Hubungan ekskresi kreatinin dalam urin 24 jam dengan Lean Body Mass (LBM)

Ermita Isfandiary Ibrahim, author

Abstrak

ABSTRAK
Ruang Lingkup dan Cara Penelitian: Penentuan LBM penting untuk penetapan dosis pemakaian obat-obatan, pemberian cairan, penentuan taraf metabolisme, pengaturan gizi pada masa pertumbuhan, penentuan kegemukan dan evaluasi kegemukan. Selama ini yang dipakai adalah Berat Badan Total (BBT), padahal jumlah lemak tubuh normal ialah 15 - 18% BBT pada pria dewasa atau 20 - 25% BBT pada wanita dewasa. Banyak cara untuk menentukan LBM antara lain ekskresi kreatinin urin 24 jam. Cara ini didasarkan atas pemikiran bahwa kreatinin berasal dari kreatin sedangkan ± 98% kreatin terdapat di otot yang merupakan bagian terbesar LBM.

Tujuan penelitian ialah mempelajari hubungan antara kreatinin urin 24 jam dengan LBM pada orang Indonesia. Bila hubungan ini cukup kuat akan dibuat suatu rumus prediksi LBM, rumus ini kemudian dibandingkan dengan 3 rumus lain yaitu rumus dari Forbes, Cheek dan Miller. Penelitian dilakukan pada 77 mahasiswa pria umur 20 - 23 tahun. LBM diperoleh dari BBT dikurangi lemak tubuh, sedangkan lemak tubuh diperoleh dengan memasukkan berat jenis tubuh (BJT diperoleh dengan densitometer) ke dalam rumus Siri. Kemudian dibuat persamaan regresi dengan LBM sebagai variabel dependen dan kreatinin urin 24 jam sebagai variabel independen.

Hasil dan Kesimpulan: Didapat hubungan cukup kuat antara kreatinin urin 24 jam dan LBM dengan r = 0,59. Rumus prediksi yang diperoleh ialah : LBM = 25,76 + 0,0145 Cr mg/24 jam. Nilai rata-rata dari selisih antara nilai LBM perhitungan dengan nilai prediksi LBM hasil rumus Peneliti, Forbes, Cheek, dan Miller berturutturut: 0,38%; 3,50%; 9,46% dan 6,95%. 'Standard error' masingmasing 0,85%; 1,08%; 1,13% dan 1,33%. Kisarannya berturut-turut: -19,66% sampai +20,69%; -19,53% sampai +23,83%; -14,19% sampai +31,93%; dan -6,73% sampai +-36,03%. Ditetapkan bahwa suatu rumus dapat diterima bila 95% subyek penelitian dengan nilai prediksi LBM berkisar ± 10%. Jumlah subyek penelitian yang masuk dalam kisaran ± 10% darn. LBM perhitungan, bila nilai LBM nya diprediksi dengan keempat rumus di atas berturut-turut: 65 orang = 84,42%; 55 orang = 71,43%; 39 orang = 50,65%; dan 38 orang = 49,35%. Mengingat tak ada satu pun rumus yang dapat diterima maka perlu dilakukan pengujian kembali rumus yang telah dibuat.
<hr><i>ABSTRACT
24-Hour Creatinine Excretion And Lean Body Mass (LBM)Scope and Method of Study: LBM is important in determining dosage of drugs, administration of fluids, metabolic rate, nutrition in growth and obesity. Total body weight (TBW) is usually used for this purpose, whereas in reality it includes total body fat which is 15-18% of TBW in males, and 20-25% in females. There are many ways of determining LBM, one of which utilizes 24-hour urinary creatinine excretion. The method is based on the fact that creatinine is formed from creatine, and about 98% of creatine can be found in muscles which makes up most of LBM. The aim

of this investigation is to study the correlation between 24-hour urinary creatinine excretion and LBM in Indonesians. If a strong correlation exists, a predictive formula will be constructed, which will then be compared with 3 other formulae from Forbes, Cheek, and Miller.

The study was done on 77 male students aged 20-23 years. LBM was calculated from TBW minus body fat; body fat was derived from Siri formula using Total Body Density measured with a densitometry. A regression equation was made with LBM as dependent variable and 24-hour urinary creatinine as independent variable.

Findings and Conclusions: A strong correlation exists between 24-hr urinary creatinine excretion and LBM with r = 0.59. The predictive formula obtained is: LBM (kg) = 25.76 + 0.0145 Cr mg/24h. The mean difference between predicted LBM in this investigation, LBM obtained from Forbes, Cheek, Miller, and computed LBM are, respectively, 0.38%, 3.50%, 9.46%, and 6.95%, with standard error of 0.85%, 1.08%, 1.13% and 1.33%; ranging from -19.66% to +20.69%, -19.53% to +23.83%, -14.19% to +31.93%, and' -6.73% to 36.03%. An equation was accepted if 95% of all LBM predicted from that equation fell within ± 10% of the calculated LBM. Using subjects in this investigation, the amount of LBM obtained from the 4 mentioned equations that fell within ± 10 % of calculated LBM are, respectively, 65 subjects (84.42%), 55 subjects {71.43%), 39 subjects (50.65%), and 38 subjects (49.35%). Since none of the above equation can Be satisfactorily accepted, the LBM pre-diction equation obtained from this investigation needs to be tested further.</i>