2-1-2013

Assessment of nutritional adequacy in patients on extracorporeal membrane oxygenation.

Hitoshi Hirose, MD, PhD
*Thomas Jefferson University*, Hitoshi.Hirose@Jefferson.edu

Joseph Miessau, PA-C
*Thomas Jefferson University*

Evanthia Foliou, RD
*Thomas Jefferson University*

Pawel Karbowski, PA-C, MS
*Thomas Jefferson University*

Melanie K. Sion, MD
*Thomas Jefferson University*, Melanie.Sion@jefferson.edu

*See next page for additional authors*

**Let us know how access to this document benefits you**

Follow this and additional works at: https://jdc.jefferson.edu/surgeryfp

Part of the [Surgery Commons](https://jdc.jefferson.edu/surgeryfp)

**Recommended Citation**

**Introduction**

Nutrition is a key element of recovery from the state of critical illness. Little is known about nutritional adequacy in patients supported on extracorporeal membrane oxygenation (ECMO) for severe cardio-respiratory dysfunction. There are theoretical concerns regarding safety, timing and adequacy of calorie feedings in a hyper-metabolic state and the effect on morbidity and mortality.

**Methods**

A retrospective review for ECMO patients. Study period: July 2010 and June 2012

2 groups: survivors (16) and non-survivors (29).

Age, sex, preoperative comorbidities, type and duration of ECMO, day to initiation and goal feeding, caloric intake, weekly biomarkers, end-organ recovery and scores were compared between 2 groups.

Biomarkers:
- Pre-albumin
- Albumin
- C-reactive protein

Total Number of ECMO: 45
Venovenous ECMO : 8
17 patients with a BMI over 30
12 patient required total parenteral nutrition

**Nutritional Adequacy**

Determining caloric requirement is difficult. The use of a metabolic cart to perform indirect calorimetry is not possible on ECMO. Patients on ECMO are unable to meet criteria for the best predictive equations.

Energy requirements for patients on ECMO are based on calories per body weight.

Caloric target : 25kcal/kg/day and adjusted accordingly for obese and underweight patients.

Protein requirements :1.5-2.0g/kg/day per usual weight if normal weight and based on ideal body weight (IBW) if obese (Cresci).

Preferably enteral feedings were provided via post-pyloric tube.

TPN was an option enteral intolerance. Most commonly due to ileus or gastro-intestinal bleeding.

**Results**

Age, sex, preoperative co-morbidities, type and duration of ECMO were similar in 2 groups. Survivors had better preoperative SOFA scores , preoperative SAPS scores , and preoperative creatinine values.

All patients that survived were started on tube feeds within 2 days of ECMO initiation in contrast to 59% of non-survivors (P= 0.004).

88% of survivors versus 59% of non-survivors met adequate caloric feeding goals by day 3 (P= 0.04).

TPN was more frequently utilized in survivors in addition to tube feeds (50% vs 14%, p=0.009).

Pre-albumin values were similar between the 2 groups during the first 3 weeks, however were better in survivors by week 4 from ECMO initiation (20 mg/dl vs 14 mg/dl, p=0.001).

**Discussion**

We found that the patients who were started on feeds earlier and the patients who met calorie goals in the earlier stages after initiation of ECMO had lower mortality, although other factors may contribute to survival as well. Our data underscores the importance of establishing a goal oriented regimen for these patients, early in their course while on ECMO.

**Contact Information**

Nicholas Cavarocchi, MD.
Nicholas.Cavarocchi@jefferson.edu
Professor of Surgery
Division of Cardiothoracic Surgery
Thomas Jefferson University
Philadelphia, PA, USA.