early GH (p = 0.004), and late GH (p = 0.037) improved significantly. Basal estradiol (p = 0.0002) and nocturnal urinary catecholamines, (p = 0.043) reduced, while testosterone (p = 0.014), testosterone:estradiol (T:E) ratio (p = 0.0005), freeT3 (p = 0.043), IGF-1 (p = 0.003), and cortisol awakening response (CAR) (p = 0.001) increased significantly. All basal parameters and early responses to ITT normalized, when compared to healthy athletes. Basal metabolic rate, fat oxidation, body fat, muscle mass, and hydration status had partial but non-significant improvements. Conclusion: After 12 weeks, athletes affected by actual OTS demonstrated substantial improvements, remarkably IGF-1, freeT3, CAR, testosterone, estradiol testosterone:estradiol ratio, CK and catecholamines, and early cortisol, early prolactin, and overall GH responses to stimulations.

Adipose Tissue, Appetite, and Obesity

OBESITY TREATMENT: GUT HORMONES, DRUG THERAPY, BARIATRIC SURGERY AND DIET

Novel Paradoxical Markers of Weight Loss: Is the Worse Actually the Better? a Retrospectiveanalysisof 1,567 Patientswith Obesity With Successful Clinical Weight-Loss Approaches.

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Background: Obesity is a chronic, multi-factorial, and relapsing disorder that has been reported to be a risk factor to more than 200 diseases, among which the majority is direct- or indirectly triggered by the metabolic abnormalities induced by excessive body fat. Indeed, patients with obesity tend to disclose multiple alterations of metabolic markers, which tend to improve with weight loss. Despite the multiple dysfunctions extensively in this population, only mandatory biochemical exams are usually ordered, likely due to limitations in cost and lack of cost-effectiveness, since the majority of the parameters typically altered in obesity does not drive therapeutic choices or influence in an individual-based evaluation.We developed a protocol for obesity treatment that includes a thorough analysis and follow up of the biochemical parameters of patients with obesity, including more than 50 parameters, for more precise diagnosis and response to treatments. Among these parameters, we identified unexpected changes, including some that would initially be related to increased cardiovascular risk or worse prognosis when in an usual context, but which could peculiarly indicate successfulness of weight loss, since these parameters tend to return to normal levels after a period in the new body weight. Our objective is to identify whether these paradoxical changes in biomarkers are linearly correlated with body weight loss, fat loss, mass loss, or whether they were related to the use of any anti-obesity drug. **Methods:** In a retrospective cohort of 1,567 patients that underwent a clinical weight loss treatment for obesity in a obesity center (Corpometria Institute, Brasília, DF, Brazil), we performed a linear association analysis between body weight and body fat (air displacement pletismography - Bod Pod, CosMed, USA) and 65 parameters, including hormonal, metabolic, inflammatory, and immunologic parameters. We also adjusted for the use of anti-obesity drugs. **Results:** Homocysteine and triglycerides were identified to increase linearly according to the amount of weight loss (r = -0.77) and fat loss (r = -0.85), but not due to the use of any drug. Folic acid decrease was directly related to fat loss (r = 0.81). Additional findings include more significant decrease of ApoB, compared to LDLc, decreases of GGT, ALT, CRP, ESR, neutrophils, ferritin, fibrinogen, PTH, free T3, uric acid, a and temporary decrease of ApoA and HDLc, all related with body fat loss. **Conclusions:** Increase of homocysteine resulted from decreased folic acid metabolism, and increased triglycerides may be indirect markers of lipolysis, as no other plausible mechanism could explain these findings.

Reproductive Endocrinology

REPRODUCTIVE ENDOCRINOLOGY: REPRODUCTIVE FUNCTION AND DYSFUNCTION ON DEVELOPMENT

Cyclic Progesterone Therapy for Androgenic Polycystic Ovary Syndrome (PCOS) - A Systematic Review of the Literature

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Women living with androgenic PCOS (WLWP) experience unpredictable oligomenorrhea[1] and are at increased risk for endometrial cancer[2]. Oral micronized progesterone (OMP) given cyclically (14 days/cycle or 4 weeks, Cyclic OMP), in luteal phase doses[3] (300 mg at bedtime) as a "luteal phase replacement" therapy would be likely to effectively treat both. In addition, evidence suggests PCOS is causally related to rapid pulsing of GnRH and LH [4]; OMP normalizes LH pulsatility if androgen levels are not elevated [4]. Previous searches did not find progesterone therapy
for PCOS [5]. Our research question: Does the peer-reviewed literature provide evidence for prescribing cyclic progesterone therapy in PCOS? Literature search methods used Medline (Ovid) and PubMed for published articles. Our search terms were: "polycystic ovary syndrome", "androgenic PCOS", and, "micronized progesterone." We sought publications with eligible women participants having androgenic PCOS, drug exposures (cyclic
OMP, vaginal progesterone, and in varying doses and durations) and specific outcomes (biochemical or patient-reported data or both) in all languages. We excluded reviews and practice guidelines but searched bibliographies for missed citations. Results discovered 18 articles in combined Medline (n=6) and PubMed (12) searches. After excluding duplicates, articles on estradiol (E2) alone E2 with OMP therapy, five eligible articles remained. We read all in full detail.
Progesterone therapy was beneficial for WLWP as, even in sub-therapeutic doses (<300 mg at bedtime) and in cycles of too short durations (<14 days), it decreased luteinizing hormone (LH) [6,7] and total testosterone [7] levels. Vaginal progesterone (200 mg, b.i.d for 2 to 12 weeks) added to letrozole ovulation induction increased the pregnancy rate from 0 to 21% [8]. Although present data suggest Cyclic