

Body composition and psychological correlates of resting energy expenditure and activity in adolescent girls with anorexia nervosa.

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Background: Anorexia Nervosa (AN) triggers profound metabolic and psychological adaptations during adolescence. This study investigated the relationships between resting energy expenditure (REE), body composition, physical activity (PA), and specific psychometric phenotypes in adolescent girls with AN compared to healthy, normal-weight (NW) peers.

Methods: sixteen adolescent girls with severe AN (16.1 ± 1.2 year) and 16 age-matched NW controls (15.6 ± 1.5 year) underwent clinical evaluations: anthropometry, bioelectrical impedance analysis for fat-free mass (FFM) and fat mass (FM), indirect calorimetry for REE, the short-form International Physical Activity Questionnaire (IPAQ), and the Eating Disorder Inventory-3 (EDI-3).

Results: girls with AN exhibited significantly lower BMI (- 20.3%, ES: 1.94, large), FFM (- 18.3%, ES: 1.92, large), and FM (- 25.7%, ES: 0.79, medium) than controls ($p < 0.003$). Absolute REE was drastically lower (- 40.4%, ES: 3.53, large, $p < 0.001$). This hypometabolic state persisted after adjusting REE for body weight (- 34.9%) or FFM (- 32.5%, $p < 0.001$), consistent with adaptive thermogenesis. The AN group displayed resting hypotension and 79.0% (ES: 1.84, large, $p < 0.001$) lower total PA energy expenditure due to a lack of structured moderate-to-vigorous exercise; however, walking expenditure did not differ. Psychometrically, the AN cohort showed significantly higher ($p < 0.001$) values for drive for thinness (+316.9%, ES: 3.16, large), body dissatisfaction (+232.3%, ES: 2.30, large), and severe general psychological maladjustment, including higher interoceptive deficits (+148.2%, ES: 1.26, large).

Conclusions: adolescents with AN exhibit profound metabolic suppression via adaptive thermogenesis, together with an apparent dissociation between walking-related activity and hypotension. Since cognitive distortions and distress vary independently of anthropometric severity, clinical recovery must extend beyond nutritional rehabilitation; targeted psychotherapy may therefore be necessary to address persistent psychological maladjustment.

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