Egy NAGYON SZUBJEKTÍV beszámoló a 39. ESPEN kongresszusról

Dr. Kálmán István
Nutrition support in hospitalised adults at nutritional risk (Review)


Ez itt csak a tartalomjegyzék
1421 (!!!) oldal
PLAIN LANGUAGE SUMMARY

Feeding support in hospitalised adults at risk of undernourishment

Review question

We reviewed the benefits and harms of feeding support given to adults in hospital at risk of undernourishment.

People who are malnourished when they are admitted to hospital might be at increased risk of death or are more likely to experience a serious complication. Delivering feeding support might help them, although being malnourished may be associated with a severe underlying disease. In this case, specific interventions aimed at improving their nutritional status would not help, as it would not be the poor nutritional status in itself that caused the increased risk of death or of experiencing a serious harm.

We found no evidence of a difference between nutrition support and control for risk of death.

Study characteristics

We included 244 trials, with 28,619 participants. The included trials assessed the effects of different kinds of nutrition support (i.e. dietary changes, enteral and parenteral nutrition, and dietary manipulations of feeding the patient). For their intervention, we calculated results for the risk of death. There were no differences in the estimated risks of death reported in the trials.

We found no evidence of a difference between nutrition support and control for risk of a serious complications in the short term.

We found no evidence of a difference between nutrition support and control for risk of death. We found that 8.3% people died at short-term follow-up in the control groups compared with 7.8% in those who had been given nutritional support (low quality of evidence). At the longest point of follow-up 13.2% people in the control groups died compared with 12.2% in those who had been given nutritional support (low quality of evidence). We found no evidence of a difference between nutrition support and control for risk of a serious complications in the short term. People in the control groups had a serious complication rate of 9.9% at short-term follow-up compared with 9.2% with nutrition (low quality of evidence). At long-term follow-up 15.2% of people in the control groups had a serious complication compared with 13.8% in the nutrition groups (low quality of evidence). These results are based on just 39,000 people. Nutritional support was associated with a 13.2% reduction in the risk of death. These results were consistent for death and serious complications, and very low quality for weight.

Quality of the evidence

The evidence for our conclusions is of low quality for death and serious complications, and very low quality for weight. All trials had a high risk of bias (i.e. the trials were all conducted in a way that may overestimate the benefits and underestimate the harms of nutrition support). The results were consistent for death and serious complications, but there was a high level of variation in the effects on weight across the studies.
OR64
FASTING IS THE STRONGEST RISK FACTOR FOR HOSPITAL MORTALITY IN CRITICALLY ILL UNDERWEIGHT PATIENTS

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Rationale: Critically ill underweight patients have worse outcomes than normal or overweight patients. The impact of fasting in this population is not established.

Methods: Prospective, two-center, observational study, was designed to assess the effect of fasting in underweight critically ill patients. All patients consecutively admitted (November 2015 to February 2017) to general intensive care units (ICU) with IMC $<20$ kg/m$^2$ were included. Exclusion criteria were: palliative care, exclusively oral nutrition, pregnancy, life expectancy $<24$ h and discharge before day 5 of ICU admission. Patients had their fasting status evaluated after ICU admission between days 2 and 3 (1\textsuperscript{st} evaluation) and 5 and 7 (2\textsuperscript{nd} evaluation). Patients were divided into two groups: fasting group those that did not receive nutrition support at least in one evaluation and fed group those that received nutrition support both evaluations. Patients were followed until hospital discharge.
Results: The hospital mortality rate of 189 included patients was 60.8% after 10(6-26) days of follow-up (age 54.2 ± 16.8 years, male 114(60.3%), SAPS3 68.4 ± 13.3, BMI 17.5 ± 2.2, NUTRIC 4.4 ± 1.7). The fasting group had higher NUTRIC scores (4.9 ± 1.8 vs 4.2 ± 1.6 p = 0.012) and were more commonly surgical patients (69.9% vs 56.4% p = 0.001) compared with the fed group. The fasting group had higher lactate levels (mmol/L) (1.6[1-2.6] vs 1.3 [1.0-1.8] p = 0.046) compared to the fed group. There was no difference between fasting and fed group regarding SAPS3 score, BMI and gender. In cox regression multivariate regression model (HR, 95%), fasting was independently associated with mortality (fasting 2.08[1.33-3.27]; SAPS3 1.01[0.99-1.03]; NUTRIC 1.14[0.99-1.30]; surgical admission 0.94 [0.44-2.0]; lactate 1.13[1.06-1.21]).

Conclusion: In underweight critically ill patients fasting was the strongest predictor for in-hospital mortality.

