgico sulle previste carenze nutrizionali associate ad alterazioni fisiologiche

I dati continuano a suggerire che la prevalenza di carenze di micronutrienti è in aumento, mentre il monitoraggio dei pazienti al follow-up sta diminuendo (63% -> 3%)

Parrott J, et all.: American Society for Metabolic and Bariatric Surgery Integrated Health Nutritional Guidelines for the Surgical Weight Loss Patient 2016 Update: Micronutrients Surg Obes Relat Dis. 2017 May;13(5):727-741


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CONDIVIDERE PER CRESCERE
Strategie di integrazione
in Chirurgia Bariatrica
Presidente del Congresso
ANTONIO BRAUN

Grazie