Cardio-Respiratory Failure

Does Nutritional Intervention Improve Function/Capacity in COPD?

Annemie Schols
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Annemie Schols
Department of Pulmonology, Maastricht University

Weight gain - supplemental nutrition - muscle respiratory function
Underweight -> decreased survival

Weight gain -> increased survival

Schols, AJRCCM, 1997

Landbo, AJRCCM, 1999
Nutritional Support for Individuals With COPD*

A Meta-analysis

Ivan M. Ferreira, MD, PhD; Dina Brooks, PhD, MSc; BSc(PT);
Yves Lacasse, MD, MSc; and Roger S. Goldstein, MB, ChB, FCCP

Rationale: Malnutrition in patients with COPD is associated with an impaired pulmonary status, reduced diaphragmatic mass, lower exercise capacity, and higher mortality rate when compared to adequately nourished individuals with COPD. Nutritional support may therefore be a useful part of their comprehensive care.

Purpose: To conduct a meta-analysis of randomized controlled trials (RCTs) to clarify whether nutritional supplementation (caloric supplementation for at least 2 weeks) improved anthropometric measures, pulmonary function, respiratory muscle strength, and functional exercise capacity in patients with stable COPD.

Methods: RCTs were identified from several sources, including the Cochrane Airways Group register of RCTs, a hand search of abstracts presented at international meetings, and consultation with experts. Two reviewers independently selected trials for inclusion, assessed quality, and extracted the data. Within each trial and for each outcome, we calculated an effect size. The effect sizes were then pooled by a random-effects model. Homogeneity among the effect sizes was also tested.

Results: From 272 references, nine RCTs were ultimately included. Six articles were considered as high quality. Only two studies were double blinded. For each of the outcomes studied, the effect of nutritional support was small: the 95% confidence intervals around the pooled effect sizes all included zero. The effect of nutritional support was homogeneous across studies.

Conclusion: Nutritional support had no effect on improving anthropometric measures, lung function, or functional exercise capacity among patients with stable COPD.

(CHEST 2000; 117:672–678)

Key words: COPD; meta-analysis; nutrition; respiratory rehabilitation; systematic review

Abbreviations: BMI = body mass index; CI = confidence interval; RCT = randomized controlled trials
Rationale for nutritional therapy

- Weight loss
- Muscle wasting
- Intrinsic muscle abnormalities
Short term intervention: < 2 weeks

- Weight gain
- Body composition?
- Improvement in respiratory muscle function
- No improvement in limb muscle function
Longer term intervention: 4 weeks-3 months

- Weight gain
- Increase in fat-free mass
- Improvement in respiratory muscle function
- Improvement in limb muscle function
- Improvement in exercise capacity
- Improvement in health status
Nutrition as integrated part of pulmonary rehabilitation

Nutritional intervention: 2-3 liquid supplements daily
Exercise program: endurance training i.r.t. daily activities

Creutzberg, Nutrition, 2003
Weight gain after nutritional supplementation in a controlled rehabilitation setting

Adapted from Creutzberg; AJRCCM 2000
**systemic COPD management**

- **underweight**  
  BMI ≤ 21 kg/m²

- **normal weight**  
  21 < BMI ≤ 25 kg/m²

- **overweight**  
  25 < BMI ≤ 30 kg/m²

- **obese**  
  BMI > 30 kg/m²

**SCREENING**

- **involuntary weight loss**  
  > 5% in 1 month or > 10% in 6 months

- **low fat-free mass**  
  FFMI ≤ 15 or ≤16 kg/m²

- **weight stable**

- **normal fat-free mass**

**THERAPY**

- **supplemental nutrition**  
  1. Adaptation of dietary intake
  2. Oral liquid supplements (1-3 daily)
  3. Enteral nutrition

- **maintenance therapy**  
  - Exercise
  - Optimisation of dietary intake

- **FOLLOW-UP**  
  Re-screening & functional assessment

- **sufficient**

- **insufficient**
  1. Motivation
  2. Knowledge
  3. Psychological state
  4. Social support

- **anabolic stimulation**  
  - Type of exercise
  - Intensity of exercise
  - Anabolic steroids

- **anti-catabolic modulation**  
  - Decrease dose of oral glucocorticosteroids
  - Pharmaceuticals?
  - Nutriceuticals?

**THERAPY**

- 3 months

- 6 months

- 3 months