

KORELASI PERHITUNGAN KEBUTUHAN KALORI PADA ANAK SAKIT KRITIS

DENGAN *PREDICTIVE EQUATION* DAN METODE *BIOELECTRICAL*

IMPEDANCE ANALYSIS

INTISARI

TUJUAN

Menilai korelasi antara perhitungan kebutuhan kalori pada anak sakit kritis dengan *predictive equation* (PE) dan metode *bioelectrical impedance analysis* (BIA)

METODE

Penelitian ini menggunakan desain penelitian *cross-sectional* dengan subyek anak sakit kritis yang dirawat di *pediatric intensive care unit* (PICU) RSUP Dr. Sardjito, Yogyakarta. Subyek penelitian sebanyak 50 pasien. Penelitian dilakukan pada bulan Juli-Agustus 2024. Perhitungan *resting energy expenditure* (REE)-PE dan pengukuran BMR-BIA dilakukan pada waktu bersamaan. Karakteristik dasar subyek ditelusuri dari rekam medis. *Predictive equations* yang digunakan adalah Schofield W, Caldwell-Kennedy, Schofield WH, WHO, dan Oxford *equation*, serta tabel Talbot W dan H. Korelasi REE-PE dan BMR-BIA dianalisis menggunakan uji korelasi Pearson, dan *Intraclass correlation coefficient* (ICC) dihitung untuk melihat *agreement* dan Bland-Altman plot untuk menentukan *limit of agreement* (LoA) antara REE-PE dan BMR-BIA.

HASIL

Terdapat korelasi positif kuat antara REE-PE dengan BMR-BIA. Rentang koefisien korelasi (r) antara 0,911 (95%IK, 0,858-0,948) (REE-Schofield W dengan BMR-BIA) sampai 0,960 (95%IK, 0,931-0,982) (REE-Caldwell Kennedy dengan BMR-BIA). Analisis *agreement* antara REE-PE dengan BMR-BIA menunjukkan *near complete agreement*. Nilai ICC tertinggi adalah REE Talbot W-BMR BIA, ICC=0,903 (95%IK, 0,830-0,945), diikuti REE-Caldwell Kennedy-BMR BIA (ICC=0,894), REE-Talbot H-BMR BIA (ICC=0,861), REE-Oxford-BMR BIA (ICC=0,858), REE-Schofield W-BMR BIA (ICC=0,851), REE-Schofield WH-BMR BIA (ICC=0,850) dan REE-WHO-BMR BIA (ICC=0,840). Bland-Altman plot menunjukkan perbedaan yang tidak signifikan antara REE-PE dan BMR-BIA, terutama pada Schofield W, Caldwell-Kennedy, Oxford *equation*, tabel Talbot W dan Talbot H.

SIMPULAN

Terdapat korelasi positif kuat dan *near complete agreement* antara perhitungan kebutuhan kalori pada anak sakit kritis dengan PE dan metode BIA. Nilai ICC antara REE-Talbot W dengan BMR-BIA adalah nilai ICC tertinggi. Schofield W, Caldwell-Kennedy, Oxford *equation*, tabel Talbot W dan H bisa digunakan untuk memperkirakan REE pada anak sakit kritis. Tabel Talbot W direkomendasikan sebagai metode paling ideal untuk tatalaksana nutrisi pasien di PICU negara berkembang seperti Indonesia.

KATA KUNCI

Predictive equation - BIA - *resting energy expenditure* - anak sakit kritis

CORRELATION BETWEEN PREDICTIVE EQUATIONS AND BIOELECTRICAL IMPEDANCE ANALYSIS FOR ESTIMATING CALORIC REQUIREMENTS IN CRITICALLY ILL CHILDREN

ABSTRACT

OBJECTIVE

This study investigated the correlation between caloric requirements in critically ill children using predictive equations (PE) and bioelectrical impedance analysis (BIA).

METHODS AND STUDY DESIGN

A cross-sectional design was applied to 50 patients treated in the PICU of Dr. Sardjito General Hospital, Yogyakarta, during July-August 2024. Resting energy expenditure (REE)-PE calculations and BMR-BIA measurements were conducted simultaneously. Predictive equations used included Schofield W, Caldwell-Kennedy, Schofield WH, WHO, Oxford, and Talbot W and H tables. Pearson correlation and Intraclass Correlation Coefficient (ICC) were used to analyze the correlation and agreement between REE-PE and BMR-BIA, with Bland-Altman plots determining the limits of agreement (LoA).

RESULTS

The results showed a strong positive correlation between REE-PE and BMR-BIA, with correlation coefficients ranging from $r=0.911$ to $r=0.960$. The highest correlation was found between REE-Caldwell Kennedy and BMR-BIA ($r=0.960$, 95%CI 0.931–0.982). Agreement analysis revealed near-complete agreement, with the highest ICC observed between REE-Talbot W and BMR-BIA (ICC=0.903, 95%CI 0.830–0.945), followed by REE-Caldwell Kennedy (ICC=0.894), REE-Talbot H (ICC=0.861), REE-Oxford (ICC=0.858), REE-Schofield W (ICC=0.851), REE-Schofield WH (ICC=0.850) and REE-WHO (ICC=0.840). Bland-Altman plots indicated insignificant differences between REE-PE and BMR-BIA, particularly for Schofield W, Caldwell-Kennedy, Oxford equations, and Talbot W and H tables.

CONCLUSION

There is a strong positive correlation and near-complete agreement between PE and BIA methods for estimating caloric requirements in critically ill children. The Talbot W table showed the highest ICC value and is recommended as the most ideal method for estimating caloric requirements in PICU patients in developing countries like Indonesia.

Keywords: Predictive equation, BIA, resting energy expenditure, critically ill children