Disclosure of Interest: None declared.
The Dynamic Skeletal Muscle Organ That Orchestrates Whole Body Metabolism
Josep M. Argiles
University of Barcelona, Spain

WHY MAINTAINING MUSCLE MATTERS
Muscle plays structural and metabolic roles • Loss of lean body mass impacts patient outcomes

MUSCLE FUNCTION
Structural
- Strength & Power
- Mobility
- Posture & Balance

Metabolic
- Regulates Blood Glucose
- Stores Proteins & Glycogen
- Synthesizes & Stores Glutamine

Inter-organ Crosstalk

METABOLIC CONSIDERATIONS in SKELETAL MUSCLE
Myogenesis
SATELLITE CELL
Apoptosis
Glucose metabolism
ENERGY
Mitochondrial respiration
Synthesis
PROTEIN
Breakdown
Oxidation
LIPIDS
Intracellular accumulation
BLOOD FLOW
The Dynamic Skeletal Muscle Organ That Orchestrates Whole Body Metabolism
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WHY MAINTAINING MUSCLE MATTERS
Muscle plays structural and metabolic roles • Loss of lean body mass impacts patient outcomes

YOU CAN’T ALWAYS SEE MUSCLE LOSS
BMI doesn’t always tell you the full story:
Same BMI, different LBM by DXA

IDENTIFY
Patients at risk of muscle loss, especially those with recent weight loss and acute or chronic illness

INTERVENE
Exercise & Physical Activity
Nutrition
• Nutrition counseling
• High-protein foods and snacks
• Oral nutritional supplementation

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Skeletal Muscle Regulates Metabolism via Interorgan Crosstalk: Roles in Health and Disease

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Skeletal Muscle Regulates Metabolism via Interorgan Crosstalk: Roles in Health and Disease

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b Abbott Nutrition Research and Development, Granada, Spain
c Department of Geriatrics, Hospital Universitario de Getafe and School of Health Sciences, Universidad Europea de Madrid, Getafe, Spain

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**Fig. 2.** Effects of aging and illness on muscle mass.

**Loss of lean body mass**
- **-10%**
  - Decreased immunity
  - Increased risk of infection
- **-20%**
  - Decreased wound healing
  - Increased muscle weakness
  - Increased risk of infection
- **-30%**
  - Difficulty sitting
  - Pressure ulcers
  - Pneumonia
  - Inability to heal
- **-40%**
  - Increased risk of death, usually from pneumonia

**Associated complications**

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**Fig. 3.** Complications of lean body mass (muscle) loss.
Skeletal Muscle Regulates Metabolism via Interorgan Crosstalk: Roles in Health and Disease

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Physical activity, especially resistance training stimulates protein synthesis in muscle

Exercise

Nutrition

High-protein diets including EAAs and BCAAs contribute to muscle accretion

The leucine metabolite HMB is a potent stimulator of protein synthesis in muscle

Undernutrition and resultant muscle loss (muscle atrophy), as associated with aging and disease, can lead to adverse health and economic consequences. Conditions and diseases that lower dietary intake and increase nutrient needs are associated with catabolism of skeletal muscle, which in turn limits availability of protein and energy throughout the body. Loss of muscle mass, strength, and function has adverse consequences: slowed wound healing and recovery from illness, physical disability (due both to overall reduction of muscle status), as well as selective losses in type I fibers, which are essential for balance recovery (and thus fall prevention), poorer quality of life, and higher health care costs.

Nutrition and exercise are key to growth and maintenance of muscle promoting overall health, well-being, and recovery from disease.

Considerable evidence shows that ONS and enteral feeding formulations can help maintain and rebuild muscle mass and strength.

Fig. 4. Treatments for sarcopenia. It is currently recommended that patients at risk of or suffering from sarcopenia consume a diet high in protein, engage in resistance exercise, and take supplements of the leucine metabolite HMB.
Combining nutrition and exercise to optimize survival and recovery from critical illness: Conceptual and methodological issues

Daren K. Heyland a, *, Renee D. Stapleton b, Marina Mourtzakis c, Catherine L. Hough d, Peter Morris e, Nicolaas E. Deutz f, Elizabeth Colantuoni g, Andrew Day a, Carla M. Prado h, Dale M. Needham i


Multimodal Intervention

Legend: PUFA: Polyunsaturated fatty acids (eicosapentaenoic acid, n-3, fish oil); HMB: β-Hydroxy β-methylbutyric acid. Multimodal interventions can include treatments from all domains. While we have focused on protein and amino acids in the proposed intervention, the potential use of n-3 fatty acids to attenuate inflammation while also promoting anabolism in other clinical scenarios could be investigated.

