

Pengaruh diet rendah kalori seimbang terhadap resting energy expenditure dan kadar t3 serum perempuan obes = Effects of balanced low calorie diet on resting energy expenditure and serum T3 levels of obese females

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Abstrak

Tujuan : Mengetahui keadaan metabolisme penderita obesitas setelah menjalani diet rendah kalori seimbang selama 14 hari, dengan mengukur resting energy expenditure (REE) dan kadar T3 serum

Tempat : Rumah Sakit Sumber Waras, Jakarta Barat

Metodologi: Dilakukan penelitian pada 37 orang perempuan obes yang memenuhi kriteria penerimaan dan penolakan serta bersedia mengikuti penelitian ini. Penelitian ini merupakan studi quasi eksperimental pra dan pasca perlakuan. Setiap subjek menjalani diet rendah kalori seimbang 1000 kkal selama 14 hari. Pemeriksaan antropometri, REE dan kadar T3 serum dilakukan pada awal, hari ke 7 dan akhir perlakuan. REE diukur dengan kalorimetri tak langsung (REE ukur) dan dihitung dengan menggunakan persamaan Harris-Benedict (REE hitung).

Hasil: Pada akhir perlakuan terjadi penurunan yang bermakna ($p < 0,05$) pada berat badan, massa lemak, massa bebas lemak, REE ukur dan REE hitung masing-masing dari $71,22 \pm 8,63$ kg menjadi $69,15 \pm 8,37$ kg (penurunan 2,9%), dari $35,32 \pm 2,58\%$ menjadi $33,94,58\%$ (penurunan 1,38%), dari $45,96 \pm 4,89$ kg menjadi $45,54 \pm 4,82$ kg (penurunan 0,92%), dari $1815,08 \pm 22,37$ kkal menjadi $1718,97 \pm 269,50$ kkal (penurunan 5,29%) dan dari $1428,07 \pm 84,02$ kkal menjadi $1408,25 \pm 1,52$ kkal (penurunan 1,39%). Penurunan kadar T3 serum yang bermakna terjadi pada hari ke 7 ($p = 0,001$), dari $0,9005 \pm 0,1530$ ng/mL menjadi $0,8362 \pm 0,1611$ mg/mL (penurunan 7,1%). Pada akhir penelitian, dibandingkan dengan hari ke 7, terjadi peningkatan T3 yang tidak bermakna. Pada hari ke 7 terdapat korelasi positif bermakna ($r = 0,349$; $p = 0,034$) antara perubahan REE ukur dengan perubahan T3. Pada hari ke 15 terdapat korelasi positif bermakna ($r = 0,401$; $p = 0,014$) antara perubahan REE ukur dengan perubahan massa bebas lemak. Perubahan T3 pada hari ke 7 mempunyai korelasi positif bermakna ($r = 0,385$; $p = 0,019$) dengan perubahan berat badan pada minggu pertama dan dengan perubahan massa bebas lemak pada minggu pertama ($r = 0,345$; $p = 0,036$). Pada penurunan berat badan sebesar 2,9% terdapat penurunan REE ukur dan REE hitung masing-masing 5,29% dan 1,39%. Rata-rata REE ukur lebih besar 27% daripada REE hitung.

Kesimpulan : Setelah terjadi penurunan berat badan dengan diet rendah kalori seimbang, penderita obesitas berada dalam kondisi hipometabolisme yang ditandai dengan penurunan REE ukur, REE hitung dan kadar T3 serum.

Objective: to determine the metabolic state of obese females after treatment with balanced low-calorie diet for 14 days by measuring resting energy expenditure (REE) and serum T3 level as indicators.

Location : Sumber Waras hospital , West Jakarta

Methods : The study was carried out on 37 obese females who have been recruited based on inclusion and exclusion criteria. This study is a quasi experimental study with a pre and posttest treatment design. Every subject received a balanced low-calorie diet (LCD) of 1000 kcal/day for 14 days. Anthropometric measurements, REE and serum T3 levels were examined at the beginning, at day 7 and at the end of study. REE were measured and calculated by indirect calorimetry (measured-REE) and using Harris-Benedict equation (calculated-REE) respectively.

Result : Balanced LCD given for 14 days significantly ($p < 0.05$) decreased body weight (BW) , fat mass, fat free mass, measured-REE and calculated-REE from 71.22 ± 8.63 kg to 69.15 ± 8.37 kg (decreased 2,9%), from $35.32.58\%$ to $33.94 \pm 2.58\%$ (1,38%), from 45.96 ± 4.89 kg to 45.54 ± 4.82 kg (0,92%), from $1815.0822.37$ kcal to 1718.97 ± 269.50 kcal (5,29%), and from $1428,7 \pm 84.02$ kcal to 1408.25 ± 81.52 kcal (1,39%) respectively. There was a significant decrease ($p = 0.001$) in serum T3 level at day 7 from 0.9005 ± 0.1530 ng/mL to $0.836210.1611$ ng/mL (decrease 7,1%). At the end of the study, serum T3 levels increased not significantly compared to day 7. At day 7, there was a significant positive correlation ($r = 0.349$; $p = 0.034$) between the change in measured-REE and the change in serum T3 levels. At day 15, a significant positive correlation ($r = 0.401$; $p = 0.014$) was found between the change in measured-REE and the change in fat free mass. The changed of serum T3 levels at day 7 had significant positive correlation ($r = 0,385$; $p = 0,019$) with the changed of BW in the first week. The changed of serum T3 levels at day 7 had significant positive correlation ($r = 0,345$; $p = 0,036$) with the changed of fat free mass in the first week. After reduction of BW by 2.9%, there was a decrease of measured-REE and calculated-REE, 5.29% and 1.39%, respectively. The measured-REE was 27% higher than calculated-REE.

Conclusion : Weight-reduced obese subjects with balanced LCD were in hypometabolic state indicated by a reduction in measured and calculated-REE, and serum T3 levels.