

Optimum nutritional support in adults receiving vv-ECMO is possible but underfeeding is common, especially in those with more severe organ dysfunction

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Background



- The use of VV-ECMO for the treatment of severe respiratory failure in adults is increasing
- Limited evidence on nutritional support practices
- Underfeeding and GI intolerances are common¹⁻³

ELSO 2013 guidelines: “full energy and protein support is essential”

1. Scott *et al.* JPEN 2004; 28: 295-300
2. Lukas *et al.* Crit Care Resusc 2010; 12(4), 230-234
3. Bear *et al.* Intensive Care Med Exp 2015; 34:356-358

Aim

To describe the nutritional support practices in a single centre providing vv-ECMO (St Thomas' Hospital, London)

Methods

- Retrospective case review (Dec 2010 – Dec 2015)
- Energy and protein from all sources collected and compared with estimated requirements
 - Energy: 25-30 kcal/kg
 - Protein: minimum 1.2g/kg
- Adequate feeding considered **80-110% of target**
- Data on feed interruptions collected from electronic medical notes

Results – patient characteristics (n=203)

Characteristics	Result, median (IQR)
Age, year	44.0 (33.0–55.0)
Female:Male, n	91:112
BMI, kg/m ²	27.0 (23.7–33.0)
APACHE II score	18 (15–21)
SOFA score d1 admission	6 (4–11)
SOFA score d1 vv-ECMO	7 (4–11)
vv-ECMO duration, days	10.0 (7.0–15.0)
ICU duration, days	21.0 (15.0–33.0)
Estimated energy requirements, kcal/day	1800 (1600–2000)
Estimated protein requirements, g/day	87.0 (75.0–100.0)

Results – energy and protein intake

Figure 1: Overall Energy Intake

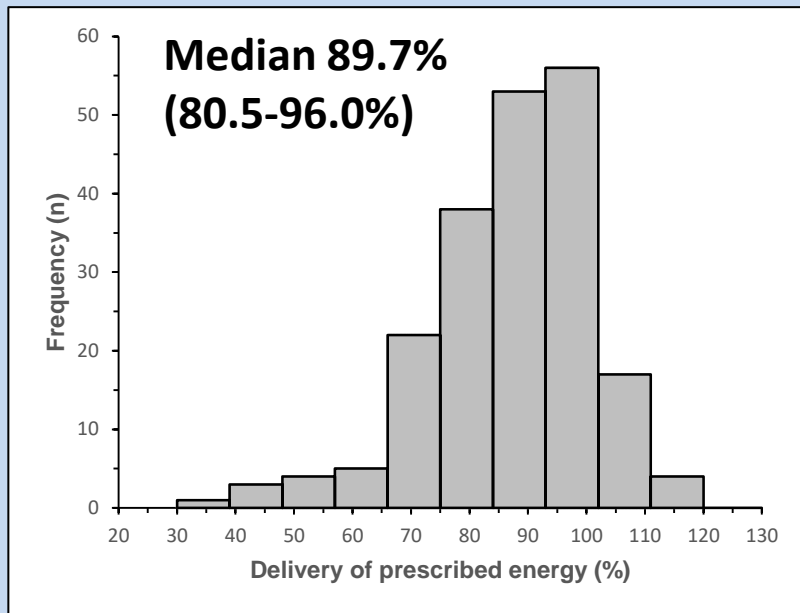
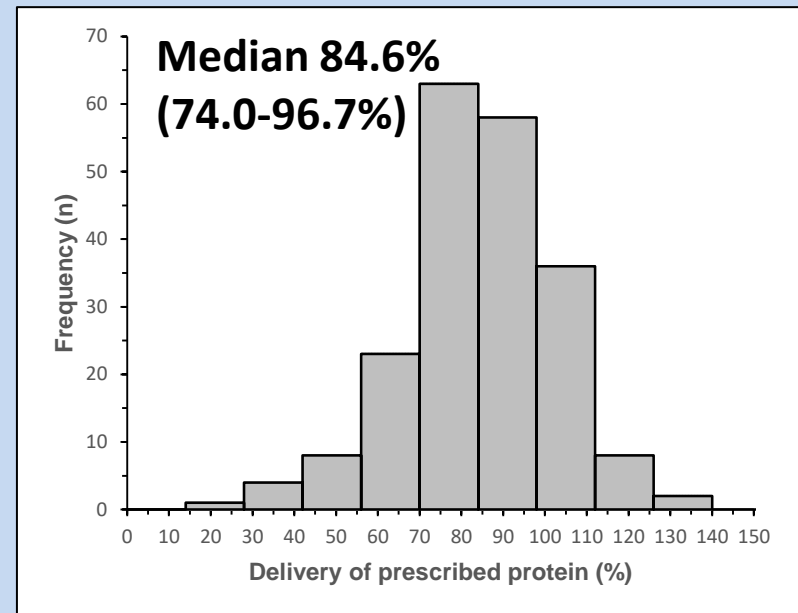


Figure 2: Overall Protein Intake



- Energy & protein **adequate** on 1228 (41.8%) days
- Energy & protein **inadequate** on 627 (22.4%) days

Results – disease severity scores and intake

	Energy			Protein		
	Adequate (80-110% target)	Underfeeding (<80% target)	p value (Mann- Whitney)	Adequate (80-110 % target)	Underfeeding (<80% target)	p value (Mann- Whitney)
No. of patients, n (%)	150 (73.9)	48 (23.6)		111 (54.7)	78 (38.4)	
Severity scores, median (IQR)						
APACHE II score	18.0 (15.0–20.0)	19.0 (15.0–22.8)	0.113	18.0 (14.0–20.0)	19.0 (16.0–22.0)	0.040
SOFA d1 admission	5.5 (4.0–11.0)	8.0 (4.0–11.0)	0.117	6.0 (4.0–11.0)	8.0 (4.0–12.0)	0.440
SOFA d1 vv-ECMO	7.0 (4.0–11.0)	9.0 (5.5–12.0)	0.026	7.0 (4.0–11.0)	8.5 (4.0–12.0)	0.201

Results - Feed interruptions and GI intolerance

- Feeding interruptions were common
 - Median 2 (IQR, 1–4) per patient
 - Median duration 9 (IQR, 3.0–33.0) hours
- Most common reasons
 - Fasting for procedures (72 patients, 39.1%)
 - GI intolerances (42 patients, 22.8%)

Results – Stool output

- Bowel management systems used in 171 patients (84.2%)
- Stool output > 500ml in 151 patients (74.4%)
- Likelihood of stool output > 500ml with **adequate** energy and protein (p=0.001 and p=0.010 respectively)

Conclusion & Recommendations

- The largest dataset on nutrition support in adult patients receiving vv-ECMO
- Adequate energy and protein intakes are possible
- Underfeeding still common, especially in those with more severe organ dysfunction / severity of illness
- Further research on the nutritional needs and the impact of underfeeding on outcomes in vv-ECMO is required



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