Fig. 1. Multimodal approach to optimize recovery from critical illness.

4. Concluding remarks

Survivors of critical illness commonly exhibit muscle weakness, which contributes to impairments in their physical function and quality of life, while increasing healthcare utilization. We posit that to maintain optimal muscle mass, strength and physical function, the combination of nutrition and exercise may have the greatest impact on physical recovery of survivors of critical illness. Randomized trials testing this and related hypotheses are needed. We discussed key methodological issues and proposed a common evaluation framework to stimulate work in this area and standardize our approach to outcome assessments across future studies.
Resting energy expenditure, calorie and protein consumption in critically ill patients: a retrospective cohort study

Fig. 2 Association of administered calories/resting energy expenditure (Adcal/REE) percent with 60-day mortality (left), and protein intake by daily requirement (1.3 g/kg/d) with 60-day mortality (right) by odds ratio. REE resting energy expenditure

70 – 100% energiabevitel optimális túlélés

+1 g protein -1 % mortalitás
Conclusions
The findings of this study suggest that both underfeeding and overfeeding appear to be harmful to mechanically ventilated, critically ill patients. While an energy target of 100% of assessed requirements remains the ideal goal, the reality of ICU inevitably precludes this ideal. In this regard we have shown that achieving an Adcal/REE of at least 70% had a survival advantage, while a higher caloric intake, especially >100% may be associated with harm. The optimal way to define caloric goals therefore requires an exact estimate, which is ideally performed using indirect calorimetry. These findings provide a basis for future randomized controlled trials comparing specific nutritional regimens based on indirect calorimetry measurements.
Assessment of adult malnutrition and prognosis with bioelectrical impedance analysis: phase angle and impedance ratio


Henry C. Lukaski, Ursula G. Kyle, and Jens Kondrup

KEY POINTS

- Phase angle is not diagnostic. It is a parameter, similar to body temperature, that can be used to monitor progression of a disease or effectiveness of intervention. Values at, above, or below reference values may be useful in patient care and clinical outcomes.

- Use of phase angle as a biomarker of malnutrition should include an assessment of hydration because inflammation, which is present in disease-related malnutrition and aging, affects fluid distribution.

- Clinical trials of patients with low phase angle are needed to ascertain the appropriate treatments (nutritional support, treatment for inflammation, or both) that affect prognosis.

- Phase-sensitive bioimpedance instruments and low inherent impedance electrodes are required for valid measurements of phase angle.

- Preliminary evidence suggests that impedance ratio and phase angle are similar in prognosis for cancer patients and critically ill patients. Studies with large sample sizes estimated with power analysis are needed to clarify the benefit of these putative indicators of prognosis.

FIGURE 1. Vector positions on the RXc graph indicating theoretical body composition differences with similar phase angles but different hydration shown as vector length (unpublished data).
Fat-free mass at admission predicts 28-day mortality in intensive care unit patients: the international prospective observational study Phase Angle Project

Ronan Thibault¹,², Anne-Marie Makhlouf³, Aurélien Mulliez⁴, M. Cristina Gonzalez⁵, Gintautas Kekstas⁶, Nada Rotovnik Kozjek⁷, Jean-Charles Preiser⁷, Isabel Ceniceros Rozalen⁸, Sylvain Dadet⁹, Zeljko Krzunic⁴, Kinga Kupczyk¹¹, Fabienne Tamion¹², Noël Cano¹³, Claude Pichard¹ and Phase Angle Project Investigators

Standard equations: invalid in the intensive care unit because of rapid fluid shifts

Bioelectrical impedance analysis:
Measurement of fat-free mass
Prognostic value

Phase angle
Calculated from two whole body electrical parameters RESISTANCE and REACTANCE:
\[ \text{arctan}(\text{REACTANCE/RESISTANCE}) \times (180/\pi) \]

Low phase angle
Increased cell permeability: \[ \uparrow \text{REACTANCE} \]
Decreased fat-free mass: \[ \uparrow \text{RESISTANCE} \]

Illness severity:
Cell dysfunction
Malnutrition

Normal or high phase angle
Decreased cell permeability: \[ \downarrow \text{REACTANCE} \]
Increased fat-free mass: \[ \downarrow \text{RESISTANCE} \]

Improved cell health:
Gain in cell function
Better nutritional status

Fig. 1 Measurement of fat-free mass by phase angle derived from bioelectrical impedance analysis: principles and prognostic value. The method of phase angle measurement by bioelectrical impedance analysis is detailed in the ‘Methods’ section
InBody

Body Composition Analysis

<table>
<thead>
<tr>
<th>ID</th>
<th>Height</th>
<th>Age</th>
<th>Gender</th>
<th>Test Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>190 cm</td>
<td>50</td>
<td>Male</td>
<td>2017.09.10 10:51</td>
</tr>
</tbody>
</table>

