

MEETING ABSTRACT

Open Access

# Effects of nutritional supplements in healing of laparotomic dehiscences in obese patients with metabolic syndrome: a randomized prospective controlled study

M Galeotalanza<sup>1</sup>, S Spiezia<sup>2\*</sup>, M Santangelo<sup>2</sup>

From XXIII Annual Meeting of the Italian Society of Geriatric Surgery  
Lecce, Italy. 2-4 December 2010

## Background

Chronic venous insufficiency, infection, diabetes mellitus, excess malnutrition, exposure to pressure and shear, all conditions included in obesity, prolong the healing process. Moreover, a growing body of evidence clearly indicates that dietary supplementation or intravenous administration of Arg is beneficial in facilitating wound healing, enhancing insulin sensitivity, and maintaining tissue integrity. Arginine produces physiologic effects via nitric oxide dependent and independent pathways. Nitric oxide is important for the modulation of vascular tone, inflammation, immune function, endothelial function, platelet and leukocyte adherence, and neurotransmission. Nitric oxide modulates many biochemical processes important for the response to sepsis. Arginine, independent of nitric oxide, is important for growth, wound healing, cardiovascular function, immune function, inflammatory responses, energy metabolism, urea cycle function, and other metabolic processes. Arginine supplementation improves outcomes in animals with sepsis, wounds, ischemia-reperfusion injury, and following thermal injury. Enteral administration of arginine improves endothelial function but has little effect upon hemodynamics during human sepsis. An analysis of clinical studies using enteral formulas with supplemental arginine suggests benefits upon outcome, with no evidence of significant detrimental effects. The aim of this study was to evaluate the healing effects of a normocaloric diet enriched in arginine, eicosapentanoic acid (EPA)

and gamma-linolenic acid (GLA) and vitamins (vitamins A, C and E) on laparotomies wound dehiscence.

## Materials and methods

Thirty obese (BMI > 35 kg/m<sup>2</sup>) patients with acute wound infections were included in a study evaluating the effects of protein, lipids and vitamins on healing of wound dehiscence. A diet enriched with nutritional supplements of arginine, lipids (EPA, GLA) and vitamins (vitamins A, C and E) was compared with a diet not enriched. The healing of wound dehiscence was evaluated weekly. Nutritional assessment included levels of serum albumin, C-reactive protein.

## Results

Patient's age, severity of disease and gender distribution were similar in the two groups. The study group had a higher body mass index. At baseline, the wound dehiscences were similar in the two groups. A significant reduction of healing time of existing wounds was observed in the study group compared to the control group ( $p < 0.05$ ). There was no significant difference in the nutritional parameters between the two groups.

## Conclusions

A diet enriched with arginine, EPA, GLA and vitamins A, C and E is associated with a significantly lower healing time of wound dehiscences in critically obese patients

\* Correspondence: sergiospiezia@libero.it

<sup>2</sup>General, Thoracic and Vascular Surgery Department, O.U. of General Surgery and Organ Transplantation, University of Naples "Federico II," Naples, Italy  
Full list of author information is available at the end of the article

## Author details

<sup>1</sup>Department of Neuroscience, Physiology Nutrition Unit, University Federico II, Naples, Italy. <sup>2</sup>General, Thoracic and Vascular Surgery Department, O.U. of

General Surgery and Organ Transplantation, University of Naples "Federico II," Naples, Italy.

Published: 24 August 2011

## References

1. Velioglu Ogünç A, Manukyan M, Cingi A, Eksioğlu-Demiralp E, Özdemir Aktan A, Süha Yalçın A: **Dietary whey supplementation in experimental models of wound healing.** *Int J Vitam Nutr Res* 2008, **78**(2):70-73.
2. McDaniel JC, Belury M, Ahijevych K, Blakely W: **Omega-3 fatty acids effect on wound healing.** *Wound Repair Regen* 2008, **16**(3):337-345.
3. Hankenson KD, Watkins BA, Schoenlein IA, Allen KG, Turek JJ: **Omega-3 fatty acids enhance ligament fibroblast collagen formation in association with changes in interleukin-6 production.** *Proc Soc Exp Biol Med* 2000, **223**(1):88-95.
4. Zhang XJ, Chinkes DL, Wolfe RR: **The anabolic effect of arginine on proteins in skin wound and muscle is independent of nitric oxide production.** *Clin Nutr* 2008, **27**(4):649-656, Epub 2008 Mar 7.
5. Zhang XJ, Chinkes DL, Wolfe RR: **Leucine supplementation has an anabolic effect on proteins in rabbit skin wound and muscle.** *J Nutr* 2004, **134**(12):3313-8.
6. Garlick PJ: **The role of leucine in the regulation of protein metabolism.** *J Nutr* 2005, **135**(6 Suppl):1553S-1556S.
7. Stechmiller JK, Childress B, Cowan L: **Arginine supplementation and wound healing.** *Nutr Clin Pract* 2005, **20**(1):52-61.
8. Shi HP, Efron DT, Most D, Tantry US, Barbul A: **Supplemental dietary arginine enhances wound healing in normal but not inducible nitric oxide synthase knockout mice.** *Surgery* 2000, **128**(2):374-378.
9. Shi HP, Most D, Efron DT, Witte MB, Barbul A: **Supplemental L-arginine enhances wound healing in diabetic rats.** *Wound Repair Regen* 2003, **11**(3):198-203.
10. Shi HP, Wang SM, Zhang GX, Zhang YJ, Barbul A: **Supplemental L-arginine enhances wound healing following trauma/hemorrhagic shock.** *Wound Repair Regen* 2007, **15**(1):66-70.
11. Ord H: **Nutritional support for patients with infected wounds.** *Br J Nurs* 2007, **16**(21):1346-8, 1350-1352.
12. Collins N: **Arginine and wound healing: a case study.** *Adv Skin Wound Care* 2004, **17**(2):59-60.
13. Wilmore DW: **The effect of glutamine supplementation in patients following elective surgery and accidental injury.** *J Nutr* 2001, **131**(9 Suppl):2543S-9S, discussion 2550S-1S.
14. Boelens PG, Nijveldt RJ, Houdijk AP, Meijer S, van Leeuwen PA: **Glutamine alimentionation in catabolic state.** *J Nutr* 2001, **131**(9 Suppl):2569S-2577S, discussion 2590S.
15. Ayello EA, Thomas DR, Litchford MA: **Nutritional aspects of wound healing.** *Home Healthc Nurse* 1999, **17**(11):719-729.
16. Shashidharan M, Lin KM, Ternent CA, Smyrk TC, Thorson AG, Blatchford GJ, Christensen MA: **Influence of arginine dietary supplementation on healing colonic anastomosis in the rat.** *Dis Colon Rectum* 1999, **42**(12):1613-1617.
17. Wallace E: **Feeding the wound: nutrition and wound care.** *Br J Nurs* 1994, **3**(13):662-667.
18. Campos AC, Groth AK, Branco AB: **Assessment and nutritional aspects of wound healing.** *Curr Opin Clin Nutr Metab Care* 2008, **11**(3):281-288.

doi:10.1186/1471-2318-11-S1-A19

**Cite this article as:** Galeotalanza et al.: Effects of nutritional supplements in healing of laparotomic dehiscences in obese patients with metabolic syndrome: a randomized prospective controlled study. *BMC Geriatrics* 2011 **11**(Suppl 1):A19.

**Submit your next manuscript to BioMed Central and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)

