Capsule Summary

Nutrition: A Critical Factor in Clinical Outcomes of Critically ill COVID-19 patients

The clinical spectrum of COVID-19 illness ranges from mild to critically ill pneumonia, with severe cases admitted in the intensive care units (ICU) for prolonged periods of time. The majority of critically ill patients with severe pneumonia are elderly (>60 years old) with underlying comorbidities such as diabetes, cardiovascular disease, and chronic obstructive pulmonary diseases. Adequate caloric and protein supply (enteral or parenteral), among critically ill patients at a high risk of malnutrition, improve clinical outcomes and survival [1, 2].

Knowledge gap: Evaluation of the nutritional status and institution of appropriate nutritional support is recommended in critically ill COVID19 patients. However, clinical studies assessing the impact of nutrition risk and its association with clinical outcomes for COVID-19 patients are limited. A recent study by Zhao et al. in the Journal of Parenteral and Enteral nutrition addresses this knowledge gap [3].

Primary Objective

To evaluate the following in critically ill COVID-19 patients – (i) the clinical and nutritional characteristics, (ii) the relationship between nutrition risk and clinical outcomes.

Study design & Patient Characteristics

- Retrospective observational study, at Tongji Medical College, Wuhan, China.
- PCR positive severe and critically ill COVID-19 patients enrolled in the study.
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	Parameter Definitions
Severe COVID-19 (n = 346)	(1) Respiratory distress (respiratory rate≥30 breaths/min), (2) pulse oxygen saturation (≤93% on room air), & (3) low arterial oxygenation ratio (PaO2/fraction of inspired oxygen ≤300)
Critical COVID-19 (n = 67)	(1) respiratory failure requiring a form of mechanical ventilation; (2) shock; (3) complications with other organ failure that require monitoring and treatment in the intensive care unit (ICU).
Nutrition Risk Screening (NRS) score	As per the ESPEN AND CSPEN criteria [4, 5] NRS score ≥3 considered "at risk" for poor nutrition. NRS score ≥5 considered "very high risk" for poor nutrition

NRS distribution and nutrition support statistics among COVID-19 patients

NRS score	Severe COVOD-19 (n = 310)	Critical COVOD-19 (n = 61)
<3	29 (9%)	0
3-4	261 (84%)	23 (38%)
≥5	20 (7%)	38 (62%)

Major Interpretation: The majority of the Critically ill patients fall in the high-risk nutritional status category.

Patient statistics for the type of nutritional support

Supporting Treatment	NRS score < 3	NRS score ≥ 3	NRS score ≥ 3
	Severe cases (n=29)	Severe cases (n =281)	Critical cases (n =61)
Enteral Nutrition (EN)	6 (21%)	35 (13%)	14 (23%)
Parenteral Nutrition (PN)	1 (3%)	24 (9%)	19 (31%)
EN + PN	0	3 (1%)	5 (8%)
Probiotics	5 (17%)	94 (34%)	22 (36%)
Dietary supplements	6 (21%)	33 (12%)	6 (10%)

Major Interpretation: For patients with NRS score≥3, the ratio of those receiving nutrition support, EN, PN, or EN+PN among critically ill patients was higher than that among severely ill patients.

	Total cases	Hospital Stay (days)	Mortality
Severe cases	339	29.31±10.69	7 (2%)
Critical cases	64	38.68±11.15	30 (47%)
NRS <3	28	29.75±9.32	0
NRS 3-4	277	29.72±11.19	11 (4%)
NRS ≥ 5	56	36.97±11.30	24 (43%)

Major Interpretation:Increased mortality and hospital length of stay among critically ill patients and those with higher NRS score.

Conclusion

High nutrition risk among COVID-19 patients is directly proportional to worse outcomes, and such a nutrition risk requires active management

Information Source:
Zhao et al. Evaluation of Nutrition Risk and Its Association with Mortality Risk in Severely and Critically Ill COVID-19 Patients. Journal of Parenteral and Enteral Nutrition, 2021. DOI: 10.1002/jpen.1953. PMID: 32613660. The published manuscript can be accessed at: https://aspenjournals.onlinelibrary.wiley.com/doi/10.1002/jpen.1953

Disclaimer

References

1. *Wang, C.Y., et al., Targeted Energy Intake Is the Important Determinant of Clinical Outcomes in Medical Critically Ill Patients with High Nutrition Risk. Nutrients, 2018. 10(11).*
2. *Jung, Y.T., et al., Association of Inadequate Caloric Supplementation with 30-Day Mortality in Critically Ill Postoperative Patients with High Modified NUTRIC Score. Nutrients, 2018. 10(11).*
3. *Zhao, X., et al., Evaluation of Nutrition Risk and Its Association With Mortality Risk in Severely and Critically Ill COVID-19 Patients. JPEN J Parenter Enteral Nutr, 2021. 45(1): p. 32-42.*
4. *Kondrup, J., et al., Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. Clin Nutr, 2003. 22(3): p. 321-36.*
5. *Barazzoni, R., et al., ESPEN expert statements and practical guidance for nutrition*