**Total Body Water:** 61.0

- **Left Body Water:** 61.0
- **Right Body Water:** 78.5

**Protein (kg):** 16.5

- **Left Protein:** 12.2
- **Right Protein:** 14.3

**Minerals (kg):** 5.50

- **Left Minerals:** 4.21
- **Right Minerals:** 6.35

**Body Fat Mass (kg):** 6.5

- **Left Body Fat Mass:** 9.7
- **Right Body Fat Mass:** 19.5

Muscle-Fat Analysis

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Under</th>
<th>Normal</th>
<th>Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.5</td>
<td>0.0</td>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

SMM (Normal Muscle Mass (kg))

- **Left SMM:** 49.7%
- **Right SMM:** 41.7%

Body Fat Mass (kg)

- **Left Body Fat Mass:** 13.8
- **Right Body Fat Mass:** 13.6

Obesity Analysis

<table>
<thead>
<tr>
<th>BMI</th>
<th>Under</th>
<th>Normal</th>
<th>Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.3</td>
<td>0.0</td>
<td>100%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

PBF (Percent Body Fat (%))

- **Left PBF:** 7.2
- **Right PBF:** 7.2

Segmental Lean Analysis

<table>
<thead>
<tr>
<th>Right Arm (kg)</th>
<th>Under</th>
<th>Normal</th>
<th>Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.21</td>
<td>0.0</td>
<td>100%</td>
<td>0.0</td>
</tr>
<tr>
<td>Left Arm (kg)</td>
<td>5.31</td>
<td>100%</td>
<td>0.0</td>
</tr>
<tr>
<td>Trunk (kg)</td>
<td>131.2</td>
<td>0.0</td>
<td>100%</td>
</tr>
<tr>
<td>Right Leg (kg)</td>
<td>12.37</td>
<td>0.0</td>
<td>100%</td>
</tr>
<tr>
<td>Left Leg (kg)</td>
<td>120.3</td>
<td>0.0</td>
<td>100%</td>
</tr>
</tbody>
</table>

ECW Ratio

- **ECW Ratio:** 0.376

Whole Body Phase Angle

- **6.7°**

Body Composition History

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>SMM (Normal Muscle Mass (kg))</th>
<th>PBF (%)</th>
<th>ECW Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.5</td>
<td>45.4</td>
<td>7.2</td>
<td>0.372</td>
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</table>

Body Composition Score

- **94/100 Points**

Visceral Fat Area

- **VFAR:** 23.0

Weight Control

- **Target Weight:** 89.5 kg
- **Weight Control:** 0.0 kg
- **Fat Control:** 0.0 kg
- **Muscle Control:** 0.0 kg

Segmental Fat Analysis

- **Right Arm:** 0.14 kg, 17.4%
- **Left Arm:** 0.14 kg, 17.4%
- **Trunk:** 3.3 kg, 48.9%
- **Right Leg:** 1.34 kg, 58.6%
- **Left Leg:** 1.34 kg, 47.0%

Research Parameters

- **Intracellular Water:** 38.1 kg (28.3–34.5)
- **Extracellular Water:** 22.9 kg (14.7–21.2)
- **Basal Metabolic Rate:** 2185 kcal
- **Bone Mineral Content:** 4.51 kg (2.47–4.25)
- **Body Cell Mass:** 54.6 kg (40.0–54.9)
- **Am Muscle Circumference:** 34.6 cm
- **FFM:** 22.5 kg
- **SMI:** 1.75 kg/m²

InBody Score

- **94/100 Points**

Bodystat

**BODY COMPOSITION ANALYSIS:**
**INTERPRETATION OF QUADSCAN4000 DATA**

- **Set by internal real-time clock**
- **Optional metric/imperial units**
- **Calculated calories required**
- **Case-specific normal values**
- **Based on individual's body composition**
- **Lean mass excluding fat mass (Fat-Free Mass)**
- **Total mass of cells (metabolically active tissue)**
- **Nutrition index – ratio between ECW & TBF**
- **Basal metabolic rate (calorific requirement at rest)**
- **Body mass index**
- **Fat-free mass index**
- **Impedance is a measure of how current passes through the cell, which is made up of reactance (the ability to slow a current) and resistance (opposition to the flow of electrical current in the body)**

- **InBody Score**
- **Impedance 50 kHz**
- **Reactance 50 kHz**

- **Fat-Free Mass Index**
- **Body Fat Mass Index**
- **Raw data – (OHMS) must always show progressive reduction**
Köszönöm a figyelmét!