

ENERGY REQUIREMENTS DURING THE LATE ACUTE STAGE OF CRITICAL ILLNESS: OBSERVATIONS FROM INDIRECT CALORIMETRY

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INTRODUCTION

It is well recognised that both over and under nutrition can negatively affect patient outcomes during critical illness¹. Indirect calorimetry (IC) is the Gold Standard for assessing resting energy expenditure (REE) in critically ill patients², however devices are not readily available in clinical practice. In the absence of IC, international ICU nutrition guidelines recommend aiming for below 70% of estimated needs from predictive equations during the late acute stage of critical illness (Day 3-7) to avoid potential overfeeding².

The aim of the current study is to describe IC REE results obtained during the late acute stage of critical illness and to compare to two predictive equations; the Penn State University Equation (PSU) and 20-25kcal/kg.

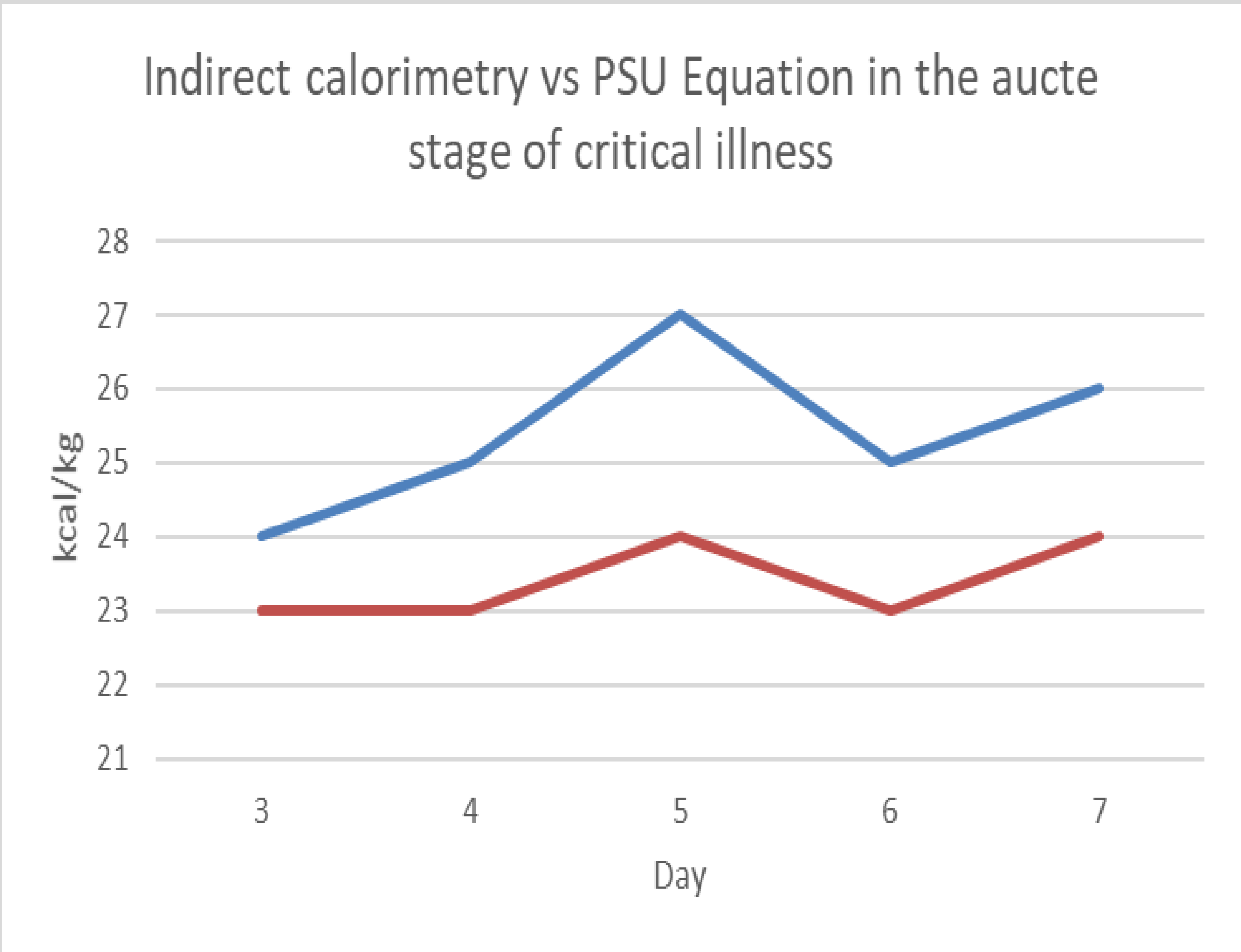
REASEARCH DESIGN

IC data were collected on all ventilated patients that met the inclusion criteria admitted to a critical care unit from June 2022 to August 2024. Measurements were taken as close as possible to day 3, 5 and 7 of ICU admission. Predictive equations were calculated on the same day as the IC measurement.

RESULTS

376 IC measurements are included in the results. The average IC measurement ranged from 24-27kcal/kg and the average PSU result ranged from 23-24kcal/kg during the late acute stage of critical illness.

58% of IC measurements were either above or below the recommended 20-25kcal/kg with the majority being above this weight based equation.



Day	Average				
	IC kcal	IC kcal/kg	PSU kcal	PSU kcal/kg	% kcal received
3 (n=157)	1875	24	1794	23	74
4 (n=53)	1944	25	1800	23	83
5 (n=68)	1977	27	1791	24	85
6 (n=53)	1870	25	1739	23	88
7 (n=45)	1943	26	1805	24	84

CONCLUSION

- IC results were higher than expected in the late acute phase of critical illness.
- Following best practice guidelines (aiming < 70% estimated needs)² may result in underfeeding in the late acute stage of critical illness.